Developing a Model of Communication Competence for Organizations

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ABSTRACT

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The general purpose of this paper is to synthesize and refine previous work on communication competence into a more useful conceptualization of the construct, and show the relevance and utility of applying this construct to the organizational context.

Synthesizing and refining previous work resulted in the proposed model of communication competence, which consists of nine specific cognitive and behavioral skill dimensions and two motivational outcome dimensions. These skills and motivators are accounted for by the cognitive skills component, the behavioral skills component, and the motivation component. A discussion of the interaction and relationships among these components is presented.

This paper also demonstrates the relevance and utility of applying the communication competence construct to the organizational context. This is accomplished by showing the relevance of the proposed skills and motivators to organizational communicators, and by showing the utility of the proposed conceptualization for assessing communication competence in organizations.

A study is presented that tests the proposed skill and motivational dimensions. This study also contributes to the construct validity of the measures by

conceptualizing and empirically testing the nomothetic network of the proposed communication competence model. This network consists of communication apprehension, role ambiguity, job identification, communication satisfaction, and empathy-communicative responsiveness. The study took place in a Midwestern automobile manufacturing plant. Results illustrated that the 11 dimensions of the model, although descriptive of competent communicators at this organization, were not distinct suggesting that the proposed dimensions are part of a unidimensional construct of communication competence. These results and findings regarding the nomothetic network contributed to the validation of the construct.

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Here's to all my Frieeeends. And here's to all my teachers. Without them both, I never would have made it through. Your support, guidance, and encouragement were the bright spots in an otherwise dark and dismal process. With the help of my friends and teachers, I learned, I cried, and I persevered. Thank you all.

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INTRODUCTION

Purpose

The general purpose of this paper is to synthesize and refine previous work on communication competence into a more useful conceptualization, and to show the relevance and utility of applying this construct in an organizational context. This purpose suggests a number of goals. The first goal of this paper is to synthesize previous work, refine, and absorb the most useful elements into a comprehensive model of communication competence. This is an attempt to clarify what McCroskey calls the "elusive construct" of communication competence and reflects Spitzberg and Hecht's (1984) "need to develop a model of competent interaction that can integrate extant approaches and findings" (p. 575). Clarifying this elusive construct means focusing exclusively on communication competence and not attempting to account for elements associated with other types of competence such as social competence.

Although any consideration of a communication construct suggests that one address both content and process issues, it is important to emphasize that this study is primarily concerned with the content of communication competence. This means that this study's objective is to develop and test a taxonomy of nine communication skills associated with communication competence as well as develop and test a taxonomy of two motivational outcomes that drive a person to communicate competently. Determining the content of communication competence is an essential

first step in fully understanding this construct. Once the proposed content of this construct has been supported, it would then be possible in future research to address the process of communication competence that is discussed throughout this paper.

The second goal of this paper is to show the relevance and utility of applying the communication competence construct to the organizational context. This is accomplished by showing the relevance of the proposed communication skills and motivators to organizational communicators, and by showing the utility of the proposed conceptualization for assessing communication competence in an organization. This illustrates the value of applying this construct to organizations since it could provide a communication needs assessment. This could be used as a basis for training efforts designed to improve employee's communication competence. It is especially important to accomplish this goal since "it has become increasingly apparent that organizations will not be effective in what they set out to accomplish unless a sufficient number of members have the ability to communicate effectively" (Sypher, 1984, p. 103).

The third goal is to test the proposed relationships among the proposed dimensions and between the communication competence dimensions and variables within its proposed nomothetic network. This would help determine the construct validity of the proposed measures and contribute to validating the proposed conceputalization of communication competence.

Accomplishing the above goals would not only benefit the academic field by clarifying the content of the communication competence construct, but would also benefit organizations by identifying essential skills that are necessary to

communicate competently and offer a technique for assessing those skills. The first step in accomplishing these goals is to define what is meant by communication competence, which is but one of many types of competence studied throughout the literature. Following the discussion on the types of competence, the chapter continues with a discussion of: previous definitions and the proposed definition of communication competence; previous models and the proposed model of competence which includes a detailed discussion of each of the three components, their interactions and relationships; and a discussion of the construct's nomothetic network. These sections all provide a review of the literature and attempt to develop the communication competence construct which, as mentioned, is distinct from other types of competence.

Types of Competence

Spitzberg and Cupach (1984) identify four basic types of competence: social, fundamental, interpersonal, and communication. Social competence is the ability of a person to act socially appropriate in a given situation (Brandt, 1978; Spitzberg & Cupach, 1984). Typically, social competence theorists look at a trait or set of traits that allow a person to function within certain social role relationships or perform certain roles for the purpose of achieving specific outcomes (Spitzberg & Cupach, 1984). Thus, it is assumed that a socially competent person is one who is able to appropriately use a set of traits to perform a social role and achieve specific outcomes in a given situation.

Fundamental competence is the ability of a person to adapt effectively to the surrounding environment over time (see Connolly & Brunner, 1974; Coulter & Morrow, 1978; Smith and Greenberg, 1979). Most fundamental competence

theorists are concerned with the ability of a person to survive, grow, thrive, and be psychologically well adjusted while interacting with a changing physical and social environment (Spitzberg and Cupach, 1984). Thus, it is assumed that a fundamentally competent person is one who successfully and continually adapts to a volatile environment.

Interpersonal competence is the ability of a person to have some desired effect on people by integrating one's goals with those of others and collaborating in their realization while establishing and maintaining the desired identities both of self and other (see Bochner & Kelly, 1974; Wiemann & Backlund, 1980). This has led most interpersonal competence theorists to focus on the traits, or psychological processes, that enable a person to strategically achieve interpersonal goals, solve interpersonal problems, or be effective in an interpersonal interaction (Spitzberg & Cupach, 1984). Thus, it is assumed that an interpersonally competent person is one who strategically interacts with others for the purposes of solving interpersonal problems or attaining self and other goals.

The fourth type of competence is communication competence. Most communication competence theorists (e.g. Pavitt, 1989; Cegala, 1986; Spitzberg, 1983) consider this to be a person's ability to engage in appropriate communicative behavior in a given context. This suggests that people have a knowledge of what is appropriate in a given context and the skills necessary to communicate effectively. This type of competence is considered to be message-focused, since it is concerned with the ability to adapt messages to the interaction context, usually for the purpose of attaining some outcome (Spitzberg & Cupach, 1984). Thus, it is assumed that a

communicatively competent person is one who is able to communicate messages appropriately in a given context.

Understanding this particular type of competence is important since a number of authors (e.g. Fitts, 1970; Ruben, 1976; Trower, Bryant, & Argyle, 1978) point out that "competent communication facilitates a wide range of social and occupational success" (Spitzberg & Cupach, 1984, p. 42). Yet, little has been done to develop a specific construct of communicator competence, one which focuses explicitly on communication rather than on more encompassing social or interpersonal characteristics (Monge, Bachman, Dillard, & Eisenberg, 1982). For example, work by such authors as Spitzberg (1983) and Wiemann (1977) tend to confound interpersonal competence with communication competence by addressing interpersonal concerns instead of focusing specifically on communication. This paper attempts to focus exclusively on communication competence and not cloud the conceptualization by including elements of other types of competence. This reflects the previously mentioned purpose of refining the construct of communication competence.

Previous Definitions of Communication Competence

The first step in refining communication competence is to define the term. This is not easy since there is no agreed-upon definition of communication competence, much less an accepted general theory of competence (Cegala, 1986; Monge et al., 1982).

One reason that previous definitions have been so disparate is because they are not exclusively communication-oriented but instead are emphasizing a wide range of interpersonal and social abilities such as empathy, behavioral flexibility, and

social relaxation. This reflects previous scholarly tendencies (e.g., Spitzberg) to combine various types of competence instead of focusing on one type and clearly describing its salient characteristics.

Another reason that there is such a diversity of definitions is that an author will pick a particular concept/s that he/she considers salient to the construct of communication competence and then emphasize that concept. For example, Spitzberg (1983) emphasizes the importance of the appropriateness of a person's behavior; McCroskey (1982) emphasizes knowledge; Wiemann (1977) emphasizes the use of communicative behaviors; Spitzberg (1983) emphasizes goal orientation; and Phillips (1984) points to the importance of incorporating context into a definition of communication competence.

Although other concepts have also been used (e.g. maintaining face and line [Wiemann, 1977]), it is argued that the above are the most conceptually relevant to the construct of communication competence. Thus, the criterion for including a concept in the definition of communication competence is that it must be conceptually relevant and important to the construct. Each of the above concepts meets this criterion, as will be shown.

Appropriateness is an important construct because it captures one of the key purposes of communicating competently-to respond appropriately. This means that a response is appropriate to the context, relationship, topic, and other. Appropriate communication avoids violating contextual and interpersonal rules and is equated with effectiveness (e.g., Wiemann, 1977; Cupach & Spitzberg, 1983). Hymes (1974) considers this to be an integral part of any complete theory of competence. This is why nearly all treatments of competence discuss it in terms of appropriate behavior

(e.g., Allen & Brown, 1976; Applegate & Leichty, 1984; Foote & Cottrell, 1955; Cegala, 1986; etc.). Athough appropriateness is considered important to the definition of competence, a number of authors (e.g., McCroskey, 1982; Phillips, 1984) suggest that one can't respond appropriately without having knowledge of an appropriate response.

McCroskey (1982) emphasizes the importance of knowledge by defining competence as the "ability to demonstrate knowledge of the appropriate communicative behavior." This means that a person has knowledge of the situation, culture, self, other, and social and interpersonal rules. McCroskey (1982) considers knowledge to be one of the cognitive characteristics essential to competent communication and the foundation for the cognitive component. This is reflected by advocates of the cognitive perspective who conceive of competence as a mental phenomenon and argue that an understanding of the cognitive aspects of communication is essential for a complete understanding of the construct (Wiemann & Backlund 1980).

Yet having knowledge is not enough to define communication competence; it is also important to include communicative behavior. Thus, many authors (e.g., Wiemann, 1977) consider communicative behaviors to be conceptually relevant. For example, Jones et al. (1986) note that a competent communicator has the ability "to choose among available communicative behaviors." These include "the speaking and hearing capabilities of a person" (Hymes, 1971). Wiemann and Backlund (1980) point out that advocates of the behavioral perspective would emphasize the importance of communicative behaviors in defining competence since they view

competence as "a repertoire of (behavioral) skills appropriate to a variety of relationships and contexts" (p. 188).

The reason for choosing particular communicative behaviors is to achieve some goal or to attain some outcome. Thus, outcomes are also relevant to a definition of communication competence. Outcomes are emphasized by Spitzberg (1983), who claims that competent communication is best conceived as interaction which accomplishes personal objectives. He claims that effective communication is instrumental in the attainment of rewards (Spitzberg, 1983). Many other authors (e.g., Parks, 1985; Miller & Steinberg, 1975) suggest that rewards are often what is motivating the person to communicate competently.

Of course, the available outcomes are relative to the context in which an interaction occurs. This is why almost every author identifies the importance of considering communication competence within a particular context (e.g., an organizational context). For example, Phillips (1984) considers that competence suggests an understanding and ability to meet situational requirements. This means that it is important to understand the context, and regulative rules governing the situation (Spitzberg, 1983), so that one can adapt to the constraints of the situation (Wieman, 1977; Duran, 1983).

Proposed Definition of Communication Competence

As can be seen, all of the above constructs are important to a definition of communication competence and meet the criteria of conceptual relevance. Since the purpose of this paper is to synthesize and absorb the most useful elements of previous conceptualizations, it is argued here that a useful definition should incorporate all of the above constructs. Thus, communication competence is

defined here as the ability to appropriately use one's cognitive and behavioral communicative abilities to achieve some outcome in a specific context. This definition is useful because it improves on previous definitions by capturing all the most salient elements: appropriateness, knowledge (cognitive ability), communicative behaviors (behavioral abilities), outcome, and context. It also accounts for both the cognitive and behavioral components which Rubin (1985) notes is integral to most definitions.

In addition, this definition lays the groundwork for developing a model of communication competence. Phillips (1984) notes that one standard for judging definitions of competence should be their effectiveness at either building theory or solving technical problems of training. As will be shown in this paper, this definition and the accompanying model meets this standard.

Previous Models of Communication Competence

Before describing the model derived from this definition, it is important to review some of the previous efforts to create models of communication competence. A review of the literature reveals that primarily three models exist that are communication competence or communication/interpersonal competence models. These include Spitzberg's (1983), McCroskey's (1982), and Wiemann's (1977). Each of these models will be presented and relevant concerns discussed. The proposed model will then be presented and shown to overcome concerns mentioned with the previous models.

Spitzberg's Model of Relational Competence

Spitzberg (1983) in conjunction with a number of others (e.g., Cupach, Hecht, and Brunner) developed a model of what he calls relational competence, which is a

combination of interpersonal and communication competence. This model includes five components: motivation, knowledge, skills, context, and outcomes (Spitzberg & Cupach, 1984). According to Spitzberg and Hecht (1984) motivation is a "function of rewards and costs in a given conversational context with a specific other" (p. 576). Knowledge is conceptualized as knowledge of context, other and subject. Skills are considered the successful performance of a communicative behavior and are described using five skill dimensions. Context concerns the interaction factors of culture, setting, situation, and relationships. And finally, outcomes are considered to be functional indicators of a set of criteria for determining communication competence (e.g. communication satisfaction, interpersonal attraction, trust). On the basis of this conceptualization, Spitzberg considers a competent communicator to be one whom is perceived by self and other to be competent in a given situation. Thus, competence is an "interpersonal impression" based on one's perception of the other's communicative performance in a context. This reflects the contextual nature of the model. In addition, Spitzberg argues that motivation, knowledge, and skill are all related and integral to each other with communication competence providing a useful umbrella under which to shelter these components.

Although Spitzberg's model is a comprehensive model, there are a number of concerns with considering this a communication competence model which Spitzberg does. Of course, the obvious concern is that this model is intended to be an interpersonal or relational model of competence and is not communication-specific. This suggests that Spitzberg's model is concerned with more than just the exchange of messages in an interaction. It is also concerned with interpersonal issues such as a concern for other satisfaction and a desire to achieve interpersonal goals. Thus, it

captures elements of interpersonal competence as well as communication competence.

Another concern with this model is that the author does not fully develop the motivation or cognitive component but instead relies on more abstract descriptions to explain these components. For example, the cognitive component is described generally as knowledge of other, conversation, and topic (see Spitzberg & Hecht, 1984). More development seems necessary for these components (e.g., what kinds of knowledge about the other is important) as well as a description of how these components interact.

McCroskey's Model of Communication Competence

McCroskey (1982) uses a pedagogical approach to competence and considers communication competence to be a learning process that bears directly on ultimate behavioral choices. McCroskey (1982) identifies three components: a cognitive, behavioral, and motivational component. The cognitive or "cognitive communication learning" component accounts for the person's knowledge and understanding and "would include learning what are the available means, how they have been employed in various situations in the past, and being able to determine which ones have the highest probability of success in a given situation" (McCroskey, 1982, p. 5). The behavioral component or "psycho-motor communication learning" accounts for a person's behavioral skills and includes such things as the ability to speak without excessive pauses. McCroskey considers the motivational component to consist of affective communication learning which are the attitudes and feelings of the learner about his/her knowledge and behaviors. This accounts for the positive or negative affect that one attaches to a particular knowledge or skill. For example, a person

may master the skill of being assertive but find that when engaging in that behavior a negative outcome is produced, thus lowering his/her motivation to use that skill in the future (McCroskey, 1982).

Although McCroskey's model is more communication-specific than Spitzberg's, there are still some concerns as to the value of this model as a communication competence model. One major concern is that McCroskey does not develop his components adequately (e.g., provide specific dimensions or skills that are characteristic of his components). This makes it difficult to apply, use, or test this model since the components do not contain specific skills or knowledge dimensions which can be tested. In addition, McCroskey does not explain the motivation process beyond the description presented above, nor provide an indication of what types of positive or negative outcomes affect motivation. A final concern is that he does not fully explain the interaction of the components.

Wiemann's Model of Communication Competence

The final model to be presented is Wiemann's (1977). Although described as a communication competence model, this model is similar to Spitzberg's in that it also accounts for elements of interpersonal competence which is reflected by the communicator's ability to help "others 'save face'". Wiemann, as with the previous authors, notes the importance of cognitive and behavioral components but does not include them in his model. Instead, he uses five dimensions to account for competence which include: interaction management, affiliation/support, behavioral flexibility, empathy, and social relaxation.

There are a number of concerns that limit the use of this model as a model of communication competence. First, it is not specific to communication competence

since it also emphasizes interpersonal skills. This is reflected by the affiliation/support and social relaxation dimensions. In addition, Wiemann notes that a model should include cognitive and behavioral components but does not explain how these components are accounted for by his model. He also does not conceptually develop the dimensions, but instead relies on his operationalizations (e.g., eye blinks, head nods, etc.) to explain the conceptual content of these dimensions. As can be seen, each of the previous models has certain weaknesses, which the proposed model will attempt to overcome.

Yet, it is important to note that the primary components of these models are a cognitive component, behavioral component, and a motivational component. This is supported by "scholars who recognize the importance of all three components to communication" (Cegala, 1986, p. 6), and by interactants who also perceive that knowledge, conversational skills, and motivation are integral to competent interaction (Spitzberg & Cupach, 1984). Using these three components is "valuable because it directs us to the types of behaviors which make a difference in perceptions of competence" (Wiemann, 1977, p. 210). Yet, Cegala (1986) is concerned that "what is lacking is a clear articulation of the conceptual and operational facets of these components and how they are related" (p. 6). The proposed model attempts to address Cegala's concern.

Proposed Model of Communication Competence

In creating the proposed model, an attempt was made to synthesize and refine previous work in communication competence. Thus, the proposed model of communication competence is communication-specific and consists of three components which are fully developed and contain a number of dimensions. The

first component is the cognitive skills component, which accounts for the ability to activate and use the contents of one's mental knowledge structures and processes for a desired purpose. This component is composed of five communication skill dimensions that are conceptually developed and empirically supported. These cognitive communication skills include: appropriateness, interaction management, perspective taking, response repertoire, and language structure skills.

The second component of the proposed model is the behavioral skills component which accounts for one's psychomotor ability to speak, hear, see, and nonverbally express messages in a given situation. This component is composed of four communication skill dimensions that are conceptually developed and empirically supported. These behavioral communication skills include: articulation, expressiveness, listening, and reading nonverbals. The third and final component is a motivational component which is defined as the force(s) acting on a person to expend effort that they expect will result in the attainment of desired outcomes. This component uses an expectancy theory framework to describe the motivational process that drives a person to communicate competently within a given context and consists of two motivational dimensions (intrinsic outcomes and extrinsic outcomes) that are conceptually developed and empirically supported.

The three components are interactive in that a person's motivation usually drives their skill usage (e.g., a highly motivated person is likely to use the full range of his/her skills to attain a desired outcome, while an unmotivated person is not). In addition, the cognitive component and behavioral component are also interactive in that the behavioral component feeds input from the environment to the cognitive component. The cognitive component transforms this input by combining it with

the knowledge stored in one's memory and knowledge structures which facilitate the creation or construction of some message. The message is then delivered by the behavioral component as output. This interaction is consistent with Greene's (1984) action assembly theory of human communication.

As implied by the above discussion, the proposed model attempts to overcome concerns with previous models that were not communication-specific but tended to also account for interpersonal competence (e.g., Spitzberg and Wiemann). Scholars who study interpersonal competence tend to consider the broad spectrum of the whole person (e.g. White, 1959; Foote & Cottrell, 1955; among others) and consider this construct as primarily a social phenomenon (Argyle, 1981; Weiss, 1973; Steffen & Redden, 1977). This implies that communication competence is but a part of the larger construct of interpersonal competence (Perotti, 1987). Alternatively, the proposed model uses a more reductionist approach and focuses exclusively on communication competence, which accounts for the exchange of messages for the purpose of attaining outcomes. This overcomes concerns with previous attempts that are studying two different types of competence in one model and consequently are not doing justice to the study of either type of competence. This approach is supported by such scholars as Monge et al. (1982) who argue that a communicator competence construct, especially one developed for use in the workplace, ought to focus on communication and not social and interpersonal factors.

Given this general outline of the model and the fact that it is communication-specific, it is now possible to present the model in more detail. The discussion of the cognitive component, behavioral component, and motivational

component will contain a brief overview of previous conceptualizations and their weaknesses, an explication of the proposed conceptualization and its strengths, and a discussion of why the proposed view is more useful than previous attempts. These discussions will serve to overcome concerns with previous models that did not fully develop their components or describe the interaction among the components.

Cognitive Component

Previous Use of the Cognitive Component

The use of a cognitive component is a dominant theme in the literature and has been discussed under a number of different names, including: the cognitive domain, cognitive abilities, and cognitive skills. Regardless of the term used, these labels reflect the cognitive perspective of communication competence that considers communication to be a function of the cognitive structure and mental representations that underlie behavior (Wiemann & Backlund, 1980). Wiemann & Backlund (1980) emphasize that an understanding of the "cognitive aspects of the communication process is necessary for a complete understanding of the communicative behavior of individuals" (p. 187) since this domain provides the key to how individuals are able to adapt to and perform competently in different social contexts (Duran & Kelly, 1989).

The only authors who have developed a cognitive component in their models are McCroskey and Spitzberg. Both of these authors consider this component to be a knowledge component. For example, McCroskey (1982) describes this component as the "know-how" of the actor, while Spitzberg and Hecht (1984) describe it as knowledge of the context, other and subject. These and other authors (e.g. Hale &

Delia, 1976; Snyder & Cantor, 1980) consider knowledge to be a trait-like construct and argue that "the more knowledgeable a person is about the specific context, specific other, and specific topic discussed, the more likely the person is to possess the requisite information, experience, and repertoire to act competently in a situation" (Spitzberg & Hecht, p. 577). Yet, Cegala (1986) suggests that there is more to this component than just knowledge and that communication competence should develop a network of concepts that identify fundamental cognitive processes which serve individuals in defining, influencing and adapting to situations and contexts.

Cegala's point reflects this author's concerns with previous conceptualizations of this component. First, McCroskey and Spitzberg use a limited scope in viewing this component strictly as a knowledge component. This is especially true since Spitzberg and Hecht (1984) found that a lack of support for the knowledge component suggests "that knowledge is not the best explanatory metaphor" (p. 590) for this component.

A second concern is that McCroskey and Spitzberg do not clearly explain how one's knowledge relates to communicative behavior. A third concern, is that these authors do not sufficiently develop this component by developing cognitive dimensions (although McCroskey does discuss three levels of knowledge). The proposed cognitive component will overcome the above problems by accounting for more than just the use of one's knowledge, by explaining how this component relates to behavior, and by developing cognitive dimensions which are described in terms of skills.

Proposed Cognitive Component

Thus, the proposed component is conceived of as a skills component that accounts for the mental skills necessary to communicate. A cognitive skill is defined as the ability to activate relevant knowledge stored in one's mental knowledge structures for a purpose. This means that a person is able to take input in the form of incoming information or current knowledge and transform that input using some process to formulate some message. Examples of incoming information might be verbal or nonverbal messages from others which are supplied by the behavioral component. Examples of knowledge held in these structures would be knowledge of what is considered appropriate, knowledge of the structure of language, or knowledge of self, other, the situation, etc. Examples of processes would be perspective taking. Thus, an example of using one's cognitive skill would be if a person were to use his/her knowledge of the organization and its jargon as part of the process of determining an appropriate response. The end result of processing knowledge and information is usually some communicative response which may or may not be delivered using one's behavioral skills. The above conceptualization is consistent with Greene's (1984) conceptualization of action assembly theory. This conceptualization is also consistent with Richmond and McCroskey's claim that cognitive "skills involve understanding the communication process and being able to make appropriate choices of what to communicate and what not to communicate, depending on the context" (p. 67).

It is important to qualify the proposed conceptualization by noting that cognitive communication skills are meant to account for mental processes strictly associated with the act of communicating, and is thus concerned only with those

skills that are directly related to communication competence. It is not intended to be an all-inclusive category of mental skills, since many mental skills may be more suggestive of other types of competence. For example, the proposed cognitive component does not include technical skills or mathematical skills. These and other such mental skills may be necessary to effectively carry out a role (social competence) or adapt to a changing environment (fundamental competence) but would not be considered characteristic of cognitive skills associated with communication competence.

As can be seen, the above conceptualization of cognitive skill extends previous thinking about this component by incorporating McCroskey's (1977) and Spitzberg's (1983) view of knowledge with Meichenbaum et al.'s (1981) discussion of cognitive processes which refers to the thoughts and images that precede, accompany, and follow overt behaviors, and includes the information processing that the individual employs in social situations. Thus, the proposed cognitive component overcomes two of the concerns with previous models that were limited by only viewing this component in terms of knowledge, or that did not explain how the cognitive component relates to behavior.

In addition, the proposed cognitive component is argued to be more useful than previous conceptualizations because it views this component as a skills component. Richmond and McCroskey (1985) point out that "cognitive skills are central to becoming a truly effective communicator" (p. 67). By conceptualizing this component as a skills component it implies that skills are trainable and can be learned which is supported by a number of scholars (e.g. Richmond & McCroskey, 1985; Rubin, 1986). As Rubin (1986) points out, "most of our research is based on

the premise that individuals are 100% incompetent at birth and that training (i.e. education) makes a difference" (p. 4). This suggests that by learning and improving one's cognitive skills one can become more competent. This has important implications for organizations and supports the goal of this paper of showing the utility of studying communication competence in organizations as will be discussed in later sections. But, before discussing how cognitive skills can be learned, it is important to discuss previous cognitive dimensions which led to the development of the proposed cognitive skills.

Previous Cognitive Dimensions

As mentioned, Cegala (1986) notes that one goal of communication research is to develop a network of concepts that identify cognitive processes. A number of authors have addressed this goal by identifying dimensions that are indicative of the cognitive component. For example, Cegala (1986) claims that the cognitive phenomenon includes such things as attention to relational concerns and rules of politeness (appropriateness), and perspective taking. Other scholars (e.g., structural linguists Chomsky, 1965, and Pylyshyn, 1973) have identified knowledge of language structure as part of the cognitive domain. In addition, Duran and Kelly (1989) propose that interaction management is important, while Hymes (1971) considers response repertoire relevant to communication.

The above discussion captures the major efforts of authors to identify specific cognitive dimensions or skills. Yet, before incorporating any of the above dimensions into the proposed model it is important to compare them to an appropriate criteria. Thus, it is argued that the dimensions that are adopted into the proposed model should be: 1) conceptually developed, 2) communication- specific,

and 3) consistent with the proposed conceptualization of the cognitive component. By modifying the above dimensions, it is possible to create a five-dimensional scheme that satisfies this criteria and captures the cognitive skills most necessary to communicate competently.

Proposed Cognitive Dimensions

The five cognitive dimensions include: knowledge of appropriateness, knowledge of interaction management, perspective taking, response repertoire, and language structure. These five dimensions constitute the network of concepts for this component and are fully developed to overcome concerns with previous models (e.g., McCroskey and Spitzberg). The first skill dimension to be discussed is appropriateness.

Knowledge of Appropriateness. This dimension captures Cegala's (1986) concern for rules of politeness and is typically viewed in terms of the individual's understanding and knowledge of normative and idiosyncratic rules governing a given communication interaction (Cegala, 1986). This suggests that appropriateness means cognitive responsiveness such that one knows: what constitutes an appropriate response at any particular point in the encounter, as well as what is appropriate, when it's appropriate, and how to appropriately disclose (Duran & Kelly, 1989). This dimension accounts for the concern of Wiemann and Backlund (1980) that a person knows how to meet the basic contextual requirements such as the verbal, relational, and environmental requirements.

Given the above conceptualizations, knowledge of appropriateness is defined here as the ability to determine an acceptable response by using one's knowledge of contextual requirements and timing during any given encounter. This means that a

person has knowledge of what's appropriate and when it's appropriate. This definition captures the most relevant elements associated with this construct and emphasizes that knowledge is an integral part of this skill, since in order to process and mentally develop an appropriate response, one must have knowledge of a variety of elements including the contextual requirements. In an organization, a manager may utilize his/her knowledge of a particular employee's educational level, before formulating a response that fit that level and was thus appropriate for the relational context. As can be seen, this dimension meets the criteria for inclusion in this component since it is concerned with appropriateness of communication, it is conceptually explicated, and is relevant to the cognitive component which accounts for the mental processing necessary to respond appropriately. It is important to note, though, that the proposed dimension accounts for the process of determining appropriate responses, not the actual demonstration of appropriateness, which is done via skills found in the behavioral component.

Knowledge of Interaction Management. The second dimension in the cognitive network of concepts is knowledge of interaction management. This dimension is reflective of a similar dimension proposed by Duran and Kelly (1989), Wiemann (1977), and Pearce and Cronen (1980). These authors imply that one has a knowledge of how to establish and sustain a smooth pattern of interaction as well as a knowledge of how to maintain control of an interaction without dominating. This skill accounts for the mental processes that help a person to determine how to coordinate the conversation effectively. This requires using one's knowledge of a variety of interaction aspects which can be used to manage the interaction and facilitate a smooth conversation (Wiemann, 1977).

Given these conceptualizations, knowledge of interaction management is defined as the ability to process information and knowledge to determine how to establish, maintain, coordinate, and control interactions in a given context. Obviously, utilizing this skill requires tapping into one's knowledge of the situation, and what Greene (1984) calls interaction function records or management function records. This basically means using one's knowledge of interaction management strategies. For example, a manager might be leading a discussion which is getting off the desired topic. Thus, he/she may process incoming information about the situation, tap into his/her memory of interaction management strategies, and recall that asking reorienting questions is a useful strategy for controlling conversations. Again, the behavioral demonstration of a cognitive skill would be accounted for by the behavioral component.

This dimension has been absorbed into the cognitive component because research suggests that it is a key characteristic of communication competence (see Wiemann, 1977; Sypher, 1984). Even though previous conceptualizations combine behavioral skills in this dimension, it is still important to note that "based on the available evidence... interaction management is the sine qua non of competence" (Wiemann, 1977, p. 199). This view is supported by Kelly, Chase, and Wiemann (1979) who, in an extensive review, concluded that interaction management appears to be one of the preeminent characteristics of an effective communicator (Sypher 1984). In addition, Spitzberg and Hecht (1984) found that interaction management was the key to attaining self- satisfaction for both members of the dyad. As can be seen, this dimension meets the criteria for inclusion in this component, since it is concerned with management of communication, it is conceptually explicated as well

as empirically supported, and is relevant to the cognitive component since it accounts for the mental processing necessary to manage interactions.

Perspective Taking. A third dimension of the cognitive component is perspective taking. This dimension was identified by Cegala (1986) and others (see Wiemann, 1977) and suggests that the competent communicator is one who is able to take the view of the other in the process of accomplishing his/her own communicative goals. Sypher (1984) adds that perspective taking is "the imaginative transporting of oneself into the thinking, feeling and acting of another and so structuring the world as he does" (p. 110). Obviously, this will help facilitate effective communication, since it should help a person to predict the impact that various communicative actions will have on the other (Wiemann & Backlund, 1980).

Based on the above conceptualizations, perspective taking is defined here as the ability to take the role of the other and to predict the impact of one's communicative actions on the other. This means that a person processes incoming information and previous knowledge about the other as part of his/her efforts to see the world through the other's eyes. For example, a manager about to give critical feedback to a subordinate may use the information that he/she knows about the subordinate to "get into their shoes" and figure out a message that will be most effective as well as determine what types of responses the subordinate might have. Again, the delivery of that message is accounted for by the behavioral component.

This cognitive dimension has received much enthusiasm in the academic community with such authors as Athay and Darley (1981) calling perspective taking an instrumentally relevant factor of competence. This is supported by Kelly, Chase, and Wiemann (1979), who conducted an extensive review and concluded that

other-orientedness (perspective taking) appears to be one of the preeminent characteristics of an effective communicator.

Perspective taking is probably considered such an important skill since it is related to so many salient communication skills (both cognitive and behavioral) and outcomes. For example, Burleson (1982) shows that perspective taking is crucial to choosing appropriate speech (appropriateness dimension). Sypher (1984) and Athay and Darley (1981) add that perspective taking is also important to a person's ability to listen and read nonverbal cues (two proposed behavioral dimensions). Spitzberg and Hecht (1984) point out that perspective taking has been found to be the best predictor of both self and other's communication satisfaction. As can be seen, this dimension meets the criteria for inclusion in this component since it emphasizes perspective taking while communicating, it is conceptually explicated as well as empirically supported, and is relevant to the cognitive component since it accounts for the mental processing of other's perspectives prior to the development of communicative messages.

It is important to note, though, that the proposed perspective taking skill is a scaled-down version of a larger construct which comes from a much larger literature. This construct is considered a key construct by constructivists, social and interpersonal competence, and empathy scholars. For example, constructivists discussion of cognitive complexity consider perspective taking at a much higher level of abstraction than is conceived of here and accounts for a much broader scope of mental schemas than the processing of communication messages. In addition, social competence scholars (see Meichenbaum, 1981) note that role-taking underlies a variety of social cognitive skills, such as person perception (the

perception of what an individual is like as a whole) and empathy (the perception of another's affective state). The proposed dimension accounts for perspective taking as it relates to the exchange of messages (e.g., will this be accepted by the other) and does not attempt to include the ability to take the perspective of the other in a more global sense, which is more consistent with other types of competence such as interpersonal competence.

Response Repertoire. A fourth dimension of the cognitive component is response repertoire. Basically, Spitzberg (1983) and Spitzberg and Cupach (1984) consider the notion of response repertoire to account for the idea that communicators have knowledge of a range of behaviors from which to choose. This suggests that a person has in their memory many possible actions or responses that will work in a given situation. Greene (1984) would call this procedural records or knowledge of actions that have resulted in favorable or unfavorable results in the past. This repertoire can include "words, topics, themes and instrumental phrases" (Greene, 1984, p. 290). Thus, the communicator faces the task of selecting a response to perform from a range of responses at his/her command (Spitzberg & Cupach (1984). The development of this repertoire begins in early childhood and continues throughout life (Hymes, 1971).

The above conceptualizations suggest that the response repertoire of a competent communicator can be defined as the ability to access one's knowledge structures and have available a large and varied number of responses, messages, or alternative actions that could be chosen for use. This simply means that a communicator has many response options available. For example, an organizational presenter may get a question from the audience. After processing the question,

he/she may tap into his/her response repertoire and find that he/she has half a dozen or so responses from which to choose from. The selection criteria depends on the context, the desired outcome, etc. This conceptualization seems appropriate, since Wiemann and Backlund (1980) point out how essential it is that a person possess a large and varied response repertoire in order to communicate effectively. This dimension also incorporates the knowledge notion of McCroskey and Spitzberg, in that a person must have knowledge of the responses available to him/her at any particular moment so that he/she can choose the best available alternative in accordance with what is appropriate. As can be seen, this dimension meets the criteria for inclusion in this component since it is concerned with communication responses and is thus communication-specific, it is conceptually explicated, and is consistent with the cognitive component.

Constructivists are also likely to agree that this dimension is an important cognitive skill since they consider the development of a strategic behavioral repertoire essential to communication (Delia et al. 1982). This suggests that empirical support for this dimension can be implied by studies looking at cognitive differentiation which is a personality/trait variable that is distinct from but related to the proposed trait-like skill variable. Nevertheless, Rubin and Henzel (1984) suggest that a competent communicator has a highly differentiated construct system from which alternatives can be chosen when messages are being created. In addition, highly differentiated communicators are considered to be better able to produce listener-adapted messages (Sypher, 1984; Duran & Kelly, 1989), and are more effective communicators (Hale, 1980) than less differentiated communicators.

Knowledge of Language Structure. The fifth dimension of the cognitive component is knowledge of language structure which incorporates scholars' (e.g. Chomsky, 1965; Pylyshyn, 1973) concern for a knowledge of language. Language structure is also emphasized by McCroskey (1982) who claims that an individual's knowledge of the structure of language generally defines his/her linguistic knowledge or competence. Knowledge in this dimension is characterized by an understanding of syntax, punctuation, and grammar and would include the "utterance formulation" functions identified by Greene (1984). Using this knowledge helps in the process of constructing organized, coherent messages. Previous scholars (e.g., Duran, 1983) note that a competent communicator must be concerned with the proper construction of his/her messages at both the micro (unitary message unit) and macro (multiple message unit) levels.

Given this concern for language structure and its relevance to communication, this dimension is defined here as the ability to use one's knowledge of the structure of language (e.g., grammar, syntax, punctuation, etc.) to correctly construct organized, coherent messages. For example, when an employee is speaking with an other, he/she is likely to tap into his/her knowledge of correct grammar and sentence structure as part of the process of constructing a coherent message. Again, the delivery of that message is accounted for by the behavioral component (e.g., articulation). As can be seen, this dimension meets the criteria for inclusion in this component since it is communication-specific, it is conceptually explicated, and accounts it for the cognitive processes that occur when constructing messages.

The above dimensional scheme is an attempt to flesh out the most useful cognitive skills found in the literature. This suggests that a competent communicator knows how to determine an appropriate response, manage an interaction, take the perspective of the other, call up and choose a response from his/her rich behavioral repertoire, and to construct organized messages.

As can be seen, the proposed component overcomes concerns with previous models (e.g., Spitzberg and McCroskey) that did not conceptually explicate the dimensions associated with this component or used a limited scope in conceptualizing this component strictly as knowledge and ignored the process element. The proposed conceptualization is not only more useful because it overcomes the above concerns but also because it provides specific, testable skills which are argued to be trainable.

Learning Cognitive Skills

The argument that cognitive skills are trainable emphasizes that the proposed skills are considered to be trait-like and are not considered to be biological or personality traits such as intelligence or cognitive complexity. Since they are trait-like and not biologically determined, it suggests that they are trainable.

In addition, these skills are considered to be a matter of degree or level. For example, a person may have a high degree of skill in perspective taking and only a low degree of skill in interaction management. This notion is consistent with Cegala (1986), who points out that "competence is a matter of degree rather than an all or nothing phenomenon" (p. 4). Since competence is considered to be a matter of degree, then a person with a low degree of skill could be taught to improve that skill and hence become more competent. For this reason, it is important to determine a

taxonomy of skills associated with competent communication to use as a basis for training to improve competence. In addition, it is also important to note that as one is trained or develops knowledge in one skill area, he/she is also likely to develop knowledge in other skill areas. For example, as one increases their knowledge of what's appropriate in an organization, he/she is also likely to learn various interaction management strategies or responses that can be incorporated into his/her response repertoire.

Although the relationships among the skills is addressed in a later section, it is important to realize that skill levels can be improved or that skills can be trained. This notion is supported by a number of authors (e.g., McCroskey, 1982; Bochner and Kelly, 1974). Richmond and McCroskey (1985) also support this argument and point out that cognitive skills can be learned through formal instruction in schools and/or through experience in communication with other people. Thus a "communicatively competent individual is the product of a learning environment" (McCroskey, 1984, p. 267). This is supported by Wiemann and Backlund (1980) and Scheffler (1965), who argue that critical skills are acquired through training and are improved by practice.

As can be seen, conceptualizing the cognitive component as a skills component is more useful than previous attempts. The view that skills are indicative of competence and that they can be learned is especially important for effective functioning both in general and within the organizational context. As McCroskey (1982) notes "few communication professionals would argue...that acquiring basic communication skills is a necessity for effective participation in our society" (p. 9).

This is especially true since many organization's effectiveness and success is a function of the competence of its members (Perotti, 1987).

Yet, training cognitive communication skills has yet to be emphasized by organizations or academic institutions. As Richmond and McCroskey (1985) point out, formal instruction in the cognitive communication skills is very limited in most of our school systems, including our colleges and universities. Most formal instruction focuses on behavioral skills. The fact that most formal instruction emphasizes behavioral skills illustrates the importance of the behavioral component to the study of communication competence.

Behavioral Component

Previous Use of the Behavioral Component

The behavioral component of communication competence is a product of the behavioral perspective of competence, which focuses on a repertoire of skills appropriate to a variety of relationships and contexts (Wiemann & Backlund, 1980). Cegala (1986) claims "that although there are many references to the 'behavioral approach' in the literature, in most instances these refer to attempts to identify broadly defined concepts" (p. 26). Spitzberg (1983), McCroskey (1982), and Wiemann (1977), all adopt the behavioral approach in the development of their models, with Spitzberg (1983) claiming that this component accounts for what the actor "does," and includes all abilities and skills that are behaviorally enacted. McCroskey (1982) is similar in his conception, although he emphasizes that this is a psychomotor skills component which provides a potential for performance. Thus, both the Spitzberg and McCroskey models recognize the utility of a behavioral component consisting of skills.

However, the conceptualization of this component by such authors as Spitzberg (1983) and Wiemann (1977) is quite broad and accounts for skills that are not communication-specific as well as skills that reflect some other type of competence. Cegala (1986) agrees and points out that although these authors are identifying this as a communicative behavior skills component, they are really identifying "social skills" such as social perception, analytical thinking, anxiety, etc.

In addition, these authors are also identifying a number of other mental processes as well as behaviors in their conceptualization of this component. For example, Wiemann (1977) describes one "behavioral dimension" as interaction management, which is the "ability to handle procedural matters in a manner that is mutually satisfactory to all participants" (p. 199). Obviously a lot more is accounted for in that dimension than just behavior. A variety of mental and interpersonal activities are also identified. It is argued here that previous conceptualizations of the behavioral component (e.g., Spitzberg and Wiemann) have limited utility as a behavioral component of communication competence because they use too broad a conceptualization and include mental skills, and other skills commonly associated with interpersonal or social competence. The proposed behavioral component attempts to overcome these concerns.

Proposed Behavioral Component

The proposed behavioral component is conceived of here as being composed entirely of psychomotor communicative skills which include: articulation, expressiveness, listening, and reading nonverbals. This component accounts for how a person is able to communicate competently using his/her psychomotor skills which include his/her ability to speak (articulate), use body language expressively

(expressiveness), listen (listening), and pick up nonverbal cues (reading nonverbals). As can be seen, the proposed behavioral component is more communication specific and is only concerned with behavioral activities associated with the act of communicating. This component is not meant to include behavioral skills associated with other types of competence, nor is it intended to include mental processes which are accounted for in the cognitive component. This means that such skills as listening and reading nonverbals account for one's ability to hear or see messages that are delivered by an other. The behavioral component is not intended to account for the processing, interpreting, or creating of messages, since this is done by the cognitive component as will be discussed.

As with the cognitive component, the behavioral component is considered a skills component. According to McCroskey (1982), behavioral skill is the psychomotor ability of an individual to perform communicative behavior in a given situation, while Hymes (1971) would consider this the "speaking and hearing" abilities of a person. It is argued that speaking and hearing are not the only psychomotor activities that characterize this component, since these two activities are limited to verbal messages. Seeing is also considered a behavioral activity, since a person cannot hear an other's nonverbal message. In addition, expressing messages nonverbally is also considered a behavioral skill. This is appropriate since body language is considered a form of communication (Book et al. 1980).

Thus, behavioral skills are defined as the psychomotor ability of an individual to speak, hear, see, and nonverbally express communicative messages in a given situation. Behavioral skills within this component include verbal, nonverbal, and sensory-based skills (e.g., listening involves the hearing sense, reading nonverbal

cues involves listening and seeing, etc.). This conceptualization is consistent with Wiemann's (1977) definition of skill "which uses a whole chain of sensory...mechanisms" (p. 197).

It is important to note that this component accounts for psychomotor or behavioral skills and is not intended to account for mental processes or mental skills, although the two types of skills are highly interdependent. They are interdependent in that both behavioral skills and cognitive skills are needed for communication. The seeing and hearing abilities (reading nonverbals and listening) provide input to the cognitive component which processes the information and acts as a throughput mechanism by creating and providing messages to the behavioral component which are expressed or articulated and considered output. This description reflects Greene's (1984) notion of human communication and suggests that behavioral skills account for the ability to conduct a psychomotor act while the cognitive skills account for the mental processes behind such acts. For example, the creation of messages requires one to use his/her cognitive skills (e.g., appropriateness, language structure), while the delivery of such a message requires one to use his/her behavioral skills (e.g. articulating). This explanation illustrates the interactive nature of these components, which will be expanded in a later section.

The value of the above conceptualization of the behavioral component is that it is at a greater level of specificity than previous efforts. And as can be seen, is strictly communication- and behavior-specific. This is an attempt to overcome concerns with previous models that did not clearly delineate this component. As with the conceptualization of the behavioral component, the conceptualization of the

proposed behavioral dimensions is also at a greater level of specificity than previous efforts which are critiqued in the next section.

Previous Behavioral Dimensions

Previous behavioral dimensional schemes are numerous. A review of the literature reveals that roughly 53 dimensions exist that are either identified as behaviors or are not specified as either behavioral or cognitive skills. Unfortunately, as Spitzberg (1986) notes in his review of an extensive list of dimensions, most of these dimensions have no conceptual or empirical support.

This illustrates one of the major concerns with previous dimensional schemes: they are not conceptually developed or empirically supported. Two other concerns are that the dimensions are not communication-specific (e.g. they reflect other types of competence), and they are not behavior-specific (e.g. they incorporate mental processes as well as behavioral acts). Using the above issues as criteria, it is possible to review the 53 dimensions for utility. In accordance with the goal of this paper, to absorb only the most useful elements of past research, the only dimensions that will be included in the model are those that are: behavioral (as defined here), communication-specific, and conceptually developed and empirically supported.

Criteria One - Must Have Conceptual Development and Empirical Support. One of the most common problems with previous efforts to identify dimensional schemes is that the authors do not provide conceptual explication of their dimensions. Obviously, this makes it very difficult to determine if these are really tapping into behavioral skills indicative of communication competence. For example, Wiemann (1977) gives no conceptual explication of any of his dimensions (except

interaction management) but instead operationalizes them using behavioral measures (e.g., eye behavior, head nods, rate of speech, etc.). This makes it very difficult to determine what the dimension is really capturing conceptually. In addition, many dimensions that have been proposed (e.g., cueing, negotiation) have not been tested or have been tested and found to be unsupported. Examples of dimensions that do not have conceptual or empirical support include: Allen and Brown's (1976) feeling and imagining dimensions; Wiemann's (1977) affiliation/support and social relaxation dimensions; and Kelly and Chase's (1978) need for achievement dimension.

Criteria Two - Must be Communication Specific. An additional problem is that many dimensions are not communication-specific but instead are focusing on the broader concepts of social or interpersonal competence (Monge et al., 1982). Spitzberg and Cupach (1984) point out that a major problem with previous dimensional schemes is that not all of those dimensions are measuring communication competence. For example, the previously studied leadership factor is more akin to social competence (e.g., a trait associated with a social role) than communication competence. In addition, most of the authors are focusing on interpersonal competence instead of communication competence. For example, Wiemann (1977) uses a number of interpersonal oriented dimensions such as empathy (reciprocity of affect display) which is more consistent with interpersonal competence (be effective in an interpersonal interaction to satisfy mutual goals) than it is with communication competence. Other dimensions are more consistent with social or fundamental competence. For example, Holland and Baird's (1968) popularity, Duran's (1983) social composure, and Walters and Snavely's (1981)

social anxiety are more reflective of social competence; while Dustin and Ehly's (1984) flexibility dimension is more consistent with fundamental competence.

Criteria Three - Must be Behavior Specific. Many of the dimensions that remained could be eliminated as potential behavioral dimensions because they reflect mental processes associated with the proposed model's cognitive component. For example, Spitzberg and Hecht's (1984) other orientation dimension, and Holland and Baird's (1968) sensitivity to others dimension are conceptually more consistent with the perspective taking dimension of the proposed cognitive component. Similarly, Allen and Brown's (1976) controlling dimension, and Cushman and Craig's (1976) negotiation and cueing dimensions are conceptually more consistent with the proposed interaction management dimension of the cognitive component while Hart and Burks' (1972) appropriate language dimension is accounted for by the proposed appropriateness dimension.

Proposed Behavioral Dimensions

By eliminating those less useful dimensions from the original list of 53 dimensions, it results in a behavioral component that consists of four conceptually and empirically supported, communication and behavior-specific dimensions. These dimensions include: articulation, expressiveness, listening, and reading nonverbals. Support for these four dimensions comes from Duran et al. (1981) who identified articulation as an important dimension; Holland and Baird (1968) and Macklin and Rossiter (1976) who identified expressiveness; Bienvenu (1971), Cushman and Craig (1976), Phelps and Snavely (1980), and Walters and Snavely (1981) who identified listening; and Macklin and Rossiter (1976) who identified the reading nonverbals

dimension as an important behavioral skill. The following section explains the four proposed dimensions.

Articulation. The first behavioral skills component to be discussed is articulation. Duran (1983) claims that articulation deals with the manner in which sounds are perceived and produced. Articulation signals that words with different speech sounds convey different meanings (Duran, 1983). This suggests that the articulation dimension consists of proper pronunciation, fluent speech, proper enunciation, effective speech rate, etc. Thus, this dimension is defined as the ability to verbally communicate messages in a clear manner. An example of this skill might be a manager who conveys directions to his/her subordinates by enunciating and using a clearly understandable speech rate. Of course, the messages that are articulated are a product of the cognitive component and illustrates the interdependent nature of the skills components.

Richmond and McCroskey (1985) emphasize the importance of this dimension by noting that this skill is part of the foundation for effective communication. Duran (1983) who found support for this dimension adds that articulation contributes to increasing fidelity of message exchange and also increases the accuracy of the other's perceptions of the content of messages. Within an organization, Perotti (1987) found that key executives consider articulateness to be a significant characteristic of a competent communicator. As can be seen, this dimension is useful because it is behaviorally fundamental to communication and also because it meets the above-mentioned criteria.

Expressiveness. The second behavioral dimension is expressiveness. Spitzberg (1984) describes expressiveness as the degree to which interactants are

perceived to be involved and animated in their verbal and nonverbal conversational behavior. Macklin and Rossiter (1976) add that this suggests a concern for spontaneity. This would be indicated by the use of such things as: gesturing, postural movements, facial expressions, expressive use of voice and body, vocal tone variety, speaking and writing in a lively manner, laughing and smiling, etc. Thus, this dimension is defined as the ability to nonverbally communicate messages using body language, facial cues, and vocal intonations. An example of this skill might be an employee who is trying to make a point with his/her boss and uses nonverbal illustrators to get his/her idea across. As with articulation, expressiveness is also an output function of the cognitive component.

This dimension has been empirically shown to relate to communicative satisfaction and competence. For example, Spitzberg (1984) found that this skill significantly predicted communication satisfaction. In addition, Spitzberg and Hecht (1984) add that exemplary expressive behavior has been consistently related to impressions of competence by a number of authors (e.g., Barlow, Able, Blanchard, Bristow, & Young, 1977; Brandt, 1979; Greenwald, 1977). As can be seen, this skill is also useful since it meets the proposed criteria.

Listening. The third behavioral dimension is listening. Sypher (1984) claims that listening is considered to figure prominently in the understanding of communication competence. She notes that a number of communication researchers have emphasized the importance of listening in the communication process (e.g. Hart & Burks, 1972; Delia & Clark, 1975; Cushman & Craig, 1976). Listening can be considered to include such abilities as the ability to hear when a person is making a particular point, when he/she is giving opinion as opposed to

fact, and when he/she is providing implicit as opposed to explicit meanings in his/her messages. Thus, this dimension is defined as the ability to actively hear, receive, or behaviorally monitor messages from others. An example of this skill would be if a manager were able to hear the messages of his/her subordinate. Obviously, just listening to every word is not enough; a person needs to mentally process that information which is accounted for by the cognitive component. Thus, listening is one of the primary input mechanisms for the cognitive component. Again, this illustrates the interdependent and interactive nature of the two skills components.

Sypher (1984) notes that the "importance of listening has been recognized by corporate organizations who continue to sponsor programs designed to improve listening abilities" (p. 121). Empirical findings by Perotti (1987) suggest that the ability to listen and listen effectively is the most important single activity of the competent communicator according to key executives. There is also a likely relationship between listening behavior and job performance (Sypher, 1984).

In addition, this skill has also been positively correlated with a number of important communication variables. For example, Sypher (1984) shows that listening is related to cognitive differentiation (similar to the proposed response repertoire dimension) and perspective taking which further illustrates the interactive and highly interrelated nature of the dimensions and components of the proposed model. The above conceptual and empirical support suggest that listening is also a useful skill to include in the proposed model since it meets the necessary criteria.

Reading Nonverbals. The fourth behavioral dimension is reading nonverbals. Macklin and Rossiter (1976) use a different label but conceptualize it as an awareness of nonverbal cues or the capacity to pick up cues from others accurately. This

suggests that a person can behaviorally pick up messages from watching the other's facial or body cues (e.g., facial expressions, eye movement, posturing, etc.), and by hearing the other's tone of voice (e.g., note tonal differences, etc.). Thus, this dimension is defined as the ability to behaviorally hear or see an other's verbal and nonverbal communication cues. Yet, just hearing or seeing these cues is not enough; a person needs to mentally process and interpret that information which is accounted for by the cognitive component which attaches meaning to those cues by using one's skill in perspective taking, appropriateness, etc. As with listening, reading nonverbals is one of the primary input mechanisms for the cognitive component and again illustrates the interdependent and interactive nature of the two skills components.

Macklin and Rossiter (1976) found empirical support for this dimension and note that it relates positively with self-actualization. This dimension also meets the proposed criteria and serves to round out the four skills that comprise the behavioral component.

As can be seen, the four proposed dimensions are useful since they are clearly behavioral dimensions as conceptualized here and specifically capture the behavioral skills necessary to communicate competently and reflect Cegala's (1986) concern that conceptualizations "employ specific verbal and nonverbal categories as operational definitions of communication competence" (p. 25). The proposed skills are also useful in that they do not address some construct other than communication competence or account for the mental processes occurring in the cognitive component, although they do facilitate those processes. In addition, each of the proposed dimensions has conceptual development and empirical support.

Another reason that the proposed conceptualization of this component is useful, is that conceiving it as a skills component implies that the proposed behavioral skills could then be trained.

Learning Behavioral Skills

As already mentioned, the view the skills can be trained is supported by a number of authors. For example, Daniels and Pearson (1986) note that the literature assumes that communication behavior is essentially learned and acquired through experience. This assumption is also reflected by the federal government's efforts to provide communication skills education (McCroskey, 1982) and by organizations efforts to provide communication seminars and training programs.

And even though these organizational and educational training efforts are focusing on behavioral skills, it does not discount the necessity for cognitive skills training. Richmond and McCroskey (1985) agree and point out that acquisition of behavioral skills is only a step toward becoming an effective communicator, not a guarantee that an individual will become one. McCroskey (1982) concludes that we must break down complex communicative behaviors into small component skills that can be learned. This is what the proposed model attempts to do: break down the complex construct of communication competence into a taxonomy of cognitive and behavioral skills that can be learned.

Testing such a taxonomy contributes to this paper's goal of developing a comprehensive model of communication competence. To attain such a goal, it is necessary to test the following research question and hypothesis.

R1: Which of the proposed cognitive and behavioral communication skills do employees use to describe their communication competence?

H1: There are nine distinct skill dimensions of communication competence.

Testing the above research question and hypothesis would be useful for a number of reasons. First, efforts to study such a conceptualization in an organization would supplement and extend previous work done by Perotti (1987) who found that key executives consider the criteria for competence to be the ability to: articulate (articulation dimension), use a good vocabulary (language structure dimension), know how to use words appropriately (appropriateness dimension), and listen (listening dimension)(parentheses mine). The proposed study would extend that work and provide an even more comprehensive list of communication skills associated with communication competence in an organizational settings. Such a list could be used as a basis for employee selection and screening (Perotti, 1987) or in the process of performance reviews (Monge et al. 1982). A second reason this conceptualization is useful is that a determination of the skills necessary to be competent would provide a basis for skills training.

This reflects the second goal of this paper: to show the utility of the proposed conceptualization for assessing communication competence in organizations. Attempts such as this to facilitate the improvement of communication in organizations is important since Sypher claims that good communication is "crucial to organizational functioning" (1984, p. 116).

Yet, supporting the skill dimensions of the proposed cognitive and behavioral components is only one goal of this paper. It is also necessary to develop and test the motivational component of the model. The next section describes the motivational component, and how motivation drives a person to use his/her cognitive and behavioral skills.

Motivational Component

Previous Use of The Motivational Component

The motivational component has been considered an important component of communication competence by a number of authors most of whom describe this component in terms of affect (see McCroskey, 1982; Cegala, 1986). McCroskey (1982) conceptualizes this component as an affective domain which is composed of the attitudes and feelings of the learner about his/her knowledge (cognitive component) and skills (behavioral component). This suggests that a positive affect can occur if a positive outcome is associated with the use of a particular skill, and a negative affect if a negative outcome is associated with that skill (McCroskey, 1982).

Cegala (1986) considers this affective motivation to be a mood state which "is thought to be fundamental to an assessment of communication competence, and would appear to affect attentional processes during communication, information processing, memory, clarity of thought, involvement and interest, perspective taking and a host of other factors that are important to competent communicators" (Cegala, 1986, p. 22). According to Cegala (1986), this "mood state" is conceptualized as context specific and would appear to account for considerable variance in an individual's performance from setting to setting.

Spitzberg (1983) and his associates take a more outcome-oriented approach to motivation and point out that a person is more likely to achieve functional outcomes if he/she is motivated to interact with a person in a given context. Although they limit their conceptualization of outcomes to conversational outcomes, in a test of their model, the picture emerges of a motivated interactant producing more efficient communication (Spitzberg & Hecht, 1984).

Although motivation is considered an integral component of competence, there are a number of concerns with previous conceptualizations. One concern is the lack of conceptual development for this component. This is the least explicated component of any model presented in the literature (see Spitzberg, 1983; McCroskey, 1982).

In addition to the lack of conceptual development, a second concern is that previous attempts are somewhat limited in scope by describing motivation strictly as an affective learning component (e.g., McCroskey, 1982). It is argued that motivation is much more than just a liking for the particular skills that one may have. Instead, it is proposed that motivation is the result of an expectancy that expending effort will lead to a desired outcome. A third concern is that previous discussions of this component (e.g. McCroskey, Spitzberg) do not fully describe how this component relates to the cognitive and behavioral components.

Proposed Motivational Component

To address the above concerns, it is first necessary to define motivation. Motivation is defined here as the force acting on a person to expend effort that they expect will result in the attainment of outcomes that are of value. This definition implies an expectancy theory perspective and is consistent with Vroom who "defines motivation as the 'force' impelling a person to perform a particular action" (Lawler & Suttle, 1973, p. 483).

The proposed model attempts to overcome concerns with previous attempts by conceiving of motivation within an expectancy theory framework. This framework provides a much broader scope and explication of the motivation process as well as accounting for the interaction between motivation and skills. Although a

number of expectancy theories have been developed (see Porter and Lawler, 1968; Graen, 1969) and could be used, a model based on Lawler and Suttle's (1973) model clearly accounts for a person's motivation to communicate competently. This model is also consistent with Vroom (1964) and Galbraith and Cummings (1967).

Lawler and Suttle's (1973) model suggests that motivation or effort is a function of the perceived likelihood that effort will lead to performance, the likelihood that performance will lead to outcomes/rewards, and the valence of those outcomes/rewards. The outcome element of this model can be considered anything an individual wants to attain, while the valence is the anticipated satisfaction associated with that outcome (Mitchell, 1974). Visually, the model looks like this.

Effort = F(Effort -- Performance) x (Performance -- Outcomes)(Valence)

In general, this model suggests that a person expends effort to the extent that he/she values the outcome to be obtained by expending such effort. Of course, the above discussion describes how motivation accounts for effort in general and is therefore at a very high level of abstraction. Motivation viewed in this way could be argued to apply to all types of competence and would account for why a person chooses to expend and maintain effort to be considered interpersonally, fundamentally, or socially competent as well as communicatively competent. For example, Feidler and Beach (1978) found that expectancies about consequences following a behavioral act more adequately explained social incompetence than did the subject's behavioral repertoire.

Yet, since the proposed model is a model of communication competence, it is more useful to look specifically at communication effort and communication performance. That is, the proposed model views communication effort as one's

energy expended to communicate and communication performance as a product of one's communication skills and desire to communicate competently. Expectancy theorists (e.g. Lawler & Suttle, 1973) would visually represent this in the following way.

Communication Effort = F(Comm. Effort -- Comm. Performance) x
(Comm. Performance -- Outcomes)(Valence)

From this view, communicative effort is a function of the expectancy that expending effort to communicate is going to lead to some level of communicative performance. The next part of the equation concerns the likelihood that some level of communicative performance is going to lead to some outcome (e.g., recognition, peer acceptance, promotion, etc). The last part of the equation is the value of that outcome. Thus, outcomes are the goals, rewards, etc. which a communicator may receive as a result of his/her communicative performance which is in part a function of his/her communication skill. This means that if the outcome is highly positively valenced, then the communicator is going to be highly motivated to use his/her cognitive and behavioral skills to attain that outcome. For example, in an organizational context, a manager may be motivated to communicate competently in a presentation because he/she knows that a competent communicative performance may lead to a promotion (outcome) which he/she values positively.

Conversely, if the outcome is perceived to have a low valence, the communicator is going to be unmotivated to use his/her communication skills. This implies that a person's desire to attain valued outcomes is going to affect the way he/she communicates with other people. To attain valued outcomes, a person is going to use his or her behavioral and cognitive skills to maximize their communicative performance. The exact level of motivation to use these skills is a

function of the value placed on the outcome that is perceived to result from such a performance. The notion that higher motivation suggests higher skill usage is consistent with Williams (1979), who notes that higher motivational levels are associated with greater breadth and clarity of perception, increased attention span, and greater receptivity to relevant stimuli. This conceptualization is also consistent with Lawler and Suttle (1973) and Campbell and Pritchard's (1981) discussion of these components and accounts for how outcomes function to motivate a communicator to use or not use his/her cognitive and behavioral skills.

The proposed conceptualization is more useful than previous conceptualizations for a number of reasons. First, it expands the limited scope of previous authors. It expands the limited scope of McCroskey's conceptualization by considering that people are motivated by an affective reaction (valence) to an outcome that potentially effects the use of all their cognitive and behavioral skills. This accounts for how motivation drives the use of all skills, not just why a person's affective learning influences his or her preference for the use of one skill over others. In addition, this also accounts for Spitzberg's limited scope in dealing with motivation as one component and outcomes as another. The proposed view combines Spitzberg's motivational component and outcome component to show how these two constructs are both part of motivation, not separate and distinct entities. In addition, the proposed view takes a much broader view of outcomes than does Spitzberg.

Second, this approach explains the interaction of the proposed components, thus overcoming another concern with previous conceptualizations. Explicating this interaction is far more useful than just saying that "an actor cannot give a particularly

good performance unless he/she wants to" (Spitzberg, 1983). The proposed component explains not only why a person "wants to" but also what types of interactions occur when a person is pursuing what he or she wants. Third, the proposed conceptualization is more useful because it is based on expectancy theory, which describes specific types of outcomes (as will be discussed) that are assumed to motivate a person to communicate competently in an organizational setting. This is consistent with the objective of this paper to develop and test a taxonomy of motivational outcomes associated with communication competence which no previous communication competence study has attempted to do (e.g., Spitzberg, 1983; McCroskey, 1972; Wiemann, 1977). Testing the content of the motivational component prior to studying the process is consistent with the purpose of this model, as well as with Mitchell (1974), who claims that the first step in expectancy research is to generate a list of outcomes. A final reason that this conceptualization is useful is that an expectancy view is relevant to the organizational context. For example, Campbell and Pritchard (1981) note that expectancy theory is "currently the dominant theme in work motivation" (p. 75). Lawler and Suttle (1973) cite eighteen studies that consider this to be a valid model of work motivation.

As can be seen, the proposed component is useful since it overcomes the concerns associated with previous attempts. It uses a broader scope, a more detailed explication, and describes the interaction that occurs as part of the motivational process. Is also a well supported and widely accepted view of motivation. Yet, just providing a more useful conceptualization of this component is not enough. As mentioned, one of the objectives of this paper is to develop a

taxonomy of outcomes that motivate a person to communicate competently, and especially those outcomes that motivate a person in the organizational context.

Proposed Motivational Dimensions

A number of authors (Campbell & Pritchard, 1981; Lawler & Suttle, 1973) have shown that there are basically two types of outcomes, intrinsic and extrinsic, which are considered here to adequately account for the motivational outcome dimensions.

Intrinsic Motivators. Campbell and Pritchard (1981) claim that intrinsic outcomes are those mediated within the individual and which the individual grants or bestows to him/herself and are considered under the direct control of the individual. Intrinsic motivators can include such things as a feeling of having used one's abilities to the fullest, or feelings of accomplishment (Campbell & Pritchard, 1981). Thus, intrinsic motivators are defined here as those outcomes that are provided by the individual to him/herself. For example, a manager may communicate competently because he/she has a desire to communicate well with others.

Extrinsic Motivators. Campbell and Pritchard (1981) claim that extrinsic motivators are provided by the organization or by other people. Extrinsic motivators include such things as pay, recognition, support and consideration of a supervisor, promotion, fringe benefits, and reduced work load (Miner, 1980). Thus, extrinsic motivators are defined here as those outcomes that are provided by someone or something outside the individual. For example, a person might be motivated to communicate competently because he/she desires recognition from his/her boss.

These two dimensions are considered useful to the proposed model, since they are conceptually relevant to an expectancy theory framework and have also been empirically supported. For example, Lawler and Suttle (1973) factor analyzed

outcomes and found internally mediated outcomes and externally mediated outcomes, and noted that a study of seven different expectancy models/measures also found the same two dimensions. In addition, Vroom (1964) who simply asked subjects to rate importance of outcomes also found intrinsic and extrinsic factors (Lawler & Suttle, 1973). As a result, both Mitchell (1974) and Vroom (1966) note that these outcomes should be considered separate dimensions in any empirical test.

In addition to being empirically supported, these two dimensions have also been shown to relate to a number of organizational variables. For example, both outcomes are related to performance, although intrinsic outcomes are considered to be better predictors and correlate more highly with performance than do extrinsic outcomes (see Graen, 1969; Mitchell & Albright, 1972; Lawler & Suttle, 1973). When extrinsic motivators are associated with performance it's usually in the form of pay (Lawler & Porter, 1968). Mitchell (1974) adds that studies testing intrinsic and extrinsic motivators find consistently that intrinsic motivators do better in predicting performance and satisfaction than do extrinsic motivators (see Graen, 1969; Mitchell & Albrecht, 1972).

Although many of the early studies utilized lists of motivators developed by researchers (Miner, 1980), it is important to generate a list of motivators from the subject as well as from the experimenter, since theory would suggest that subjects' own motivators should be used (Mitchell, 1974). This gets at the context specific nature of motivators and reflects this study's concern with the importance of context in a study of communication competence. This is one of the reasons that employee interviews will be conducted to capture the organizational members view of relevant motivators. Miner (1980) supports such a technique and notes that this gets at the

rewards that are actually present in a given situation. In order to test the proposed conceptualization of the motivation component, the following research question and hypothesis will be tested.

R2: Which of the proposed motivational outcome dimensions do employees consider to motivate them to communicate competently?

H2: There are two distinct motivational outcome dimensions of communication competence.

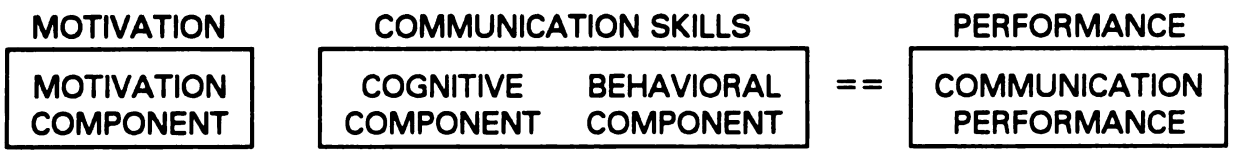
These questions reflect the objective of this paper with developing a taxonomy of motivational outcomes associated with communication competence and would provide a knowledge of which outcomes are motivating organizational members to communicate competently. This knowledge would be useful since it could potentially provide organizations with a list of desired outcomes that could be offered to employees to motivate them to communicate competently. This reflects the goal of this paper to apply this construct to organizations.

As already mentioned, another concern of this paper is to overcome weaknesses with previous models. Now that the three components of this model have been developed, it is time to note that the proposed model overcomes the concern with previous models that did not fully develop these components. The proposed model fully explicates each component and their dimensions, provides conceptual and empirical support for these components and dimensions, and illustrates that they are communication-specific. The only remaining concern to be addressed with previous models is their lack of explanation on how the components interact. The following section will address this concern by describing the interaction that occurs among the components.

Interaction Among Components

Figure 1 below visually illustrates the interaction of the components and how skills and motivation lead to communication performance. The proposed interaction reflects expectancy theorists (e.g. Lawler & Suttle, 1973; Campbell & Pritchard, 1981) view that performance is a product of skills and motivation and that feedback loops affect motivational levels. This suggests that basically the skills and motivation components are interacting continuously, with the motivation component driving the skills components and in turn the skills components providing information about potential outcomes to the motivation component. This is considered a cyclical interaction.

Figure 1



In some cases, a person's motivation is driving or preceding the use of his/her communication skills. For example, a person is talking with his/her boss and is motivated by a strong desire to get recognition (outcome) for his/her latest project. Since he/she is highly motivated to attain that outcome, he/she will likely use the full range of cognitive skills (e.g., use his/her knowledge of what's appropriate, how to manage the interaction, etc.) and the full range of his/her behavioral skills (e.g., articulate, show expressiveness, etc.) to get his/her boss to recognize his/her effort and thus attain the desired outcome.

The above discussion accounts for instances where the motivation component is driving the skills components. But, this is not always the case. The

skills components can also provide feedback to the motivation component by supplying input about the likelihood that a particular outcome is achievable. For example, a person's behavioral skills and cognitive skills may indicate that he/she is not likely to attain recognition from his/her boss, thus lowering his/her motivation to communicate competently. This notion reflects Porter and Lawler's (1968) concern with feedback loops that affect motivation and performance. Of course, if the person's communication skills suggested that there were other positive outcomes available (e.g., the opportunity to work on a desired project), then that may raise his/her motivation and then skill usage and the cycle would continue. This discussion illustrates that motivation can drive skill usage and that skill usage can also affect motivation by providing feedback about the likelihood of achieving desired outcomes as well as the availability of alternative desired outcomes, hence the two-way arrows in figure one.

The above discussion describes the interaction between the skills components and the motivation component. But as mentioned, there is also an interaction between the cognitive skills component and the behavioral skills component which needs to be more fully explained. It is argued here that this interaction is also cyclical (see figure 1). Input from the environment is fed from the behavioral component (via the listening and reading nonverbal dimensions) to the cognitive component. Within the cognitive component, messages would be processed using information from the environment and information stored in knowledge structures which would result in the formulation of a response that would then be delivered by the behavioral component (via articulation and expressiveness). For example, a person may behaviorally receive a message by listening, cognitively

access his/her knowledge structure of appropriateness (appropriateness dimension), cognitively formulate a response using his/her knowledge of the language (language structure dimension), and then behaviorally deliver that response by articulating (articulation dimension). This input-throughput-output interaction is consistent with Greene's (1984) action assembly theory and accounts for the interaction between the cognitive and behavioral skills components. The result of all the above interactions is communication performance.

Of course, it is important to note that since communication performance is a function of both motivation and skills, both are necessary for the demonstration of competence. For example, a person may be motivated to attain a desired outcome in a given situation. But, if he/she doesn't have the necessary skills, his/her performance is not likely to be considered competent by others since he/she is unable to demonstrate those skills. Conversely, a person may be considered incompetent because he/she lacks the motivation to use his/her skills. The notion that unmotivated people are not likely to use the skills they possess is consistent with Flavell's (1972) model of interpersonal inference processes. This model implies that interactants may possess certain cognitive abilities (e.g., perspective taking) or may have certain repertoires at their disposal (e.g., comforting behavior) but may not feel a desire to employ such abilities in a given interaction. This conceptualization is consistent with Campbell and Pritchard's (1981) view that performance is a function of motivation and ability. As can be seen, the three components are highly interactive and dependent on each other. This suggests that they are also highly related to each other. The following section completes the development of the proposed model by illustrating the relationships among the various dimensions.

Relationships Among Dimensions

Although the interdependent nature of the dimensions and components has been mentioned throughout the paper, it is also important to note that the eleven dimensions of this model (nine skill dimensions and two motivational dimensions) are argued to be positively related to each other. This is consistent with Rubin and Henzl (1985), who studied a number of communication competence dimensions and found them to be interrelated and not independent. The specific breakdown of how each dimension relates to other dimensions can be found in Table 1.

Table 1 illustrates that each of the cognitive skills relates positively to other cognitive skills. This is because these are knowledge-based skills which are a product of learning or developing mental structures or records. The developing or learning of one cognitive skill also facilitates the development of learning of another. As a person develops knowledge of what's appropriate in an organization, they are also developing knowledge of interaction management strategies, what types of perspectives exist, what types of responses are used (thus increasing their repertoire) and how messages are constructed and organized. This means that all of the cognitive skills are going to be positively related to each other since a person who is high in one skill is also likely to be high in another. This suggests that those with high levels of the appropriateness skill are also likely to have high (but not necessarily equal) levels of interaction management, perspective taking, response repertoire, and language structure skills. Take the response repertoire skill, for example. The larger the person's response repertoire, the more knowledge they have developed about potential responses which suggests that in the process of

Table 1

Predicted Relationships Among Communication Competence Dimensions

Dimensions	AP	IM	PT	RR	LS	AT	EX	LI	NV	IN	EM
Cognitive Component											
Appropriateness (AP)	+	+	+	+	+	+	+	+	+	+	+
Interaction Mgmt. (IM)	+	+	+	+	+	+	+	+	+	+	+
Perspective Taking (PT)	+	+	+	+	+	+	+	+	+	+	+
Response Repertoire (RR)	+	+	+	+	+	+	+	+	+	+	+
Language Structure (LS)	+	+	+	+	+	+	+	+	+	+	+
Behavioral Component											
Articulation (AT)	+	+	+	+	+	+	+	+	+	+	+
Expressiveness (EX)	+	+	+	+	+	+	+	+	+	+	+
Listening (LI)	+	+	+	+	+	+	+	+	+	+	+
Reading Nonverbals (NV)	+	+	+	+	+	+	+	+	+	+	+
Motivational Component											
Intrinsic Motiv. (IN)	+	+	+	+	+	+	+	+	+	+	+
Extrinsic Motiv. (EM)	+	+	+	+	+	+	+	+	+	+	+

learning potential responses they have also learned about what is appropriate, which interaction management strategies are useful, what types of perspectives are used in the organization, etc.

Support for the above arguments that the cognitive skills are all positively related to each other is implied by authors such as Sypher (1984) and Delia and

O'Keefe (1979) who note that high levels of perspective taking skill are associated with high levels of message production abilities which is accounted for by this model's language structure skill. While Burleson (1982) adds that perspective taking is associated with the ability to adapt the form and content of a message to the audience, which reflects this models appropriateness dimension. In addition, arguments by Sypher (1984) imply that those with differentiated responses (response repertoire) and perspective taking skill are better able to produce listener-adapted messages (respond appropriately). Although the levels of each skill may differ, the above arguments illustrate that the cognitive dimensions are all likely to be positively related and not unrelated or negatively related. A negative relationship would suggest that one high in knowledge of a particular skill is likely to be low in knowledge of another cognitive skill. This is argued not to be the case since it is assumed that as one learns a particular skill by developing knowledge; this learning is not exclusively related to one particular skill at a time but includes knowledge units relative to a variety of skills. Hence, as a person improves one cognitive skill he/she is likely to improve others as well. This is implied by Spitzberg and Hecht (1984), who claim that the more knowledge a person has about a particular state, the more likely the person is to possess information, experience, repertoires, etc. to act competently.

In addition, the cognitive skills are also argued to be positively related to the behavioral skills. This is based on the previously mentioned interdependent nature of the cognitive and behavioral components and action assembly theory. This suggests that the better the input (suggesting a high skill in listening or reading nonverbals) the better the throughput (suggesting high levels of cognitive skill) the

better the output (suggesting a high level of articulation or expressiveness skill). Conversely, a person who is low in behavioral reception skills (listening, reading nonverbals) is not likely to get enough information to adequately build his/her knowledge structures, which suggests a corresponding lack of cognitive skill development, which of course is going to affect their message sending skills (articulation and expressiveness). This view is implied by authors such as Sypher (1984), who notes that listening and reading nonverbals is related to one's ability to take other's perspective. Support for this positive relationships can also be implied from Rubin and Henzl's (1985) finding that people high in cognitive differentiation (similar to this model's response repertoire skill) are better at nonverbal encoding (expressiveness), at articulating words clearly and correctly (articulation), at listening, and at naming nonverbal behaviors (reading nonverbals).

The cognitive skills are also argued to be positively related to the motivational dimensions. This is because as argued earlier, the more motivated a person is, the more likely he/she is to use his/her cognitive skills and thus more likely to develop those skills. The less motivated they are, the less likely they are to use their skills suggesting that they get less practice and thus less skill development. This assumes that skill development comes with practice, which is supported by Richmond and McCroskey (1985). Spitzberg (1986) adds that findings show that unmotivated subjects revealed skill deficits in an average interaction. In addition, as mentioned in the section on the motivational process, a person is likely to be motivated to perform if he/she feels his/her performance or skills will result in attaining the desired reward. Thus, the more skilled a person is the more likely he/she is to be motivated since success in obtaining outcomes is more likely and

vice versa. Support for the above arguments comes from Cegala (1986) who argues that motivation accounts for considerable variance in individual performance which suggests that as motivation goes up so too does one's skill usage, which suggests that over time so will their skill level. This provides general support for why overall cognitive skills are positively related to motivation. Support for specific dimensions comes from Cegala (1986) who found that motivation is positively related to perspective taking.

With this understanding of the various relationships of the cognitive skills within the model, it is possible to look at how the behavioral skills relate to each other and to the motivational dimensions. It is argued here that the behavioral skills are all positively related with each other. This suggests that if a person is a good articulator, then he/she is also likely to be good at expressing his/herself nonverbally. Or if a person is good at picking up messages through listening they are also good at picking up messages by watching someone's behavior (reading nonverbals). The assumption here is that if a person is adept in one behavioral skill he/she is likely to be adept in other behavioral skills. An appropriate analogy here can be found in sports as characterized by the "good athlete." A person who is proficient in one sport is usually fairly proficient in other sports as well. This suggests that if a person is able to articulate well they are also likely to be proficient in other behavioral skills. Support for such a claim comes from Monge et al. (1982), who found that encoding and decoding skills were positively correlated.

In addition, behavioral skills are also argued to be positively related to the motivational dimensions. The argument here is the same as mentioned for the cognitive skills which emphasized that the more motivated a person is, the more

likely he/she is to use his/her behavioral skills which helps to develop those skills which in turn increases the likelihood that a person will be motivated to perform. Support for such a claim can be implied by Williams (1979) finding that motivation is positively associated with a greater receptivity to relevant stimuli (e.g., listening and reading nonverbals).

In addition to the above relationships, the motivational dimensions are also argued to be positively related to each other. This means that if a person is intrinsically motivated, they are also likely to be extrinsically motivated. The assumption here is that if a person is motivated to communicate it is to obtain outcomes that are intrinsic and outcomes that are extrinsic. This is reflected by social exchange theory (Thibaut & Kelly, 1959), which argues that people interact to maximize their outcomes. This means maximizing one's intrinsic as well as extrinsic outcomes. Although in any given situation, a person may be more motivated by one type of outcome than another, not many would argue that a person is motivated exclusively by intrinsic or exclusively by extrinsic outcomes. Thus, the relationship among the types of outcomes is considered positive.

The preceding discussion illustrates the proposed model is composed of dimensions that are positively related to each other. Of course, to support this argument it is necessary to test the following hypothesis.

H3: The proposed 11 dimensions of communication competence are all positively related to each other.

By supporting this hypothesis and the previous two hypotheses, it will illustrate that the content of the proposed model is accounted for by 11 distinct dimensions that are positively related to each other and which are interdependent in nature. This will contribute to this paper's goal of synthesizing and refining the

construct of communication competence by developing and testing a taxonomy of competence dimensions.

The Nomothetic Network

Yet, even if the proposed taxonomy was supported, it would still not ensure that the measure was getting at the construct of communication competence. For this reason, it is also necessary to clarify how communication competence relates to other variables which is another goal of this paper. This gets at construct validity, which seeks the meaning of a construct through the relationships between the construct and other constructs (Kerlinger, 1986). Cronbach and Meehl (1955) add that it is important to conceptually define a construct by identifying and testing the nomothetic network in which it exists. A nomothetic network is the family of variables that are considered to conceptually relate to a specific construct such as communication competence. Once a nomothetic network is conceptually developed or determined for a particular variable, it is possible to test the proposed relationships. "If the empirical relationships are consistent with the conceptual relations specified by the network, there is evidence for the validity of the construct" (Stiff, Miller, Dillard & Somera, 1990, p. 11). Evidence for construct validity is provided by empirically supporting the proposed conceptualizations of how communication competence should relate to variables in its nomothetic network. With this in mind, the proposed study attempts to conceptually develop and empirically test a variety of variables in the nomothetic network of communication competence including variables that are considered to be negatively related (communication apprehension and role ambiguity), unrelated (job identification), and positively related (communication satisfaction and communicative responsiveness).

A specific breakdown of how each communication competence dimension relates to variables (and their dimensions) in the nomothetic network can be found in Table 2.

Testing the relationship of the communication competence dimensions with variables and dimensions in its nomothetic network reflects the goal of this paper to contribute to the validation of the construct. It is especially important to validate constructs to ensure that the conceptual and empirical elements underlying those constructs are really tapping into the construct under question. Testing the nomothetic network contributes to such a validation, yet more work needs to be done to fully validate the proposed communication competence model as will be discussed in a later section.

Communication Apprehension

The first variable to be discussed is communication apprehension. Communication apprehension is defined as "an individual's level of fear or anxiety associated with either real or anticipated communication with another person or persons" (McCroskey 1977, 1978, 1984). "Communication apprehension 'encompasses all modes of communication' and should not be restricted to talking, although apprehension about talking is the more common form of CA" (Richmond & McCroskey, 1985: p. 31).

Levine and McCroskey (1990) consider this construct to consist of "context-specific" subscales that are related but discrete subconstructs (e.g. groups, meetings, conversations, speeches). This multidimensional trait-like anxiety construct could occur prior to or simultaneously with a person's efforts to communicate. In general, since anxiety is considered to detract from successful

Table 2

Predicted Relationships Between Communication Competence Dimensions And the Nomothetic Network

Dimensions	CAGR	CAMT	CACV	CASP	RA	JD	ECR	CSCE	CSCI	CSSC	CSFD
Cognitive Component											
Appropriateness (AP)	-	-	-	-	-	+	+	+	+	+	o
Interaction Mgmt. (IM)	-	-	-	-	-	o	+	+	+	+	o
Perspective Taking (PT)	-	-	-	-	-	o	+	o	o	+	o
Response Repertoire (RR)	-	-	-	-	-	o	+	o	o	+	o
Language Structure (LS)	-	-	-	-	-	o	+	+	+	+	o
Behavioral Component											
Articulation (AT)	-	-	-	-	-	o	+	+	+	+	o
Expressiveness (EX)	-	-	-	-	-	o	+	o	o	o	o
Listening (LI)	-	-	-	-	-	o	+	+	+	o	o
Reading Nonverbals (NV)	-	-	-	-	-	o	+	o	o	o	o
Motivational Component											
Intrinsic Motiv. (IN)	-	-	-	-	-	o	+	o	o	o	o
Extrinsic Motiv. (EM)	-	-	-	-	-	o	+	o	o	o	o

Legend:

Communication Apprehension Dimensions
- Groups = CAGR
- Meetings = CAMT
- Conversations = CACV
- Speeches = CASP

Communication Satisfaction Dimensions
- Communication Effectiveness = CSCE
- Corporate Information = CSCI
- Supervisory Communication = CSSC
- Feedback = CSFD

Role Ambiguity = RA

Empathic Communicative Responsiveness = ECR

Job Identification = JD

performance, apprehension is argued not to be conducive to the effective use of one's cognitive and behavioral skills It is also argued to be a damper on one's motivation, since it likely reduces the probability that one's effort will lead to successful communicative performance. These arguments are supported by Spitzberg (1986), who points out that Hazelton and Cupach (1984) found that motivation and knowledge (cognitive component) were negatively related to communication apprehension.

Thus, it is predicted that a negative correlation exists between the communication apprehension dimensions and all the communication competence dimensions. This prediction of an inverse relationship is supported by a number of communication researchers (e.g. Duran, 1983; Wiemann, 1977; Kelly, Chase & Wiemann, 1979; Rubin, 1985). In the case of communication apprehension, it is not necessary to make separate predictions for each of the four communication apprehension dimensions, since Richmond and McCroskey (1985) note that communication apprehension is influenced by general feelings about communication more than by specific contexts (e.g., group, meetings, etc.). They point out that "you are either anxious in virtually all communication situations or you are anxious in virtually no communication situations" (Richmond & McCroskey, 1985, p. 34).

A detailed description of how each communication competence factor relates to each communication apprehension factor can be found in Table 2 which illustrates that each of the cognitive skills is negatively related to each of the communication apprehension dimensions. This suggests that the higher a person's cognitive communication skill, the less likely he/she is to be apprehensive. This is because the person is able to determine what's appropriate, knows how to manage

interactions, can take the perspective of the other, use a large response repertoire, and construct logical messages. If he/she is able to do that, then he/she should be confident about their communicative abilities and thus less likely to be apprehensive about communicating. For example, findings (see Duran & Kelly, 1989: Cegala, 1986) show a negative relationship between communication apprehension and the cognitive skill of perspective taking. This implies that a person with high cognitive skills or knowledge of what (appropriateness, response repertoire) or how (interaction management, perspective taking, language structure) to communicate is going to feel less anxiety about communicating than a person who doesn't know what or how to communicate. This argument is considered to hold true across the four contexts of communication apprehension since it is assumed that it is one's skill level and not the context which is more likely to effect apprehension.

The same argument holds true for the behavioral skills of articulation and expressiveness. If a person is skillful in being articulate and expressive, then he/she is less likely to be apprehensive about communicating since he/she knows he/she can express messages well regardless of the context. The behavioral skills of listening and reading nonverbals are also likely to be negatively related to communication apprehension. This is because these two dimensions account for a person's ability to receive information, which can be used to reduce uncertainty about the situation and thus apprehension. By monitoring the situation through listening and reading nonverbals, the person can gather information that helps to reduce uncertainty about how to communicate as well as provide cues about what is appropriate to communicate. The better a person is at listening and reading nonverbals the more information they will pick up and the more apprehension they

will reduce. This is reflected in Uncertainty Reduction Theory (see Berger and Calabrese, 1975) and is argued to hold true for each of the four contexts of communication apprehension.

The motivational dimensions are also predicted to be negatively related to the communication apprehension contexts. This is because apprehension is assumed to hinder motivation. If a person is apprehensive about communicating, he/she is less likely to perform well and thus be less likely to attain his/her desired outcome. According to expectancy theory, if there is a low probability that effort will lead to the desired outcome then it is less likely that a person is going to expend effort. Thus, the more apprehension, the less motivation to communicate. This is reflected in five studies noted by Spitzberg (1986) where socially anxious subjects suffered in terms of their general motivation to interact. For this reason, both of the motivational dimensions are argued to be negatively related to each of the communication apprehension contexts.

As can be seen, the previous arguments suggest that the dimensions of communication competence are all negatively related to the four communication apprehension dimensions. These predictions are reflected in Table 2.

Role Ambiguity

The second variable to be studied in the communication competence nomothetic network is role ambiguity. Schuler et al. (1977) describe role ambiguity as the existence or lack of clarity about one's role or uncertainty regarding the outcomes of one's role performance. Role ambiguity occurs when information about roles is vague, ambiguous or unclear, thereby making it difficult for the employee to fulfill the desired sent roles (Schuler, 1977). Hamner and Tosi (1974)

agree and point out that role ambiguity results from a lack of information about the role tasks.

Since information is exchanged by communicating, it seems likely that one's communication competence is going to affect his/her role ambiguity. This is supported by Sypher (1984) who points out that roles are considered to be "developed, changed, accepted and rejected through communication" (p. 103). Thus, a person's communication skills would account for his/her ability to solicit and receive information about roles.

To overcome role uncertainty, a person is likely to increase his/her information gathering efforts by using his/her communication skills, which in turn would help to reduce that uncertainty about his/her role and the outcomes of his/her performance. This is consistent with Uncertainty Reduction Theory which would assert that an increase in information seeking is associated with a decrease in uncertainty (Berger & Calabrese, 1975). It is argued here that a competent communicator is better able than an incompetent communicator to gather and process role information which would lead to uncertainty reduction and a decrease in role ambiguity. This is suggested by Sypher (1984) who claims that an "effective communicator is able to strategically negotiate with others to clarify expectations toward situations" and roles (p. 109). Consequently, a competent communicator (one with high cognitive and behavioral skill levels) is likely to end up with lower role ambiguity than an incompetent communicator (low skill levels). This is especially true since Sypher (1984) notes that a person's level of communication competence is likely to effect their role.

Of course how successful a competent communicator is in reducing role ambiguity is likely to be moderated by the extent that role expectations for a particular job are known and provided by the host organization. Hence, this relationship is moderated by the availability of information. To the extent that information is known and available, the communicatively competent person will be better able to reduce ambiguity than an incompetent communicator.

In general, the above arguments suggest that all the proposed communication skills are inversely related to role ambiguity. This is because these skills are useful in requesting or soliciting information. For example, the cognitive skills would be useful in reducing role ambiguity, especially the interaction management, skill which facilitates the manipulation of interactions to potentially provide information to reduce uncertainty. This is supported by Schuler et al. (1977) who point out that one way to reduce ambiguity is through "feedback from agents and dealing with others" (p. 114). An interaction management skill would greatly facilitate feedback from others as well as help in dealing with others. Of course, other cognitive skills such as one's knowledge of appropriateness, response repertoire, and language structure would also help in requesting information about roles, while one's perspective taking skill would allow a person to more accurately understand an other's (e.g., a boss) communication about roles.

The behavioral skills associated with requesting and receiving information (articulation, expressiveness, listening, and reading nonverbals) are also predicted to be negatively related, since the better a person is at articulating and expressing an interest in role information, listening to information, and reading messages provided

by an other's nonverbals (e.g., head nod responses to questions, etc.), the more likely he/she is to reduce ambiguity.

In addition, both motivational dimensions are also argued to be negatively related since the more motivated a person is to communicate competently (regardless of the type of outcomes) the more likely he/she is to communicate competently and thus reduce role ambiguity. This is reflected by previously mentioned findings (Williams, 1979) which illustrate that motivated people are more receptive and thus more likely to assimilate role-relevant information. Table 2 illustrates the predicted relationships of the proposed communication dimensions to role ambiguity.

Job Identification

The next variable to be discussed is job identification which is defined as the "adopting as one's own the goals and values of the organization" (Buchanan, 1974). Thus, job identification is considered to be a fit between the goals and values of an organization and the individual.

Job identification is an attitudinal variable that is likely to be unrelated to communication competence since it is a function of affective reactions to one's job or the organization and not communication. These affective reactions may be an indirect product of communications with others (e.g., socialization) but are more directly the result of the relative congruence between the person's value system and that of the job or organization. Thus, job identification is considered not to be a function of one's communication competence. Such a claim is consistent with Lee (1971) who found that organizational identification was primarily a product of one's sense of work accomplishment, relations with supervisors, and length of

organizational service. Findings by Hrebiniak and Alutto (1973) add that job identification is also a function of role tension and dissatisfaction with the bases of organizational advancement. These findings suggest that job identification is not a function of communication competence but of specific organizational variables such as tenure.

Hence, almost all of the proposed communication skills and motivators are argued to be unrelated to job identification, since job identification is an attitudinal variable that is a function of personal and organizational conditions and not a function of communication skill. One's cognitive and behavioral skills may help to request and receive information about an organization, but that doesn't mean the individual will therefore identify with the organization. Similarly, one's motivation to communicate competently is also not likely to be related to job identification, since it only affects the use of one's communication skills which are argued to be unrelated.

The only skill that might relate (positively) is the cognitive skill of appropriateness. This is because if a person has a lot of knowledge about the appropriateness of communication in an organization, he/she knows more about the organization's norms, rules, etc. and are therefore more likely to identify with it more. This would be suggested by Cognitive Dissonance Theory in that a person may think "I know what is appropriate and respond appropriately, so I must identify with the organization." In addition, to develop one's appropriateness skill he/she must spend time in an organization which implies some degree of tenure or advancement which are related to identification. Thus, appropriateness is the only communication dimension that is predicted to be related to job identification.

Empathy-Communicative Responsiveness

The next variable to be discussed is empathy. Miller et al. (1988) note that this personality variable accounts for one's "ability to understand and share in people's experiences" (p. 254). Foote and Cottrell (1955) add that it is the "ability to correctly interpret the attitudes and intentions of others and accurately perceive situations from their standpoint in order to anticipate and predict their behavior" (p. 54).

Farber (1961) suggests that communication competence and empathy are related by pointing out that both communication competence and empathy are concerned with the process of understanding and accurately interpreting an other. This is consistent with Miller and Steinberg (1975) who argue that "we do not bestow the title of 'good empathasizer' upon someone unless they communicate with us in rewarding ways" (p.175). Stiff et al. (1988) add that empathic responses are communicative in nature, which suggests that communication competence is going to affect the expression of empathic messages. Thus, it is argued that the more competent a communicator is the better able he/she will be at interpreting, understanding, and consequently empathizing with an other.

Of course, it is important to note that empathy is considered to be a multidimensional concept (see Davis, 1983; Deutsch & Madle, 1975; Feshbach, 1975; Gladstein, 1983) with a number of components. Not all of which are relevant to the proposed study. The empathy component most relevant to the proposed model is communicative responsiveness.

Communicative responsiveness is considered a communication component of empathy by Stiff et al. (1988). Stiff et al. (1990) claim that communicative

responsiveness is defined as a "broadly-based social skill which could encompass a number of communicative activities (i.e., listening skills as well as message production)" which "enables individuals to respond effectively to the emotional states of others" (p. 4). Thus, communicative responsiveness is a trait measure which is concerned with one's ability to communicate effectively to others who are experiencing distress (Stiff et al., 1988). In general, this suggests that communicative responsiveness should be positively related to communication competence since the more competent a communicator is the more likely he/she is to be able to respond to an other's emotional state.

Specifically, it is argued here that all of the proposed communication competence dimensions are positively related to communicative responsiveness. Each of the cognitive skills is positively related since these skills allow for processing information about a person's emotional state and developing empathic responses. For example, a person's interaction management skill allows them to orient the discussion toward the other's feelings, while perspective taking allows one to better understand the other. This is supported by Spitzberg and Cupach (1984) who found that empathy and perspective taking are related. In addition, the appropriateness, response repertoire and language structure skills also facilitate the development of information that can be used for empathic responses.

In addition, since Stiff et al. (1988) describe communicative responsiveness as addressing a broad range of encoding and decoding skills, it seems reasonable to argue that each of the behavioral skills is also positively related. This is likely since the behavioral skills account for one's ability to receive information (e.g. listening and

reading nonverbals) about a person's emotional state, as well as deliver empathic responses by articulating and being expressive.

And since Stiff et al. (1988) note that communicative responsiveness also taps into the motivation to employ one's communication skills, it is also likely that communicative responsiveness is positively related to the proposed model's motivation dimensions. This is because the more motivated a person is the more likely they are to communicate competently and thus the more likely they are to be communicatively responsive to an other's emotional state. Table 2 illustrates the predicted relationships of the proposed communication dimensions to communicative responsiveness.

Communication Satisfaction

The last variable in the nomothetic network to be discussed is communication satisfaction. In a general sense, communication satisfaction is defined as the "personal satisfaction inherent in successfully communicating to someone or in successfully being communicated with" (Thayer, 1968, p. 144). This suggests that "satisfying relationships with other people are established through communication, and that our ability to communicate well is important" (Rossiter & Pearce, 1975, p. 3).

In an organization, communication satisfaction is considered to be a multidimensional construct (see Downs & Hazen, 1977; Clampitt & Girard, 1986) that has been proposed to account for one's satisfaction with the general communication effectiveness, corporate information, supervisory communication, and feedback in the organization (Clampitt & Girard, 1987). Thus, communication satisfaction is a state variable that is argued here to be an outcome of communication competence. This is implied by Clampitt and Girard (1986) who claim that satisfaction with

communication is apparently highly contingent on such variables as communicator style, communication networks, and the perceptual abilities of the communicator.

Although argued to be an outcome of communication competence, it is important to note that satisfaction could be moderated by the availability and quality of communication provided by the organization. This suggests that one's level of communication satisfaction is contingent on more than just one's communication competence. For example, no matter how competent a person is in getting and receiving information, if the organization does not provide such information then a person is not likely to be satisfied with such dimensions as communication effectiveness, corporate information, or feedback. This means that the relationships here are less direct than previous variables.

Nevertheless, Hecht (1978) argues that communication satisfaction is considered a good contextual criterion for assessing communication competence and should be positively related. This positive relationship is also inferred by Spitzberg and Cupach (1984) who studied interpersonal communication satisfaction and found substantial positive relationships between satisfaction and ratings of competence (see Cupach, 1982; Cupach and Spitzberg, 1981; Duran, Qakahi & Mumper, 1982; Spitzberg, 1982).

In general, it is argued that the competent communicator is likely to be more satisfied. This is because a competent communicator is likely to be more successful in his/her communication and in getting and receiving information than an incompetent communicator. Consequently, a competent communicator is likely to be more satisfied with the communication he/she receives within the organization. Yet, this general statement is not precise enough for construct validation. It is also

necessary to discuss how each communication competence dimension relates to each communication satisfaction dimension. A visual description of these relationships can be found in Table 2.

The first communication satisfaction dimension to be discussed is communication effectiveness. Although they don't conceptually develop their dimensions, Clampitt and Girard (1987) operationalize communication effectiveness as the extent to which an employee is satisfied with the amount, accuracy, practices, and types of communication provided by the organization. Communication in this dimension does not focus on interaction with a specific other but accounts for generalized interactions (e.g. meetings), practices (e.g. communication channels for conflicts). This dimension captures the level of satisfaction that employees have with how well the communication system works in an organization. This dimension puts the locus of communication control outside the individual and at the organizational level in terms of the effect that the "entire communication system" has on them personally (Clampitt & Girard, 1987). With this description in mind, it is possible to discuss how this construct relates to the dimensions of communication competence.

In general, since this dimension accounts for communication from an organization to an individual, only those dimensions that are most concerned with information requesting, receiving, and processing are going to be positively related. The remaining competence dimensions are argued to be unrelated. Of the cognitive skills, the appropriateness, interaction management, and language structure skills are likely to be positively related. These skills facilitate the requesting and processing of information about the organization which could increase the amount, accuracy, and

possibly the types of communication provided by the organization. Thus, a person high in these skills is more likely to be satisfied with the organization's communication effectiveness than a person low in these skills, since he/she is not as efficient in requesting or processing information. The remaining cognitive skills are argued to be unrelated, since perspective taking and response repertoire are irrelevant for communication that originates at an organizational level and which is usually processed through a variety of channels.

The behavioral skills that are positively related to communication effectiveness are articulation and listening. Skill in articulating is argued to be necessary for requesting information, while listening and the above mental skills allow for one's ability to receive and process information. Again, a person high in these skills is more likely to be satisfied with the organization's communication. The remaining behavioral skills are argued to be unrelated since expressiveness and reading nonverbals are not going to effect information exchanges between an organization and an individual.

Motivators are also argued to be unrelated to communication effectiveness. This is because there is no direct relationship between one's motivation to communicate and the organization's effectiveness at communicating. The relationship between being motivated and being satisfied with communication effectiveness is moderated by a number of factors such as the person's skills, the availability of organizational communication, the structure and practices of communication in the organization, etc. Thus, with so many potential moderators between the two variables, it is argued that they are unrelated.

The next communication satisfaction dimension is corporate information. As with communication effectiveness, this dimension is primarily at an organizational level and is operationalized by Clampitt and Girard (1987) as information about the corporation's accomplishments, conditions, activities, changes, policies etc. This dimension deals with the broadest kind of information about the organization as a whole (Clampitt & Girard, 1987). Again, this puts the locus of communicative control at the organizational level. It also suggests that the relationship between competence and this variable is going to be moderated by how accessible the organization makes this information.

With these considerations in mind, the same arguments hold true in this case as did in the previous communication satisfaction dimension. For cognitive skills, the appropriateness, interaction management, and language structure skills are going to be positively related. These skills are most necessary for requesting and processing information. The remaining cognitive skills are not as essential and are thus argued to be unrelated.

For behavioral skills, the articulation and listening skills should be positively related while the remaining behavioral skills should be unrelated. Again the reasoning being that articulation and listening skills are the most relevant for information requesting and receiving when the interaction is between an individual and an organization.

Similarly, the motivators are not expected to be related to this variable since the link between motivation and satisfaction with corporate information is so indirect.

The next communication satisfaction dimension is more interpersonal in nature and is concerned with satisfaction with supervisory communication. This

dimension puts the locus of communicative control on the supervisor and is operationalized by Clampitt and Girard (1987) as the degree to which a supervisor listens, is open, offers guidance, etc. Although this construct primarily looks at how satisfied a person is with his/her supervisor's abilities and behaviors, it still provides a more direct association between communication competence and supervisory communication. This is because an employee can more directly affect their interactions with his/her supervisor than he/she can with his/her overall organization. Of course, the point still needs to be made that just because an employee communicates competently does not mean that the supervisor will communicate in a satisfactory manner.

It is argued that since this communication satisfaction dimension is primarily concerned with the supervisor's ability to listen or offer guidance, the more competent a person is at sending ideas/information that is supervisor-oriented, the more likely the supervisor is to listen. In addition, the better the subordinate is at managing the interaction, the more likely he/she is to get guidance from the supervisor. This suggests that all of the cognitive skills of appropriateness, interaction management, perspective taking, response repertoire, and language structure are going to be positively related. The skills of appropriateness, perspective taking, response repertoire, and language structure are necessary for sending messages that the supervisor will listen to, while the interaction management skill would help the subordinate to get guidance from the supervisor. Support for the relationship of the interaction management dimension is implied from Spitzberg and Hecht's (1984) finding that interaction management is positively related to interpersonal communication satisfaction. The above arguments suggest

that a person high in the above skills is more likely to be satisfied with the supervisory communication. Of course, this argument assumes that the supervisor is willing and able to provide employee's with attention, guidance, etc.

In regard to the behavioral skills, the articulation skill is likely to be positively related since this skill is necessary for sending appropriate, well-constructed messages designed to be listened to or solicit guidance. The expressiveness skill is argued to be unrelated since it is doubtful whether one's expressions are going to get a supervisor to listen or offer guidance unless he/she is predisposed to. The link between expressiveness and the supervisor's performance is considered too weak to be positively related. The same holds true for listening and reading nonverbal skills. Although these are necessary for such things as perspective taking and determining appropriate responses the link again is not direct between these skills and a supervisor's performance. Thus, they are argued to be unrelated. For the same reason, the employee's motivation to communicate competently is not likely to be directly related to the supervisor's abilities and attitudes.

The last dimension of communication satisfaction is concerned with feedback. Again, this dimension is concerned with communication that is controlled by others or by the organization. Clampitt & Girard (1987) operationalize this as information about one's progress, efforts, job, etc. As with the previous dimensions, the relationship of feedback to communication satisfaction is going to be moderated by availability. In addition, an employee's satisfaction is also going to be a function of the attractiveness of the evaluation. This suggests that if information is available, then a competent communicator is going to be more effective at getting and processing that information. Yet, that doesn't mean he/she will be satisfied. He/she

is likely to be satisfied only if it is positive. Since this communication satisfaction dimension has an underlying attitudinal concern (e.g., is the feedback positive?), and is perceived to be moderated by availability, the links are considered weak between this dimension and one's communication skills and motivation. Thus, each of the communication skills and motivators is predicted to be unrelated to communication satisfaction with feedback.

Given this description of how the communication competence dimensions relate to variables within the nomothetic network, it is now possible to provide the last hypothesis, which is based on the predicted matrix in Table 2.

H4: The proposed 11 dimensions of communication competence will relate to the nomothetic network in the predicted manner.

Finding support for the proposed hypothesis would be useful, since empirical verification of the relationships of these variables to the dimensions of communication competence would help validate the proposed communication competence measure and model, and contribute to this paper's purpose of providing a useful conceptualization of communication competence and the goal of testing the proposed relationships between the communication competence dimensions and the nomothetic network.

As can be seen, the preceding sections have all contributed to the above purpose by providing a thorough review of the literature to illustrate the value of the proposed definition and model of communication competence. The preceding sections also fully developed the proposed components and dimensions, their interaction and relationships with each other, and how these components and dimensions relate to variables in the nomothetic network. In addition to developing the model and its relationships, this chapter also predicts that the nine skill

dimensions and two motivation dimensions are distinct dimensions of communication competence, are all positively related to each other, and that these dimensions all relate to the variables in the nomothetic network in the predicted manner. With this in mind, the following research design was developed.

CHAPTER TWO: METHODS

Purpose

The purpose of this design is to achieve the goals of this paper by determining if the proposed taxonomy of communication competence dimensions is supported, the relationships among the dimensions are supported, and if the proposed relationships between the communication competence dimensions and variables in its nomothetic network are also supported (see Appendix A for a list of research Questions and Hypotheses). To more adequately attain this purpose, this section discusses the sample used for this study, the procedures undertaken to get the sample and conduct the study, the development of the communication competence measure, the choice of measures for the nomothetic variables, and the analyses used to get the results.

Sample

The population of this study consisted of 550 salaried/white collar members of a large Midwestern automotive manufacturer. The salaried members of this organization range in age from 23 to 68 years of age with the average age being 43 years. Salaried members range in tenure from 0 to 42 years with the average tenure being 18 years. Salaried members education ranges from completion of grade school to completion of graduate school with the mean being completion of an undergraduate degree. Most of the salaried members are male (88% male), and most of them are caucasian (90% caucasian).

Although the salaried population of this organization is slightly higher than 550 members, the executive board which allowed access to the organization requested that the finance and personnel departments not be included. The reason cited by the executive board was that these two departments consist of too few

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people for study. A review of the list of salaried employees reveals that these departments are indeed small (personnel is seven people) and it is argued here that the exclusion of these departments does not hinder the ability of the sample to represent the salaried personnel. Thus, the population of this study was 550 people.

From the list of 550 salaried personnel provided by the organization, 20 employees were systematically chosen (by taking every nth name) to be interviewed. This comprised the interview sample. To get a survey sample, every other name was picked from the remaining 530 names. The result was a survey sample that consists of approximately 265 salaried members representing a diversity of departments and management levels. The departments represented were product engineering, materials and plant management with the sample members of these departments consisting mainly of supervisors, managers, and engineers. The three departments were located in three different locations of this automotive division which has in addition to the salaried personnel, 2400 nonsalaried personnel.

Procedures

To initiate the study, permission to study members was obtained from the executive board of the company. Once access was obtained, a list of all 550 salaried members was procured and 20 members were systematically selected (using every nth name on the list) for an audiotaped interview. Phone calls were made to arrange interview times. If a person was unavailable or had transferred, quit, etc. another name was selected from the list using the same method. A 20-30 minute personal interview was held with each of the 20 members. The interviews began with a brief statement by the researcher emphasizing that the purpose of the interview was to

determine which communication skills and motivators were necessary for communication competence at that organization and that all statements would be confidential. Once the introduction and purpose were completed, the actual interview consisted of a series of open-ended questions to determine the members' perceptions of which skills characterize a competent or "ideal" communicator in their department. The questions (see Appendix B) were structured to elicit both molar items (general/global behaviors such as openness, speaks well, etc.) and molecular items (specific behaviors such as gestures frequently, maintains eye contact, etc.). In addition, interviewees were asked to describe what types of outcomes motivate an employee to behave competently. Follow-up questions to the structured questions were used to flesh out responses. The interviews were taped and transcribed for analysis.

The information gathered from the interviews provided a pool of items which reflected the dimensions of the model and was used as a basis for developing the questionnaire. Relevant items were added to previously supported measures of communication competence (see Wright, 1990) and motivational outcomes (see Lawler & Suttle, 1973). The revised communication competence questionnaire (see Appendix C) was distributed to all 265 members of the sample via the internal mail and included a cover letter, statement of confidentiality, demographic questions, and a return addressed/stamped envelope. Follow-up reminders (see Appendix D) were sent to respondents a few days later.

Instrumentation

The basis for the communication competence measure used in this study, was a 37-item measure of communication competence developed by Wright (1990)

that was shown to be reliable and to partially reflect the proposed dimensional scheme. This previously used measure contained skill items taken from extant measures found in the literature and from interviews with consultants and trainers. Items from extant measures were derived by reviewing previously used scales (e.g. Spitzberg and Hecht, 1984; Cegala, 1981; Wiemann, 1977; Rubin, 1985; and others). Items were taken from extant measures if they had face validity with the proposed dimensions, and if their factor loadings, means, and/or reliabilities were acceptable. In addition to skill items taken from extant measures, the previously supported measure by Wright (1990) contained items that were a product of extensive interviews with organizational consultants and trainers using the same format and procedures as already described.

The 37-item previously supported measure provided a framework for categorizing responses from the automotive company interviews. The transcribed interviews were reviewed and skill items and motivational outcome items developed from the interviewee's responses. Relevant skills cited by employees were added to the appropriate dimension of the previously tested 37-item scale. The result of adding the interview items to the previously tested 37-item measure was a revised 89-item communication competence skill assessment instrument (see Appendix C) that incorporates all relevant extant skill items as well as communication skill items identified by employees of the target organization. This process accounts for the development of items measuring the skills dimensions of communication competence.

The process was quite similar for developing items to measure the motivational dimensions of communication competence. A review of extant

motivational measures was conducted and an intrinsic and extrinsic motivational measure that was generated and empirically supported by Lawler and Suttle (1973) was adopted. Using the Lawler and Suttle (1973) measure as a framework, relevant items from interviews with automotive employees were added. The result was a 30-item measure of intrinsic and extrinsic motivation. This process accounts for the development of items measuring the motivational dimensions of communication competence. Together, the skills and motivational measures combine to create the 119-item communication competence instrument used in this study.

This communication competence measure requires the respondent to identify how descriptive each skill item is of him/herself. Responses for the self-report were recorded using a seven-point, Likert-type scale ranging from "Not at all Descriptive" to "Very Descriptive." The motivational outcome portion of this measure uses the same format. This measure requires respondents to identify how descriptive each outcome is in motivating him/herself. Responses for the self-report were recorded using a seven-point, Likert-type scale ranging from "Not at all Descriptive" to "Very Descriptive."

Communication Apprehension was measured using the PRCA 20 (McCroskey, 1982b). This multidimensional scale has been shown to be a reliable (alpha = .86, .88, .83, .85 for the groups, meetings, conversations, and speeches dimensions respectively), internally consistent (mean absolute deviation was .04), and parallel (mean absolute deviation was .02) by Levine and McCroskey (1990). The adapted 20-item scale asks respondents to identify how descriptive each item is of them using a seven-point scale ranging from "Not at all Descriptive" to "Very Descriptive."

Role Ambiguity was measured using an extant role ambiguity measure. This measure is an adaption of the Rizzo, House, and Lirtzman (1970) scale. Schuler et al. (1977) found consistent support for this scale across six different samples and illustrate that this scale is reliable and has been widely used. Although Tracy and Johnson (1981) caution that this scale may also measure role discomfort, the internal reliability and dimensionality of the scale has been proven in previous research by such authors as Szilagyi, Sims, and Keller (1976) who found a internal reliability coefficient of .90; Valenzi and Dessler who found a reliability of .76; and Schriesheim and Van Glinow (1977) who obtained a Kuder-Richardson reliability coefficient of .89 (Cook, Hepworth, Wall, & Warr, 1981). The adapted scale requires respondents to identify how true each item is of them using a seven-point scale ranging from "Very False" to "Very True".

Job Identification was measured using an extant measure by Buchanan (1974) which is based on a measure by Hall, Schneider and Nygren (1970). The six-item measure has been shown to be reliable by Buchanan (1974) who obtained a Cronbach's Alpha of .86 for this scale. The job identification scale asks respondents to identify how strongly they agree with each item using a seven-point scale ranging from "Strongly Disagree" to "Strongly Agree."

Empathy - Communicative Responsiveness was measured using an extant measure of communicative responsiveness developed by Stiff (1984). This five-item scale has been shown to be reliable and valid by Stiff et al. (1984) who found that the scale had an alpha of .70 and "met the criteria of content homogeneity, internal consistency, and parallelism" (p. 9). The communicative responsiveness scale asks

the respondent to identify how descriptive each item is using a seven-point scale ranging from "Not at all Descriptive" to "Very Descriptive."

Communication Satisfaction was measured using an extant scale by Clampitt and Girard (1987) which is a shortened version of the one developed by Downs and Hazen (1977). This 22-item multidimensional scale contained four factors with factor loadings of .50 and above for items within factors and eigenvalues of 1.1 or higher for each factor. These factors were shown to be stable across a number of samples (Clampitt & Girard, 1987). The measures for each of the scales asks respondents to identify how much satisfaction they get from communication in their organization using a 7-point scale ranging from "No Satisfaction" to "Maximum Satisfaction."

Analyses

In general, after the results were tabulated, they were analyzed using confirmatory factor analysis (PACKAGE) (Hunter & Lim, 1987), exploratory factor analysis and correlational analysis. Confirmatory factor analysis was used to determine the dimensionality of the proposed factors. It was decided that the proposed factors would be supported if the items had face validity, and if the factors were internally consistent (using both the Spearman test and flatness test), parallel (using the Spearman test), and reliable (using Cronbach's alpha). Meeting these four criteria is considered the necessary criteria for dimensionality and quality scales (see Hunter, 1980; Hunter & Gerbing, 1982; Stiff et al, 1990). With the exception of face validity, data reflecting the other three criteria is provided by PACKAGE. Exploratory factor analysis was used to help determine the distinctiveness of the proposed dimensions. The next section more fully explains how factor analysis is used to determine distinctiveness among dimensions.

The validity of the measure will be determined by analyzing the relationship of the construct to a wide range of variables within its nomothetic network. This is consistent with Cronbach and Meehl (1955) who claim that to assess construct validity, it is necessary to compute correlations between the target variable and measures representing its nomothetic network. To the extent that the correlations reflect the conceptual predictions, the validity of the measure is supported (Cronbach & Meehl, 1955). Thus, the criteria for supporting the validity of the construct is that the observed relationships among variables must adequately reflect the predicted relationships.

Analysis of Research Questions and Hypotheses

To answer research question one and hypothesis one, the results for the self-reports were subjected to factor analysis. Confirmatory factor analysis helped determine which cognitive and behavioral communication skills employees used to describe communication competence at their organization. The items comprising the skill dimensions were considered to describe a "competent communicator" if they passed the four previously mentioned criterion for quality scales (face validity, internal consistency, parallelism, and reliability) and the factors had relatively high means indicating that employees considered these factors to be "descriptive" of communication competence. This process helped to determine which skills employees use to describe communication competence (R:1). Confirmatory factor analysis as well as exploratory factor analysis was used to determine if the skill dimensions were conceptually and empirically distinct (H:1). Dimensions were considered conceptually distinct if their definitions did not conceptually overlap. Dimensions were considered empirically distinct if the items comprising the skill

dimensions did not combine to form a first-order unidimensional factor using exploratory and confirmatory factor analysis, and if the proposed factors did not combine to form a second-order unidimensional factor of competence using confirmatory factor analysis. If it was found that the proposed factors did not comprise a first-order unidimensional solution (using items from the nine skill factors), and if they did not comprise a second-order unidimensional solution (using the factors) then hypothesis one would be supported and the factors considered distinct. If it was found that there was no first-order solution but there was a second-order solution, then hypothesis one would be considered partially supported and the proposed factors considered semi-distinct. If the skill items formed a first-order unidimensional solution, and the proposed factors formed a second-order unidimensional solution, then hypothesis one would be unsupported and the factors considered non-distinct.

To answer research question two and hypothesis two, the results for the self-reports were again subjected to confirmatory factor analysis. The dimensions were considered to be descriptive of a "competent communicator" if they passed the four above mentioned tests for quality scales and had relatively high means. This process helped to determine which dimensions employees consider to motivate them to communicate competently (R:2). As with the skill dimensions, the motivational dimensions were considered distinct (H:2) if they were found to be conceptually distinct, and empirically distinct according to the above mentioned criteria.

To answer hypothesis three, correlational analysis was used to compare the individual dimensions of communication competence with each other. If the

observed correlations were consistent with the predicted correlations and statistically significant at the .05 level then the relationships were considered to be supported. This helped to determine if the competence dimensions related to each other in the predicted way.

To answer hypothesis four, correlational analysis was used to compare the communication apprehension factors, role ambiguity, job identification, communicative responsiveness, and communication satisfaction factors with the communication competence dimensions. If the observed correlations were consistent with the predicted correlations and statistically significant at the .05 level then the relationships were considered to be supported. This helped determine if each of the proposed communication dimensions relates to the nomothetic network in the predicted way and contributed to validating the construct.

In summary, this chapter has provided the methods for studying the proposed model of communication competence. This study will use interview and survey research at a large Midwestern automotive plant to develop and test the proposed measure and model of communication competence. The quality and distinctiveness of the predicted dimensions will be determined using factor analysis, while the relationships among dimensions, and between the dimensions and variables in the nomothetic network will be determined using correlational analysis.

CHAPTER THREE: RESULTS

The following chapter will provide results on sample characteristics and on the dimensions of the communication competence scale and scales representing variables in the nomothetic network. In addition, this chapter will also provide results on the test of research questions and hypotheses.

Sample

After completing the interviews, it was found that the interview participants were basically representative of the salaried population in terms of age, tenure, sex, race, management level and department. Interview participants ages ranged from 26 through 65 (range for this population is 23-68 with the mean being 43). Participants tenure ranged from 7 to 30 years (range for this population is 0-42 with the mean being 18). Interview participants sex was predominantly male (88% of population is male). Participants were predominately caucasian (90% of population is caucasian). In addition, interview participants also represented a variety of management levels and each of the three target departments (Product Engineering, Materials, and Plant Management). The above data, although not providing an exact overlap, does illustrate that the interview participants approximate the characteristics of the salaried management population and are basically representative. Kerlinger (1986) points out that if a sample has relatively the same proportions of relevant demographic variables as the population then there is evidence that the sample is representative.

In terms of the demographic questions asked in the survey, the survey sample is also representative of the population. Of the 265 people sampled in the survey mailing, 103 responded with completed questionnaires. This constituted a 39% response rate. For the two demographic questions asked in the survey

(educational level, and tenure), it was found that survey participants were basically representative of the population of salaried personnel. The average educational level of salaried personnel is an undergraduate degree which is the same as the average educational level of survey participants. The average tenure of salaried personnel is 18 years, while the average tenure of participants is about fifteen years with the mode response being twenty years or more. Again, the relatively similar proportions of demographics variables suggests that the survey sample is also basically representative of the salaried population at this company. The use of a greater number of demographic questions may have further illustrated the basic representativeness of the survey sample.

Communication Competence Scale

As mentioned, the self-report responses were subjected to confirmatory factor analysis (CFA) using PACKAGE (Hunter & Lim, 1987) to determine the quality of the scales. A CFA was used instead of an exploratory factor analysis (EFA) for three main reasons. First, CFA is a more appropriate technique for confirming dimensions in an a priori model. Alternatively, EFA is traditionally used when a researcher does not have a clear conception of what the factor structure should look like but would like to explore some possibilities. Thus, CFA is a more appropriate analysis for confirming the dimensions hypothesized in this research. The second reason CFA was used is because it provides more useful information about the quality of items than does an EFA. Using the Spearman internal consistency and parallelism tests, CFA provides the researcher with information about which items are consistent with a particular scale and which items should be dropped. Thus, CFA is more useful in cleaning scales. A third reason that CFA is more useful is that

it provides all the necessary empirical information (reliability, internal consistency, and parallelism) for determining the quality of scales which is not available using EFA.

Given the relative value of a CFA, the communication competence scale was analyzed using CFA to determine the quality of the proposed scales. Again, the four criteria used for determining the quality and dimensionality of scales are, face validity, internal consistency, parallelism, and reliability.

An item has face validity if the content of that item is relevant and representative of the construct it is measuring (Kerlinger, 1986). This suggests that all items in a unidimensional cluster should have the same or similar meaning (Stiff et al., 1988). This is primarily a conceptual criterion and can be determined by comparing the item to the conceptual definition of the factor it is measuring.

The remaining three criteria are empirical criteria and are provided by PACKAGE (Hunter & Lim, 1987). The first criterion is internal consistency. Internal consistency is determined by comparing the correlations predicted from factor loadings (predicted correlations) with the observed correlations. If the deviation between predicted and observed is within sampling error (5%) the data is said to fit the model (Levine and McCroskey, 1990). Thus, for this study's purpose, the proposed skill dimension should not contain more deviations than would be expected by chance (5%). This means that a particular dimension should not have more than 5% of its observed correlations significantly deviating from their corresponding predicted correlations. This criterion provides an empirically acceptable target for internal consistency.

Another test of internal consistency that is provided by PACKAGE is the flatness test. With this test, correlations among items in an internally consistent factor will be equal, within sampling error for each of the proposed dimensions (Stiff et al. 1990). As with the previous test of internal consistency, it is desirable that not more than 5% of the observed correlations significantly deviate from the expected correlation.

The same decision rule as used for the Spearman test for internal consistency applies to the Spearman test for parallelism. The parallelism test determines if each item in a particular dimension correlates with a different construct in a manner similar to other items within that particular dimension (Levine & McCroskey, 1990). Again, this test is determined by comparing the predicted with observed correlations and if the deviations are small enough to be explained by chance variation, then the model is said to fit the data (Levine & McCroskey, 1990). Thus, for a particular dimension to be considered acceptable according to this test, the total number of significant deviations should be less than 5%. Again, this is an appropriate criteria since a higher cutoff than 5% would suggest problems with the measure. The final criterion for a quality scale is its reliability.

Using the above four criteria for determining the quality of items and factors, it is possible to determine the value of the initial results. The initial results of the 119-item communication competence measure did not support the proposed model due to problems with internal consistency and the factor loadings of specific problem items. Items that did not have factor loadings above .5 were deleted (see Appendix F - scale residuals). In addition, many items had deviations in internal

consistency that were greater than would be expected by chance. These items were also deleted (see Appendix F) after a thorough check of the item's face validity.

The resulting 97-item scale contained five or more items per factor. The reliability coefficients of these factors was .87 or higher and the factor loading of items was .52 or higher for each of the nine skills dimensions and the two motivation dimensions. Each factor was internally consistent according to the Spearman test (the total number of deviations per factor was 0%). The internal consistency Spearman test results were within sampling error. Many of the factors were also consistent according to the flatness test, although some had deviations that were greater than 5% (.e.g expressiveness 33%). At this point in the process, the flatness problems were noted and monitored as the analysis continued with a test of parallelism. Yet, it is important to note that so far, the 97-item scale basically satisfied the criteria for internal consistency (according to the Spearman test), and reliability.

Next, the scale was subjected to a test of parallelism. Tests of parallelism among factors did not support the proposed model. These tests were conducted by comparing all the factors in a given component with all the other factors within that component as well as an outside factor such as role ambiguity or job identification. Role ambiguity and job identification were chosen because these two scales were internally consistent according to the Spearman Test (see Table 3) and had a small number of items. Small scales were necessary because of the limitations of PACKAGE which can only accommodate 40 variables at a time.

The Spearman test for parallelism illustrated problems with items deviating from the predicted correlation more than would be expected by chance. To alleviate

the parallelism problems, specific problem items (those that exhibited clear patterns of significant deviations above chance) were dropped (see Appendix F) after a thorough check of the item's face validity. The result was eleven parallel communication competence factors. The total number of deviations in parallelism for each factor was 5% or less for all factors except for the behavioral dimensions which were all 6%. At this point, it was decided that the factors basically met the criteria of parallelism. No further items were dropped from the behavioral dimensions because it was believed that the marginal return of dropping items from scales with a small number of items (4) to attain a level of 5% was not worth the corresponding costs of reduced reliability and stability.

The parallel factors were also internally consistent according to the Spearman test with all factors containing no deviations (see Table 3). As mentioned, those factors with flatness problems in internal consistency were monitored throughout the parallelism process to see if the items with flatness problems were eliminated as a result of the parallelism test. Table 3 illustrates that certain factors (e.g. articulation, expressiveness) continued to have flatness problems. It was found that those factors with a higher than acceptable percentage of deviations in flatness had certain strong items (those with high communalities) which were causing weaker items to deviate. As can be seen in Table 3, most of the flatness problems were in dimensions that contained only a small number of items (usually about 4). Dropping these items to satisfy the flatness test would destabalize the factors and lower the power in the reliability estimate, as well as eliminate items that were conceptually valuable to that factor. Since the factors had already passed the Spearman test for internal consistency and it was considered that the flatness problems were the result of

strong items pulling weak ones, it was decided that dropping additional items in order to pass the flatness test was not worth the cost in reliability, stability, or conceptual value.

Yet, the result of these analyses still illustrate that the retained 62-item scale (see Appendix E) has basically met the criteria of internal consistency (Spearman test), parallelism, and reliability, suggesting that these are quality scales according to Hunter & Gerbing (1982). Although the face validity of items was checked throughout, each of the retained items was checked again against the conceptual definition of its respective factor. A glance at Appendix E illustrates that the items also appear to pass the test of face validity. This suggests the retained scale best fits the proposed model since it basically passed the four criterion for determining dimensionality and quality scales. In addition, as can be seen in Table 4 the means for each factor are relatively high suggesting that employees at this organization perceive each of these dimensions "descriptive" of a competent communicator. Yet, it is important to note that although the proposed dimensional scheme is cleanly revealed in the retained scale, the factors are highly intercorrelated, .5 or above for all the dimensions except for extrinsic motivation dimension and one of the expressiveness correlations (see Table 5). This suggests that the dimensions may not be distinct and is investigated further in a later section.

In summary, the retained communication competence scale basically meets the criteria for quality scales in terms of face validity, factor loadings, internal consistency (Spearman Test), parallelism, and reliability. The retained scale contains 62-items (see Appendix E) with at least 4 items per factor. The factors all had reliability estimates of .78 or above and were internally consistent according to the

Spearman test (total deviations for each factor were 0%). In addition, the majority of the factors passed the flatness test (although some dimensions had a percentage of deviations that was higher than desired). Appendix G provides the Spearman test internal consistency matrices for the retained items. The eleven factors were also basically parallel (the factors had 5% or less deviations except for the behavioral dimensions which had 6% or less). The factors are also intercorrelated.

Nomothetic Network Scale

In addition to checking the quality of the communication competence scale, it was also necessary to check the quality of the extant scales used to measure the nomothetic network. The communication apprehension, role ambiguity, job identification, empathic-communicative responsiveness, and communication satisfaction scales were subjected to confirmatory factor analysis to determine if the scales were reliable, internally consistent, and the factor structure of communication apprehension and communication satisfaction supported.

The job identification scale had one problem item. The problem item had a low factor loading (.36) and was causing significant deviations in the Spearman and flatness tests for internal consistency. The item was dropped. The communication apprehension scale had two problem items both located within the speeches dimension. These items were causing problems with the Spearman and flatness tests for internal consistency. They were dropped. These were the only changes in the extant measures. The result was clean extant measures. The scales/factors were reliable with an alpha of .84 or above and had factor loadings of .5 and up. The scales/factors were also internally consistent according to the Spearman test (total deviations per factor were 1% or less). And although a look at Table 3

Table 3

Reliability, Internal Consistency, and Parallelism Estimates for The Communication Competence and Nomothetic Network Factors

Factors	Reliability	Spearman	Flatness	//ISM
Communication Competence Dimensions				
Appropriateness (AP)	.91	0%	5%	3%
Interaction Mgmt. (IM)	.91	0%	13%	5%
Perspective Taking (PT)	.84	0%	7%	4%
Response Repertoire (RR)	.86	0%	10%	5%
Language Structure (LS)	.85	0%	17%	5%
Articulation (AT)	.88	0%	17%	6%
Expressiveness (EX)	.89	0%	33%	6%
Listening (LI)	.78	0%	0%	6%
Reading Nonverbals (NV)	.91	0%	0%	6%
Intrinsic Motiv. (IN)	.82	0%	0%	4%
Extrinsic Motiv. (EM)	.80	0%	0%	0%
Communication Apprehension Dimensions				
Groups = CAGR	.89	0%	20%	
Meetings = CAMT	.90	0%	30%	
Conversations = CACV	.84	0%	30%	
Speeches = CASP	.90	0%	0%	
Role Ambiguity = RA	.90	0%	27%	
Job Identification	.86	0%	30%	
Empathic Comm. Responsiveness = ECR	.91	0%	20%	
Communication Satisfaction Dimensions				
Communication Effectiveness = CSCE	.86	0%	4%	
Corporate Information = CSCI	.87	0%	13%	
Supervisory Communication = CSSC	.93	0%	0%	
Feedback = CSFD	.89	0%	0%	

Note: Percentages reflect the % of significant deviations for that factor.

illustrates that many of these scales had problems with flatness (e.g. job identification had 30% deviations), there was no attempt to alleviate these flatness problems for a number of reasons. First, these scales also had strong items causing deviations in weak items. Second, the scales had no deviations in internal consistency according to the Spearman test. Third, the factors only contained a few items (e.g. 4) and dropping items would effect stability and reliability. And fourth, it was beyond the scope of this paper to extensively clean extant measures that are basically considered acceptable in the current literature.

Aside from the lack of perfection in flatness tests for internal consistency, the above results provide support for the reliability and factor structure of the extant measures. Given that the nomothetic and communication competence scales basically meet the criteria for quality scales, it is now possible to address the research questions and hypotheses posed earlier.

Test of Research Questions and Hypotheses

In general, the proposed research questions and hypotheses were concerned with empirically supporting and validating the proposed model of communication competence. More specifically, the hypotheses were concerned with whether the nine skill dimensions and two motivational dimensions were considered distinct dimensions that were descriptive of communication competence and whether the proposed relationships were supported among competence dimensions, and between competence dimensions and variables in the nomothetic network.

Research Question One

The first research question was concerned with determining which of the proposed cognitive and behavioral communication skills employees use to describe

their communication competence. The results reviewed above demonstrate that employees at this company use all nine skill dimensions to describe their communication competence. Table 4 shows that the means for all skill dimensions were relatively high (4.4 or above) suggesting that employees perceive each skill to be descriptive of competence. No skill dimension fell out or was considered by these employees to be "Not at all Descriptive" of their communication competence. This supports the proposed taxonomy and provides an answer to research question one. Employees at this organization perceive the nine skills tested here to be descriptive of communication competence.

Hypothesis One

Hypothesis One suggests that the nine skill dimensions tested are distinct. Testing for distinctiveness becomes even more salient in light of the previously mentioned finding that the factors are all intercorrelated.

As already mentioned, for these dimensions to be distinct they need to be conceptually distinct and empirically distinct. Dimensions are considered to be conceptually distinct if the definitions that describe those dimensions do not overlap in conceptual content. This essentially means that no two dimensions describe the same skill. A look at the conceptual definitions provided in Chapter One reveals that the dimensions are clearly delineating specific behaviors or knowledge and that no dimensions overlap or account for the same skill. For example, the knowledge inherent in the appropriateness dimension (e.g. knowledge of contextual requirements) does not overlap with or account for knowledge in the perspective taking dimension (e.g. knowledge of how to take the role of the other). In addition, it is important conceptually that the items used to measure these dimensions do not

Table 4

Means and Standard Deviations for Communication Competence Dimensions

Dimensions	Mean	Standard Deviation
Cognitive Component		
Appropriateness (AP)	4.8	.88
Interaction Mgmt. (IM)	5.0	.87
Perspective Taking (PT)	4.7	.82
Response Repertoire (RR)	4.7	1.0
Language Structure (LS)	5.2	1.0
Behavioral Component		
Articulation (AT)	5.2	.99
Expressiveness (EX)	5.0	1.0
Listening (LI)	5.3	.86
Reading Nonverbals (NV)	5.2	1.0
Motivational Component		
Intrinsic Motiv. (IN)	5.7	.88
Extrinsic Motiv. (EM)	4.4	1.2

overlap and conceptually reflect only the definition of their respective dimension. This means not only that the items have face validity but also that the content of items in each dimension should be conceptually distinct from the content of items in other dimensions. A look at Appendix E (communication competence scale retained) illustrates that this is the case. Thus, the dimensions are said to be conceptually distinct.

Yet, a conceptual distinction does not necessarily mean the skill dimensions are empirically distinct. As mentioned, there are two criteria for dimensions to be considered empirically distinct. One, the skill items must form multiple dimensions

and not combine to form a single, first-order solution. And two, the skill factors must not combine to form a second-order factor. To determine the first-order factor structure of the data, confirmatory factor analysis was used whenever possible since this technique is more powerful and appropriate for the testing of an a priori model as already mentioned. However, in those analyses where the size of the measurement scales exceeded the limitations of the PACKAGE subroutine, exploratory factor analysis was used.

In the event that the CFA results did not confirm the hypothesis, indicating that the predicted factor structure was not apparent, exploratory factor analysis was used to determine if alternative solutions existed. To determine the second-order factor structure, confirmatory factor analysis was used.

With this criteria in mind, the first step would be to run a first-order confirmatory factor analysis on the skill items to determine support for hypothesis one. Unfortunately, PACKAGE was unable to perform this analysis due to the number of variables in the skills dimensions which exceeded the PACKAGE subroutine. Thus, a number of first-order exploratory factor analysis were conducted on the skill items (see Appendix I.1A and I.1B) to see if the predicted factor structure was apparent. The parameters used for this analysis included a pairwise missing value, principle axis extraction with an oblimin rotation which reflected the interrelated nature of the dimensions, and a principal components extraction with a quartimax rotation to help break out the dimensional structure by forcing them to be orthogonal. To ensure convergence, criteria subcommands were used for extraction (econverge of 0.01) and rotation (rconverge of 0.001) with the number of iterations set at 80. These parameters were used in each of the EFAs

conducted in this study. In addition, a decision rule of including items on a factor only if they have loadings of .50 or above was also used. This ensures that only relatively strong items are included on a factor. Of course, it is also important that items do not have double loadings, thus a 50/30 rule was used where an item that loads .5 or higher on one factor cannot load more than .3 on another. This rule is aimed at removing items that appear to measure more than one factor. An additional decision rule is only interpreting factors that have an eigenvalue of 1.0 or greater. This cutoff is considered acceptable for interpreting factors according to Norusis (1990).

The EFA using an oblimin rotation resulted in six factors that had eigenvalues of 1.0 or greater (see Appendix I.1A). The six factors accounted for 62% of the variance. Factor one had an eigenvalue of 24.4 and accounted for 46.1% of the variance. Oblimin took 17 iterations to converge and resulted in a pattern matrix that did not support hypothesis one. Of the 53 items analyzed, only 15 met the above mentioned criteria of a factor loading of .5 or higher and no double loadings. This suggests that the oblimin rotation was spreading the variance around the factors and not providing a clear factor structure for interpretation. For example, using the above mentioned criteria, only one interaction management item loaded on factor one. One appropriateness, one interaction management, and three expressiveness items loaded on factor two. No items loaded on factor three. Three listening items and one reading nonverbal item loaded on factor four. One response repertoire item loaded on factor five. And, two appropriateness items loaded on factor six. As Norusis (1990) points out, a good factor structure is both simple and interpretable. The oblimin solution provided a solution that was neither simple or interpretable.

Since no clear factor structure emerged to test the hypothesis, another EFA was run using an orthogonal quartimax rotation. Quartimax emphasizes a simple interpretation of variables and attempts to simply the number of factors a variable loads on (Norusis, 1990).

A quartimax rotation resulted in nine factors with eigenvalues greater than one which accounted for 72% of the variance (see Appendix I.1B). Factor one had an eigenvalue of 24.7 and accounted for 46.7% of the variance. The quartimax rotation took 24 iterations to converge and revealed a rotated matrix with all of the items loading on factor one at .5 or above. Although all 53 items met the first loading criteria for factor one, 16 of the items had double loadings. This suggests that the some of the items are capturing more than one dimension. Even with the double loadings, the quartimax rotation provides a more interpretable EFA than the oblimin and suggests that the skill items do not form the proposed multi-dimensional solution. This finding refutes hypothesis one since the more interpretable of the EFAs suggests a unidimensional tendency in the data. This suggests that the results do not meet the first criteria for distinctiveness.

Since the quartimax EFA revealed a unidimensional solution and the skills factors were intercorrelated (see Table 5), it was considered necessary to confirm this unidimensional tendency by running a second-order confirmatory factor analysis to see if the skill dimensions formed a second-order factor. This analysis revealed a relatively unidimensional solution with an alpha of .96, factor loadings of .77 and above, 17% deviations in the Spearman, and 22% deviations in the flatness test. A review of the data suggested that the language structure factor was causing some problems. Dropping the factor resulted in a cleaner unidimensional solution with

11% deviations in the Spearman test and 18% deviations in flatness. Although there appears to be some error in the data, the second-order confirmatory basically replicates the unidimensional tendencies found in the quartimax EFA. Since the results did not meet either criteria for distinctiveness, the skills dimensions are considered to be nondistinct.

Although the above analyses disconfirm hypothesis one, additional analysis were run to more fully understand the data. Confirmatory and exploratory analyses were run on cognitive items and then on behavioral items with basically similar results.

Cognitive Component

To test the dimensional nature of the cognitive items, a first-order confirmatory factor analysis (CFA) was run to see if these items formed a unidimensional solution. Appendix J.1 reveals that the items did form a unidimensional solution with an alpha of .97, factor loadings of .54 and above, 3% deviations in the Spearman internal consistency test, 10% deviations in the flatness test, and 3% deviations in the parallelism test. In the event that an alternative factor solution existed that was not considered in the literature review, first-order exploratories were also conducted.

The results of a first-order exploratory run on the cognitive items using an oblimin rotation (see I.2A) revealed three factors with eigenvalues greater than one accounting for 54.5% of the variance. Factor one had an eigenvalue of 17.4 and accounted for 47.1% of the variance. Oblimin converged in 16 iterations and again spread the variance across factors resulting in only 14 of 37 items meeting the above mentioned factor loading criteria. Although very few items loaded at .5 or

better, the majority of those that did meet the criteria loaded on factor one which contained two appropriateness items, seven interaction management items, two response repertoire items, and one language structure item. No items loaded on factor two, while two response repertoire items met the criteria and loaded on factor three. Since so few items loaded, it is hard to make an interpretation. Yet, those that did load seem to form a unidimensional solution suggesting that the cognitive component is also unidimensional. To test this further, an exploratory was run using a quartimax rotation.

A quartimax rotation resulted in five factors that had eigenvalues of greater than one and accounted for 64.4% of the variance (see Appendix I.2B). Factor one had an eigenvalue of 17.8 which accounted for 48.2% of the variance. Quartimax took five iterations to converge and resulted in a rotated matrix that represents a unidimensional cognitive component with all the items loading on factor one at .55 or above suggesting a single-factor solution. Although all 37 of the items loaded at .55 or above, there were ten items that had double loadings and appear to be tapping into more than one dimension. Although not perfect, both exploratories suggest that the cognitive component is unidimensional. This result is consistent with the CFA and does not provide any alternative solutions to the data or any support for hypothesis one.

Again the high intercorrelations among cognitive dimensions (see Table 5) suggest that these dimensions may also combine to form a second-order factor. To test this, CFAs were run (see Appendix H.4 and H.5). Not surprisingly, the cognitive skills formed a second-order internally consistent (after dropping the language structure dimension) unidimensional solution with no deviations in the Spearman

test, 17% deviations in flatness, and factor loadings of .59 and up. Thus, the second-order cognitive component confirmatory analysis supports the unidimensionality of the first-order analyses illustrating that the cognitive component is unidimensional.

Behavioral Component

Analysis was also done on the behavioral component. A first-order confirmatory analysis of the behavioral items (see Appendix J.2) yielded an alpha of .95, factor loadings of .55 and up, 8% deviations in the Spearman test, .23% deviations in flatness, and .3% deviations in parallelism. This suggests that the behavioral items also form a first-order unidimensional solution although the high percentage of deviations in internal consistency suggests some error in the data.

To see if alternative factors might exist, first-order exploratories were run on the behavioral items (see Appendix I.3A). The final results of the EFA using an Oblimin rotation revealed two factors that had an eigenvalue greater than one which accounted for 61% of the variance. Factor one had an eigenvalue of 8.7% and accounted for 54.4% of the variance. The oblimin analysis took 15 iterations to converge and resulted in 12 of the 16 items meeting the factor loading criteria. All of the expressiveness, one listening, and three reading nonverbals items loaded on factor one. Two articulation and two listening items loaded on factor two which had an eigenvalue of 1.0 and accounted for 6.7% of the variance. Although conceptually one might make the argument that the nonverbal items (expressiveness and reading nonverbals) are loading on factor one and the verbal items (articulation and listening) on factor two. This type of interpretation should be made with caution since listening is loading on both factors and 25% of the items did not load on either factor. Although this analysis did provide an alternative solution, the above cautions

suggest that an exploratory using a quartimax rotation be done to see if this alternative structure was replicated.

The quartimax rotation resulted in three factors with eigenvalues greater than one which accounted for 71.7% of the variance (see Appendix I.3B). Factor one had an eigenvalue of 9.0 and accounted for 56.4% of the variance. This analysis took 4 iterations to converge and resulted in all of the items loading on factor one at .55 or above. Although some of the items (six) had double loadings, this analysis suggests that the behavioral component is unidimensional. This is consistent with the previously mentioned CFA. Since the first-order quartimax exploratory supports the unidimensionality found in the first-order confirmatory of behavioral items, it is concluded that a unidimensional solution best fits the data for the behavioral component. To further confirm the unidimensional nature of the behavioral dimensions a second-order CFA was run to see if a second-order unidimensional solution also existed. This analysis resulted in a second-order unidimensional behavioral component (comprised of all behavioral dimensions) with no deviations in the spearman or flatness, and factor loadings of .59 and above (see Appendix H.6). Thus, the second-order behavioral component confirmatory analysis supports the basic unidimensionality of the first-order analyses.

The above exploratory and confirmatory findings suggest that the skill items form a unidimensional first-order solution and the skill factors form a unidimensional second-order solution. The end result of all these analyses is that hypothesis one is disconfirmed: the skill dimensions are empirically non-distinct. Although hypothesis one was unsupported, it is important to note that the findings addressing research

question one show that employees at this organization perceived all of the nine skills as descriptive of communication competence.

Research Question Two

The second research question was concerned with determining which motivational dimensions employees consider to motivate them to communicate competently. The previously mentioned findings illustrate that employees use both motivational dimensions to describe what motivates them. Table 4 illustrates that the means for the motivational dimensions were relatively high (4.4 or above) suggesting that employees consider both of these motivational dimensions to be descriptive of what motivates them to communicate competently. Neither of the motivational dimensions fell out or were considered by employees to be "Not at all Descriptive." This provides an answer to research question two. Members of this organization perceive both motivational dimensions to be descriptive of communication competence. But, does this mean they saw them as distinct?

Hypothesis Two

The same criteria for distinctiveness used to test hypothesis one were used to test hypothesis two. A look at Chapter One illustrates that the definitions that describe these dimensions do not overlap in conceptual content and clearly specify different types of motivational outcomes. For example, intrinsic motivators (e.g. a need to communicate well) are distinctly different from extrinsic motivators (e.g. recognition from a supervisor). In addition, the items used to measure these dimensions conceptually reflect only their respective dimension's definition (see Appendix E). Thus, these dimensions appear to be sufficiently distinct at the conceptual level.

In addition, it is also important that these two dimensions be empirically distinct. Thus the motivational items and factors were subjected to confirmatory and exploratory factor analysis in the same manner and using the same parameters as previously described.

A first-order confirmatory analysis of the motivational items (see Appendix J.3) revealed a unidimensional solution with an alpha of .86, factor loadings of .57 or higher, 6% deviations in the Spearman test, 16% deviations in the flatness test, and 3% deviations in parallelism. Thus, the first-order confirmatory analysis suggests that the motivational items form a unidimensional solution. Again, the predicted structure did not emerge indicating that the motivational factors did not meet the first criteria for distinctiveness. An exploratory analysis was conducted to determine if alternative factor structures existed.

Surprisingly, a first-order exploratory factor analysis using an oblimin rotation revealed the motivational items basically did form two factors although factor two's eigenvalue was less than the 1.0 cutoff (see Appendix I.4A). Factor one had an eigenvalue of 3.7 and accounted for 41.8% of the variance, while factor two had eigenvalue of .72 and accounted for 8.0% of the variance. The oblimin rotation converged after 6 rotations creating an interpretable two-factor pattern matrix that represented intrinsic motivation and extrinsic motivation. All the intrinsic motivator items loaded on factor one at .52 or higher with no double loadings. All the extrinsic motivator items loaded on factor two at .56 or above.

To see if the quartimax rotation replicated this finding, an additional run was made. This resulted in two factors with eigenvalues greater than one which explained 60.8% of the variance (see Appendix I.4B). Factor one had an eigenvalue

of 4.2 and accounted for 47.3% of the variance. Factor two had an eigenvalue of 1.2 and accounted for 13.5% of the variance. The quartimax rotation converged after 3 iterations creating an interpretable two-factor pattern matrix that represented intrinsic motivation and extrinsic motivation. All the intrinsic motivator items loaded on factor one at .65 or higher with only one double loading. And, all the extrinsic motivation items loaded on factor two at .65 or above with only one double loading.

Although the above exploratories provide partial evidence for the proposed dimensionality of the motivational component, it is important to note that the preponderance of proof is for a unidimensional solution since the confirmatory factor analysis is the more powerful of the two techniques and the low amount of variance explained in the EFA suggests a significant amount of error. Thus, the CFA suggests that the results do not meet the first criteria for distinctiveness. Yet, to confirm the factor structure of the motivational component and to determine if the results meet the second criteria for distinctiveness, a second-order confirmatory factor analysis was run.

Appendix H.7 reveals that the two factors combine to form a unidimensional second-order solution with no deviations in the Spearman test or flatness test. The fact that both confirmatories (first- and second- order) reveal that the dimensions form a unidimensional solution suggests that hypothesis two is also unsupported and the motivational dimensions are non-distinct. Although the above findings disconfirm hypothesis two they do provide an answer to research question two by showing that both dimensions were used to describe communication competence at this organization. In addition, the fact that both exploratories revealed the predicted

solution, suggests that future work should continue to investigate the proposed factor structure.

Overall Model

But, before moving on to a discussion of hypothesis three, the results so far suggest that communication competence is not a multi-dimensional model as predicted but is instead unidimensional. Although it could be argued that a component model may fit the data such that the cognitive skills comprise a unidimensional cognitive component, the behavioral dimensions comprise a unidimensional behavioral component, and the motivational dimensions comprise a unidimensional motivational component, it is considered here not to be the best fit for the data. This is because it has already been shown (see Appendix I.1B) that combining the cognitive and behavioral skills results in a unidimensional skills solution, suggesting that the components are not distinct. Thus, it was considered that analyzing dimensions from all three components would also result in a unidimensional solution.

To verify that a unidimensional model comprised of all three components or all 11 dimensions best fit the data, further factor analysis was conducted. Since a first-order confirmatory factor analysis of all items was not possible due to limitations with PACKAGE, a first-order exploratory was run using both skill and motivational items to see if these items were part of a first-order unidimensional solution or formed an alternative solution not hypothesized. An alternative solution could be possible since not all of the behavioral exploratories found a unidimensional solution, and the motivational exploratories found a two-factor solution.

The first-order exploratory using an oblimin rotation revealed seven factors with eigenvalues greater than one which accounted for 61.2% of the variance (see Appendix I.5A). Factor one had an eigenvalue of 26.7 and accounted for 43.1% of the variance. Oblimin took 24 iterations to converge, resulting in a rather uninterpretable factor structure with 47 of the 62 items not meeting the loading criteria. Again, it would seem that the variance is being scattered across factors preventing a clear solution. No items met the factor loading criteria for factor one. One appropriateness, four expressiveness, and two reading nonverbal items loaded on factor two. Three extrinsic motivation items loaded on factor three. One perspective taking item loaded on factor four. No items loaded on factor five. Three intrinsic motivation items loaded on factor six. And one appropriateness item loaded on factor seven. Again since so few items met the loading criteria (15 out of 62), and no interpretable factor structure emerged, a quartimax rotation was run to see if an orthogonal rotation could achieve a simpler, more interpretable structure.

A quartimax rotation resulted in eleven factors with eigenvalues greater than one which accounted for 72.6% of the variance (see Appendix I.5B). Factor one had an eigenvalue of 27.0 and accounted for 43.6% of the variance. This analysis took nine iterations to converge and revealed a basically unidimensional solution with all the items loading on factor one at .5 or above except two extrinsic motivation items (.28, and .38) suggesting that they are weak items. As with the skills EFA, many of the items (23) had double loadings suggesting that those items are measuring more than one dimension. Yet, the factor structure in this analysis is more interpretable and suggests that the overall model is unidimensional.

Although not as powerful as a first-order CFA, the first-order EFA suggests that no alternative structures exist and that the model is basically unidimensional and is comprised of all three components or 11 dimensions. Because of the high intercorrelations among the dimensions and the need to verify this unidimensional solution, a second-order CFA was run on the overall model.

The second-order CFA of all II factors (see Appendix H.1) also revealed a unidimensional solution. The single factor had a reliability estimate (.95) and factor loadings (.50 and up) that were acceptable. The analysis revealed some slight problems with the Spearman test for internal consistency (13% of the deviations were statistically significant) and the flatness test for internal consistency (40% of the deviations were statistically significant). These problems were reduced by dropping the language structure dimension (see H.2) which had one of the lowest communalities. This resulted in a relatively internally consistent second-order factor with only 7% deviations in the Spearman test and 38% deviations in flatness. Although it is argued in the next chapter that the items are not as precise as would be desired and that future refinement of the language structure dimension could result in a clean second-order solution, it is important to note that the second-order confirmatory factor analysis found a unidimensional solution for the model. And since the CFA supports the findings of the EFA, it is argued here that the preponderance of evidence points to a unidimensional model of communication competence.

Concluding that a unidimensional solution is the best fit for the data is reasonable considering that the confirmatory and the one interpretable exploratory found a unidimensional solution for the overall model. This is reflected in the

component analyses which revealed that all of the confirmatories and more than half of the exploratories resulted in a unidimensional solution. Only three analyses found a multidimensional solution - two exploratories that found a two-factor motivational solution and one exploratory that found a two-factor behavioral solution. Yet, it is important to note that all three of these analyses were contradicted by CFAs (both first- and second-order) which found unidimensional solutions. This provides overwhelming evidence that the model that best fits the data is a unidimensional solution that is comprised of all the skill and motivational dimensions. The means that the data does not support any alternative solutions, nor unfortunately, the proposed multi-dimensional model. With these results in mind, it is important now to discuss the remaining hypotheses.

Hypothesis Three

The third hypothesis concerned relationships between the 11 dimensions of competence. Since the previous findings all demonstrate the relative unidimensionality of the construct, this hypothesis becomes a moot point. Not surprisingly, a correlational analysis of the dimensions (see Table 5) illustrates that indeed the dimensions are all positively related as they should be since they are all measuring the construct of communication competence instead of separate, distinct dimensions of competence.

Hypothesis Four

The fourth hypothesis was concerned with whether the proposed 11 dimensions of communication competence relate to the nomothetic network in the predicted manner. In light of the results presented so far, the original predictions

Table 5

Predicted vs. Observed Relationships Among
Communication Competence Dimensions

Dimensions	AP	IM	PT	RR	LS	AT	EX	LI	NV	IN	EM
Cognitive Component											
Appropriateness (AP)	+ 1.0										
Interaction Mgmt. (IM)	+ .88	+ 1.0									
Perspective Taking (PT)	+ .87	+ .82	+ 1.0								
Response Repertoire (RR)	+ .80	+ .85	+ .70	+ 1.0							
Language Structure (LS)	+ .75	+ .73	+ .56	+ .78	+ 1.0						
Behavioral Component											
Articulation (AT)	+ .75	+ .80	+ .62	+ .76	+ .77	+ 1.0					
Expressiveness (EX)	+ .69	+ .68	+ .64	+ .67	+ .43	+ .70	+ 1.0				
Listening (LI)	+ .69	+ .73	+ .65	+ .68	+ .65	+ .71	+ .63	+ 1.0			
Reading Nonverbals (NV)	+ .69	+ .66	+ .64	+ .62	+ .51	+ .65	+ .78	+ .77	+ 1.0		
Motivational Component											
Intrinsic Motiv. (IN)	+ .67	+ .69	+ .65	+ .63	+ .58	+ .63	+ .60	+ .69	+ .61	+ 1.0	
Extrinsic Motiv. (EM)	+ .44	+ .41	+ .39	+ .43	+ .32	+ .34	+ .30	+ .36	+ .47	+ .57	+ 1.0

Note: All correlations were statistically significant at the .05 level.

made in Chapter One are no longer relevant. Thus, it is necessary to summarize predictions about how the 11 communication dimensions relate to variables in the nomothetic network into predictions about how the overall construct of communication competence relates to variables in the nomothetic network. Thus, the following paragraphs attempt to collapse the predictions made in Chapter One about how the communication dimensions relate to outside variables into predictions about how the overall construct of communication competence relates to outside variables.

A look at Table 2 illustrates that all of the communication competence dimensions are predicted to be negatively related to all of the communication apprehension dimensions. This suggests that the overall construct of communication competence should also be negatively related to the dimensions of communication apprehension. As Chapter One points out, anxiety hinders motivation and successful communication performance. It is argued that a person who is motivated and skilled in communicating is less likely to be anxious or apprehensive about communicating since he/she is more competent.

It was further predicted that all of the communication dimensions are negatively related to role ambiguity. Thus, the communication competence construct should also be negatively related to role ambiguity since a skilled, motivated communicator is better able to solicit, gather, receive, and process information about roles which can be used to decrease role ambiguity. This relationship is likely to be moderated by the availability of role-relevant information.

In regard to job identification, communication competence is predicted to be unrelated. Chapter One argues that there is no relationship since job identification is

considered to be a function of affective reactions to personal or organizational conditions and the congruence between a person's value system and that of the job or organization. This is not considered to be a function of one's communication skills. Although their affective reactions may be an indirect product of communication, the relationship is considered too weak to be significant.

The next variable in the nomothetic network is empathic-communicative responsiveness. The dimensional predictions in Table 2 suggests that communication competence should be positively related to empathic-communicative responsiveness since a motivated communicator, who is skilled in receiving information about an other and sending information to an other, is more likely to communicate in a manner that is responsive to an other's emotional state than is a unskilled, unmotivated communicator.

The predictions for how communication competence relates to the communication satisfaction dimensions is less clear. As argued, some dimensions should have been positively related, while others were argued to be unrelated due to the locus of communicative control, indirect links, or the availability of information.

In terms of the communication satisfaction communication effectiveness dimension, the prediction is that communication competence will be positively related. Those who are skilled in requesting, receiving, and processing information are likely to get more organizational information and thus be more satisfied with its effectiveness. Of course, since the communication is initiated at the organizational level, this relationship is considered to be moderated by the availability and the quality of the information.

The same prediction is made for the corporate information dimension. Communication competence is predicted to be positively related to corporate information. As with the previous dimension, those who are skilled in requesting, receiving, and processing information are likely to get more corporate information and thus be more satisfied. This is moderated by the locus of communication control being at the organizational level and the possibility that the information available may be limited.

The communication satisfaction dimension of supervisory communication is also predicted to be positively related to communication competence since a person who is skilled in sending information that is supervisor-oriented is more likely to get the supervisor to listen and provide guidance. Of course, this is moderated by the supervisor's willingness and ability to listen and provide guidance.

The final communication satisfaction dimension is feedback. The prediction made in Table 2 is that this variable is unrelated to communication competence since satisfaction with feedback is primarily an attitudinal variable that has weak links with communication competence. This relationship is also moderated by the availability of information and by the fact that communication is initiated by others or the organization.

Given these predictions based on arguments made in Chapter One, it is possible to determine whether the unidimensional model of communication competence relates to nomothetic variables in the predicted manner. To test this hypothesis, the extant measures/factors were subjected to correlational analysis with the 62-item unidimensional scale. The results are illustrated in Table 6, which shows the predicted relationship, the observed relationship, and the significance of the

correlations between competence and the nomothetic network factors. Since the predictions included positive, negative, and null relationship among factors, it was necessary to use a cutoff to determine when a correlation was considered unrelated. A correlation is considered unrelated if it is not statistically significant at the .05 level or below. This criteria ensures that the relationship between particular constructs is not a product of chance or sampling error. A look at Table 6 reveals that the majority of the predictions were supported although some of the correlations are not as strong as would be desired. The prediction that communication competence is negatively related to all the dimensions of communication apprehension was supported with correlations -.4 or above (p.<01) for each of the communication apprehension factors. The prediction that communication competence is negatively related to role ambiguity was somewhat supported (r= -.24) but was not statistically

Table 6

Predicted vs. Observed Relationships Between Communication Competence Dimensions and the Nomothetic Network

Dimensions	CAGR	CAMT	CACV	CASP	RA	JD	ECR	CSCE	CSCI	CSSC	CSFD
Comm. Competence	-	-	-	-	-	o	+	+	+	+	o
	-.48 **	-.38 **	-.46 **	-.50 **	-.24	.19	.60 **	.24	.20	.21	.13

Legend:

Communication Apprehension Dimensions
- Groups = CAGR
- Meetings = CAMT
- Conversations = CACV
- Speeches = CASP

Role Ambiguity = RA

Job Identification = JD

Communication Satisfaction Dimensions
- Communication Effectiveness = CSCE
- Corporate Information = CSCI
- Supervisory Communication = CSSC
- Feedback = CSFD

Empathic Communicative Responsiveness = ECR

** = P.<.01, * = P.<.05

significant. The prediction that communication competence is unrelated to job identification was also supported (r= .19) since it was not a significant correlation. The predicted positive relationship between communication competence and empathic-communicative responsiveness was supported (r= .60, p.<01). And, the relationship between communication competence and the communication satisfaction dimensions were also basically supported. Although the positive predictions between communication competence and communication effectiveness (r=.24), corporate information (r=.20), and supervisory communication (r=.21) were not statistically significant they were in the predicted direction. The prediction that communication competence was unrelated to feedback was supported (r=.13) since it was not a significant correlation.

The above discussion illustrates that all of the relationships were in the predicted direction, although some (role ambiguity, communication effectiveness, corporate information, and supervisory communication) were not statistically significant. The fact that the majority of the predictions were supported according to the criteria used here and those that weren't supported were related in the predicted direction provides evidence for the validity of the proposed construct.

Aside from the results that were below the required significance level, the majority of the predictions were upheld thus supporting the hypothesized relationships of communication competence dimensions to variables in its nomothetic network. Providing support for these relationships and the dimensionality of the construct supports this paper's goal of contributing to the validation of the proposed construct and measure by empirically verifying the conceptual relationships that would be predicted to exist among competence

dimensions and between competence dimensions and variables in the nomothetic network.

As can be seen, this chapter has provided results from the study that demonstrate the quality of the communication competence scales, answered the proposed research questions, disconfirmed the proposed hypotheses about distinctiveness, verified the extant measures of nomothetic variables, and contributed to validating the proposed model of communication competence. Specifically, the results illustrate that the proposed measure of competence is reliable in terms of Cronbach's alpha, and is composed of scales with good face validity, internal consistency (Spearman), and parallelism that combine to form a relatively unidimensional model of communication competence. In addition, it was shown that the overall construct of communication competence was also valid in terms of its relationship to a wide range of variables within the nomothetic network. The results also show that the extant measures are reliable and internally consistent according to the Spearman Test. With these results in mind, it is possible to discuss some of the conclusions that can be drawn from the data.

CHAPTER FOUR: DISCUSSION

In general, the preceding chapters have contributed to satisfying the three goals of this paper. The first goal was to synthesize, refine, and absorb the most useful constructs and skills of communication competence into a comprehensive multi-dimensional model and then to test the model. The second goal was to test the relationships between the construct of communication competence and variables in its nomothetic network. The third and final goal, which the present chapter addresses, is to show the relevance and utility of applying this construct to an organizational context.

Yet, before discussing the applications of the model or specific conclusions that can be drawn from the data, it is important to review the major findings illustrated in the previous chapter. The preceding results provide answers to the research questions and hypotheses. Communication competence was postulated to consist of nine skill dimensions and two motivational dimensions. The present research provides some support for this conceptualization but did not find that these dimensions were distinct or part of a multi-dimensional construct. As predicted, the dimensions of communication competence were found to be positively related to each other. In addition, communication competence generally related to variables in the nomothetic network in the predicted fashion. Based on these findings, the present chapter provides a discussion of conclusions that can be drawn from the data, applications of the model, limitations to the study, and implications for future research.

Conclusions

The results of this study suggest five basic conclusions and three potential applications for the model. The five conclusions are: (1) that the proposed

dimensions are descriptive of communication competence; (2) that the dimensions are not distinct but part of a unidimensional solution, (3) that a multidimensional solution is more useful although less parsimonious than a unidimensional solution, (4) that the results contribute to validating the construct, and (5) that the study helps map a repertoire of communication competence skills for the organizational context.

The first conclusion is that the proposed skills were considered by participants of this study to be "descriptive" of a competent communicator. That is, the participants view a competent communicator as one who cognitively interprets and develops communicative messages using the five proposed cognitive skills and behaviorally receives and sends information using the four proposed behavioral skills. The results for research questions one and two indicate the dimensions formed scales that had face validity, and were reliable, internally consistent (according to the Spearman Test), and parallel. In addition, the means for each of these dimensions were high (see Table 4) suggesting that employees at this organization perceived each of the nine skill dimensions and two motivational dimensions to be "descriptive" of communication competence at their company.

Although descriptive, the dimensions were not found to be distinct. This leads to the second conclusion - that the dimensions are not distinct but part of unidimensional model of communication competence. This is reflected by the high intercorrelations among factors (see Table 5), and the results for hypotheses one and two which showed evidence for a first- and second-order unidimensional solution (see Appendices H and I). These results are consistent with Wieman (1977) who tested a proposed 5-factor model and found a unidimensional solution.

The unidimensional results are also consistent with results from a previous study in a different organization where a variation of the proposed model was used. As mentioned in Chapter Two, the communication competence scale used here incorporated a previously used competence measure by Wright (1990) which contained five reliable (.87 or above alpha coefficient for all dimensions except appropriateness .61), internally consistent (5% or less deviations in Spearman and flatness tests), and parallel (3% deviations or less) dimensions. The five dimensions (appropriateness, interaction management, perspective taking, response repertoire, and language structure) combined to form an internally consistent second-order factor (Wright, 1990). Stiff et al. (1988) note that replication provides confidence that the structure of the data is not a product of sampling error. And although this was not an exact replication (since not all dimensions of the proposed model were replicated), these results do lend partial support to the stability of the unidimensional solution.

Although providing a partial replication, the unidimensional solution contains more measurement error than is desirable. For example, Appendix H.1 illustrates that a second-order unidimensional solution has 13% deviations in the Spearman test and 40% deviations in the flatness test. Although Appendix H.3 shows that by dropping the language structure and reading nonverbals dimensions it would be possible to get a more acceptable second-order factor (6% deviations in Spearman, 39% in flatness), this technique would reduce the conceptual utility of the model. For example, by dropping the language structure dimension, the model would no longer account for the skill necessary to create proper, organized messages. This implies that a competent organizational communicator need not be concerned with

the proper construction of messages, which is counterintuitive. It would seem unlikely that a person who provides disjointed, grammatically incorrect messages would be considered a competent communicator. It is argued here, that instead of removing dimensions to improve scale results, it would be more fruitful to refine the dimensions in future research. For example, a review of the data suggests that the items measuring language structure are not as precise as desired. A look at Appendix G.5 suggests that two of the items are quite weak in terms of their commonalities. A review of the conceptual content of the items reveals that the ability to "use complete sentences" or "construct logical, well supported arguments" may not be integral to one's language structure skills in a general sense. These items should be rewritten to reflect the fact that the model is concerned with verbal communication and not argumentation (e.g. constructing well supported arguments) or written communication (e.g. using complete sentences). Future research should include rewriting and refining weak items in the language structure and reading nonverbals dimensions to reduce the measurement error associated with the scale. This approach is preferable to the alternative approach of dropping conceptually useful dimensions since that lowers the conceptual utility of the model.

Although the above scales were found to be unidimensional and relatively clean, that was not one of the primary goals of this study. The primary goal was to find distinct dimensions using a self-report measure. The self-report measure failed to do this. This could suggest that a self-report measure may not have been the best measure for this model. It is possible that the self-report responses were inflated by a social desirability bias which suggests that respondents' ranked themselves high on all items in order to maintain their own self image. Thus, there

was no variance among dimensions. It is argued here that an alternative measure might be more useful in teasing out the predicted distinctiveness of the model. For example, an other-report might be used. In an organizational context, this may mean that coworkers or supervisors complete evaluations of the subject using a variation of the competence questionnaire. The variation would consist of a semantic change in the questionnaire (see Appendix C). Instead of the questionnaire headers reading "You Know..." and "You are Able...," the headers would read "The Subject Knows..." and "The Subject is Able..." Thus, the questionnaire would require the respondent (e.g. the subject's supervisor) to rate whether "The Subject is Able" to perform all of the behavioral skills and whether "The Subject Knows" and therefore possesses all of the cognitive skills. Although this approach may be useful in breaking out the dimensions, it too has its limitations. One limitation is that cognitive skills would have to be inferred from the respondents behavior and the other may not make accurate inferences. Another limitation is the potential for a halo effect. A halo-effect would suggest that the other is rating the subject higher simply because the other likes the subject or thinks that the subject is "virtuous" (Kerlinger, 1986). Although an other-report has limitations, it may be more effective in teasing out the proposed dimensions and providing support for the view that communication competence is a multi-dimensional construct. Attempting to support a multidimensional model even in the face of nonsupporting evidence is consistent with Wieman. Even though Weiman (1977) found a unidimensional solution for his proposed multidimensional model, he still claimed that "different components of communication competence can and should be differentiated" (p. 21). Possibly an alternative measure would accomplish this goal.

But why is it important to support a multidimensional model? Answering that question means addressing the third conclusion — that a multidimensional model is considered to be more useful than a unidimensional model, although less parsimonious. This conclusion, which is the product of arguments and findings presented throughout the paper, reflects a tradeoff among two primary goals of science: parsimony and utility. Most scholars would agree that a unidimensional solution is more parsimonious since it accounts for a number of communication skills using only one dimension. Thus, the interpretation of competence would be much simpler. You either are or are not competent according to the 62 items found on the retained scale (see Appendix E). In addition, the predictions of how competence relates to organizational variables would be simplified. Instead of determining how each dimension relates to organizational variables (e.g. productivity, satisfaction, etc.) the relationships could be described in terms of how the overall construct of competence relates to the variables. This eliminates a large number of predicted links and simplifies the prediction process. In addition, a unidimensional solution would be much simpler in terms of analysis since less empirical links among dimensions would not have to be tested. This suggests that a unidimensional solution is more parsimonious in interpretation, prediction, and analysis.

The above arguments imply that a multidimensional model is less parsimonious. A look at the number of nomothetic predictions required in Chapter One illustrates that this appears to be the case. There were exponentially more predictions for the proposed multidimensional model than would be necessary for a unidimensional model of communication competence which implies more complexity in interpretation and analysis. Therefore, it is acknowledged that a

multidimensional model requires more complex interpretation, prediction, and analysis.

Littlejohn (1983) would likely agree that a unidimensional model is simpler and thus provides "logical simplicity" or parsimony. And while Dubin (1978) agrees that parsimony simplifies relationships, he points out that parsimony is not always concerned with efficiency. Efficiency is considered here to account for the usefulness of the conceptualization, and a multidimensional model is considered to be more useful than a unidimensional model.

A multidimensional model is more useful to organizations and to organizational members. In terms of its use to the organization, consider the application of a multidimensional model for training purposes. A multidimensional model would allow for a precise diagnosis of employee communicative strengths and weaknesses, thus requiring training only on weaknesses. For example, if the results had supported a multidimensional model, Table 4 would suggest that employees at this organization need training on perspective taking and response repertoire skills. This target training of specific weaknesses would make training efforts more efficient and could reduce the number of "productive" hours lost to training — thus saving the company money. Alternatively, a unidimensional model would be less useful since it would only identify whether an individual did or did not need training, not the specific communicative weaknesses of the individual. Thus, training would have to consist of all skills and hence require more training time, training dollars, and person hours away from work. The above arguments suggest that a multidimensional model is more useful to an organization. But, what about its utility to the individual?

A multi-dimensional model could potentially be more useful to the individual organizational member as well. During formal training efforts a multidimensional measure could be used to help employees target their communicative strengths and weaknesses. Trainers and management could then encourage employees to focus on overcoming those weaknesses during informal daily interactions. This would be considered self-training and would occur whenever an individual concentrated on overcoming target weaknesses during interactions with other organizational members. Self-training outside the training room would facilitate the transference of formal communication skills training. To illustrate, consider the mean scores on Table 4 to be a hypothetical example of an individual's competence score. The mean scores suggest that the individual would want to develop his/her perspective taking or response repertoire skills. He/she could improve these skills by focusing on perspective taking or using alternative responses during a typical daily interaction with organizational members. The employee may even wish to get feedback from the other to determine if he/she had been successful in perspective taking or providing a diversity of responses during a given interaction. This type of self-training could make the individual more communicatively competent.

As mentioned above, the precise diagnosis and prescription that could be derived from a multidimensional model would not be possible with a unidimensional model. For the above reasons, a multidimensional model is considered to be more useful for organizations and organizational members than a unidimensional model. This is why future efforts should use alternative measures to attempt to support a multidimensional model.

Even though a multidimensional model was not supported, the results did contribute to this study's goal of validating the construct of communication competence. This, the fourth conclusion, is based on an examination of the relationships among the communication competence dimensions and between the competence construct and variables in its nomothetic network (see Tables 5 and 6).

As argued throughout the paper and predicted in hypothesis 3, the dimensions are all positively related. The dimensions of interest formed a second-order factor. Wieman (1977) also found that his five interpersonal dimensions were positively related. More important for the validation of the construct are the results for how the overall communication competence construct related to variables in the nomothetic network.

Table 6 illustrates that all of the relationships were in the predicted direction although some were not as strong as predicted. According to Stiff et al. (1990) if the data are consistent with the nomothetic network identified, then evidence is strong for the validity of the construct. The results provide such evidence and contribute to validating the proposed model and measure thereby supporting another of the previously mentioned goals.

Although the results were encouraging, not all predictions about the nomothetic network met the criteria of being statistically significant at the .05 level or less. The following discussion provides a conceptual explanation for the relationships that were not statistically significant.

As mentioned earlier, communication competence and role ambiguity were predicted to be negatively related. The correlation ($r = -.24$) was in the predicted direction but was not statistically significant. As argued in previous chapters, the

relationship between role ambiguity and communication competence could be moderated by the availability of role-relevant information. Perhaps at this particular company role-relevant information is not always accessible. If the information is unavailable, there is no way to reduce ambiguity about one's role regardless of the person's competence level.

Similarly, three of the communication satisfaction dimensions did not meet the criteria of being statistically significant although they too were in the predicted direction (see Table 6). As with the previous example, the weak relationships could be the result of moderating variables. The low correlations for the communication satisfaction communication effectiveness (CSCE) dimension ($r = .24$) and corporate information (CSCI) dimension ($r = .20$), could suggest that the employees' satisfaction may be moderated by the availability of information. Possibly at this company, information about policies and procedures is highly controlled and not readily available to employees. If the information is unavailable, the person is not likely to be satisfied with the effectiveness of communication (CSCE) or with corporate information (CSCI). This moderating variable would explain the lack or significant findings for these relationships.

The final relationship that did not meet the criteria of being statistically significant was the relationship between communication competence and the communication satisfaction supervisory communication dimension ($r = .21$). In Chapter One, this relationship was argued to be moderated by the supervisor's willingness and ability to listen and provide guidance. If supervisors at this company are unwilling and unable to listen and provide guidance, then the participant is not likely to be satisfied with their supervisory communication. Thus, the supervisor's

willingness and ability could moderate this relationship and might account for the low correlation between these variables.

Although not all of the above relationships were statistically significant, it is important to remember that they were all in the predicted direction. The remaining relationships all met the criteria of being statistically significant in the predicted direction or having the predicted null relationship. This provides evidence for the construct validity of the measure and implies that the measure really is tapping communication competence. This is important not only to scholars studying this construct but also to organizations because it suggests that this measure of communication competence can be applied to the organizational context.

A fifth and final conclusion is that this study helped contribute to scholarly efforts to map out the repertoire of skills that communicators use to communicate competently in an organizational setting. Daniels and Pearson (1986) claim that the repertoire of skills that an actor may use to "fit" a given person's idea of a competent communicator in an organization may be so large that it cannot ultimately be mapped. Although this study did not exhaust all of the potential skills that "fit" a given person's idea of a competent communicator, it did demonstrate that at least nine skills "fit" participants idea of what it takes to be communicatively competent at this organization. Additional studies may reveal more.

Although enlightening, the above conclusions do not address the applications of this model to an organization. To address this concern, the following section discusses how the model could be used in an organization.

Applications

Although the proposed model/measure may have a number of useful applications to organizations, it is argued here that the three most relevant applications are for: (1) training, (2) performance appraisals, and (3) employee selection. The following discussion illustrates these applications and contributes to this paper's goal of showing the relevance and utility of applying this construct to the organizational context. Although the following discussion emphasizes the utility of a unidimensional communication competence construct to organizations since a unidimensional solution was found, it is important to remember that a multidimensional model is considered even more useful, if future studies were able to confirm such a model. As mentioned throughout, one useful application of the model/measure is to assess communication competence levels for the purpose of facilitating improved communication training. Using this scale, organizations could assess employee levels of perceived competence by distributing the competence measure to all employees, both line and staff. The results would provide the organization with a needs assessment of **who** needs communication training. For example, the general results of this study (see Table 4) suggest that all participants at this company could use communication training. Yet, this needs assessment could be further broken down by job classification or department to target specific groups that may need training more than others. Specifically, these breakouts would tell an organization which groups need training and which don't. This would enable an organization to train only those departments, levels, or groups who needed it and not waste money and effort training those who are already communicatively competent.

In addition to telling the organization **who** needs training, the retained unidimensional measure would also tell the organization, and especially organizational trainers, **what** needs to be trained. If members ranked low on the unidimensional scale then trainers would have a list of skill items that could be used as a basis for developing a communication training program.

In the event that a multidimensional model was supported, the measure would also tell trainers **which** specific communication skill dimensions needed to be emphasized. Training programs could then be developed to help employees overcome the specific communicative weaknesses found in the assessment. For example, if a communicative needs assessment determined that articulation and expressiveness skills were poor in an organization, a training program could be designed to address those weaknesses. The training department could videotape interactions in a training situation and then replay those interactions for individual employees, pointing out examples of an individual employee's lack of clarity or expressiveness. Trainers could then give the employee opportunities to develop his/her articulation and expressiveness skills in a training situation. The trainer could videotape later training interactions to show the employee's improvement (or lack of improvement) in overcoming his/her weakness in articulating or expressing. Thus, the model/ measure could be applied to an organization to show **who** needs to be trained, **what** needs to be trained, and in the event of multidimensional solution **which** specific skills need to be trained.

Of course, a note of caution needs to made here in terms of the use of a self-report instrument. As already suggested, it is likely that social desirability bias will affect employee's responses since employee's may wish to look "competent" for

their superiors. This is a potential problem with the measure, not the model. The previously made suggestion to use an other-report may overcome this bias and facilitate the application of this model/measure as a diagnostics tool for communication training in organizations.

As mentioned, the benefit of using this model/measure as a diagnostics tool is that it may facilitate the improvement of employee's communication skills. This is important since corporate professionals spend 70% of their workday communicating and many of the organizational problems they face are the result of poor communication. According to Perotti (1987) 60% to 90% of management and organizational problems are attributed to communication dysfunction. This model/measure could help organizations overcome communication dysfunction through training.

Improved communication through training has additional benefits to the organization. For example, a study by Pritchard, Jones, Roth, Strubing, and Ekeberg (1988) found that effective group-level feedback increased productivity an average of 50% over baseline. Improved communication skills could facilitate improved feedback. In addition, a study by Johnson (1990) found that communication is central to innovative processes within organizations suggesting that competent communicators can contribute more to innovation than incompetent communicators. Grassell (1990) adds that for a company to remain profitable, managers must have good communication abilities. These findings suggest that applying the proposed model/measure to training efforts to improve employee communication skills is a useful application for organizations.

In addition to training, this model/measure could also be used in performance appraisals to assess, reward, and facilitate the development of communication competence. This is the second application to be discussed. Although performance appraisals may focus on a diversity of performance variables such as problem solving, project management, etc, many appraisals address employee's relational performance. An integral part of one's relational performance is the ability to competently communicate with the other; hence, the value of assessing an employee's communication performance is high. As a performance appraisal device, the aforementioned other-report would be most useful to supervisors. The supervisors could use the skills found in Appendix E as a checklist for evaluating employee's communicative performance. Those employees who scored high on such a checklist might receive additional compensation for contributing to organizational functioning as discussed above. Providing additional compensation for good communication performance would reward employee's communicative efforts. In fact, the promise of such a reward may be the outcome that motivates the employee to communicate competently throughout the year (see Chapter One — Motivational Component). Thus, the proposed model/measure could be used in performance appraisals as a basis for assessing and rewarding competent communicative performance.

In addition, the supervisor's appraisal of employee's communicative performance may also be used to facilitate the development of employees communicative competence. For example, supervisors may use the communication performance appraisal as a basis for determining which employees should be signed up for training. Those employees with low ratings would receive communication

training. In addition, annual assessments would provide comparative data for evaluating employees' communicative growth over extended periods and thus assist in the continual communicative development of employees. Continually appraising and developing employee communication skills is considered essential to successful organizational functioning. The above performance appraisal applications are consistent with Monge et al. (1982) who point out that competence assessment instruments are useful tools for performance appraisals.

There is also a third application of the model. It could be used to facilitate effective employee selection. The assumption here is that for an employee to be effective in any organization, he/she must have good communication skills. This assumption is consistent with manager's perceptions. Young (1989) found that managers of 11 firms consider communication skills to be one of the two most important skills for managers. Analoui (1990) in a study of 16 public service companies found that 75% of employees claim that interpersonnel communication skills are important to managers. Murphy (1988) adds that the ability to communicate competently is one of seven key characteristics that companies look for in hiring senior executives.

The above research suggests that the proposed communication competence model/measure would be useful in screening job candidates to determine which were communicatively competent and which were not. Potential job candidates could be required to complete the retained communication competence scale as part of the selection process to see if they had the necessary communication skills to be a good employee. This is consistent with a 1989 American Management Association

survey on basic skills testing which found that one-third of the sample organizations tested applicants (Sherman, 1989).

To illustrate how the model/measure might be used as a screening device, the following hypothetical example is presented. IYF Consulting Company is an international consulting firm that provides consulting services to Fortune 500 companies. The management is interested in hiring qualified consultants and has thus developed a job profile that describes the general skills necessary to be an effective consultant at this company. Communication skills are an integral part of that profile since they are necessary for effectively communicating with coworkers or clients. For this company, the proposed model/measure could be used to determine which job candidates had the necessary communication skills and to predict the candidate's potential for future success with the organization. The prediction of success is supported by Sypher, Bostrom, and Seibert (1989) who found that good communicators were more upwardly mobile.

Of course there are some limitations with using the retained self-report scale in the above example. One limitation is that the proposed model would have to be tested in a variety of settings to determine if the communication skills noted here are generalizable to the general workforce. The generalizability of the model/measure is discussed in more detail in a later section. Another limitation is that the previously mentioned social desirability bias may limit the use of a self-report measure for employee selection.

Yet, alternative methods based on the model described and tested here could also be used to screen potential job candidates. For example, the recruiter could have the candidate partake in a role-playing exercise as part of the selection process.

The role-play may be designed in such a way as to elicit most or all of the nine skills discussed here. Using the above example, potential candidates for a consulting position could be given a scenario which requires them to communicate with a client. The recruiter could play the role of the client. The job candidate would interact with the client (recruiter) and the recruiter could code the candidates responses according to the retained model/measure to determine if the candidate's performance was competent. Thus, recruiters could retain or eliminate candidates on the basis of their communicative performance in these role-taking scenarios. Eliminating poor candidates is consistent with Sherman (1989) who found that nine out ten companies surveyed refused to hire candidates who failed screening tests.

Although future work needs to be done to develop additional alternative measures, the above discussion shows the utility of applying the proposed model as an aid to employee selection. This application is supported by Perotti (1987) who claims that communication competence measures are of value to organizations as tools for employee selection. The above results suggest that the model/measure is also valuable for facilitating improved communication training and for performance appraisals.

Limitations

As can be seen, the results provide some interesting and thought-provoking conclusions and applications, but these are not without limitation. Four limitations in particular warrant consideration: (1) the use of a single sample, (2) the use of a relatively small sample size, (3) the use of a self-report measure, and (4) the focus on content instead of process.

The first limitation is that only one sample was used for the study. Although the sample was basically representative of the salaried employees at this company as suggested by the demographic data, it would be difficult to argue that the sample is representative of other automotive manufacturers and even more difficult to argue that the sample is representative of the overall workforce. For this reason, it is important to apply the communication competence measure to a variety of contexts to ensure the generalizability of the measure and to illustrate that the construct is not context specific. Thus, it would be useful to conduct this study across a variety of industries that are functionally different from the automotive industry. It would also be useful to study a variety of organizational levels including top management and non-salaried employees. For example, the model could be tested at various levels within service industries, high-tech industries, and manufacturing industries. It is possible that different levels or different industries emphasize different communication skills. Thus, future studies replicating this model should focus on other industries and non-salaried personnel as well as salaried personnel at higher levels to get a more complete picture of the communication skills employees use in different settings. This would contribute to the generalizability of the findings and to the external validity of the model. It would also help determine if the proposed model can be used to measure communication competence in the general workforce.

A second limitation related to sampling is the small sample size used which is associated with a greater amount of sampling error. This produces less stable estimates of reliability coefficients and factor loadings. As a result, the estimates could be higher or lower than would be expected with a larger sample. Yet

assuming that this error is random, the results should not be skewed in any specific direction, and thus the findings should not be systematically affected.

Another problem with sampling error is that it lowers the precision of the tests used to confirm scales. Although this may lower one's confidence in the tests conducted here, the fact that these tests were specified a priori and were theoretically grounded helps minimize the problem. To reduce the above limitations associated with sampling error, Kerlinger (1986) would suggest using a larger sample to "wash out error variance" (p.593). This would reduce sampling error and improve generalizability.

A third limitation of this study is that it relied exclusively on self-report data. One reasons for using self-report is that it is the "only means researchers have for gathering information about self-perceptions of communication behavior" (Cegala, 1986, p. 10). Spitzberg and Cupach (1984) add that it also provides a rich source of psychological data which means that it should be especially useful for assessing cognitive skills. Unfortunately, one type of bias that could occur is that respondents try to protect their self concept and thus rate themselves highly (Rubin, 1986). As already mentioned, this bias could account for the lack of distinctiveness among dimensions, and limit its application as a training or employee selection device.

A final limitation is that the study only focused on the content of the model and not on the process. As mentioned in Chapter One there is a distinct process that was argued to account for how a person communicates competently. Although this study provided valuable insight to the content of the construct, future work needs to address whether the proposed process accurately accounts for competent

communication. The next section suggests some ways to address this limitation and those mentioned above.

Implications for Future Research

The results, conclusions, applications, and limitations discussed above suggest five implications for future research. Specifically, future construct validation efforts should: (1) use alternative measures, (2) study other organizations, (3) address the process aspects of the model, (4) determine how communication competence is developed, and (5) confirm the consequences of communicating competently.

First, future studies should develop and test alternative measures of communication competence to reduce the inaccuracies often associated with self-reports (e.g. social desirability responses). These studies should use a variety of techniques to facilitate the application of this model to organizations and also to clarify the dimensionality of the construct. Future studies could use observational methods (Cegala, 1986), conversational recall methods (Rubin, 1986), or role playing scenarios accompanied by observation (Rose, Caynor, & Edleson, 1977) to ascertain competence levels. Semantic and behavioral coding schemes could be developed for these methods to reflect the dimensions of the model. For example, an observational technique could be used where a researcher observed interactions or role playing scenarios and then content analyzed participants' messages and actions into categories that reflected the proposed dimensional scheme. Repeated research in this area could focus on developing a valid semantic and behavioral coding scheme representing the nine proposed dimensions. Of course one of the limitations is that cognitive skills would have to inferred from behavioral manifestations and some of the cognitive skills such as appropriateness may be

difficult to assess if the researcher was not familiar with the context. Yet, if these measures could be developed they would not only be empirically useful in clarifying the dimensionality of the construct, but they would also be practically useful in training workshops to help employees understand and apply the various dimensions (e.g. via observation of role-playing scenarios). They could also be applied to employee selection by training the recruiter to use the semantic/behavioral coding scheme to assess candidates' communicative competence.

Another alternative measure is the aforementioned other-report. Researchers could use other-reports for competency evaluations, such as Monge et al. (1982) did by having the supervisor complete competency evaluations for their subordinates. This would make the measure more of a behavioral measure than a self-report and would be very useful for supervisors during employee performance appraisals. As mentioned before, this technique does have some limitations such as the potential for a halo-effect which could influence the results, and the problem of assessing the subject's cognitive skills since those skills must be inferred by the other.

Although the above alternative measures have limitations, they still would be useful to academicians in their construct validation efforts. Various authors (Kerlinger, 1986; Duran, 1983; Perotti, 1987) note that using a combination of instruments would enhance the possibility of attaining convergent validity, which would further contribute to validating the proposed conceptualization. Thus, future research efforts either in the field or laboratory may wish to use multiple methods to overcome limitations with the current study.

A second implication is that future work should continue attempts to validate this construct by studying the proposed model in a variety of other settings and

samples such as those mentioned earlier. It would be interesting to see if line members of a service industry describe competence using the same skills dimensions as do top executives in a manufacturing industry. Finding similar results across samples and across industries would be most beneficial. Kerlinger (1986) points out that if factors repeatedly emerge with different tests, different samples, and different conditions, then there is evidence that there is an underlying variable that is being successfully measured.

A third implication is that it is not only important to validate the content of the construct but also important to verify the process of communication competence as outlined here. Understanding the process would help scholars to explain why some communicators demonstrate their competence and why some don't. This should also vary within subjects from situation to situation. Future studies should determine whether communication skill demonstration really is affected by motivational outcomes and perceived probabilities that effort will lead to performance. Do people actually expend communicative effort because they believe it will lead to good communicative performance? Do people communicate because they are motivated by rewards? These are just some of the questions that should be addressed by future process studies.

In addition, future efforts should look at the proposed process feedback loops. It was argued in Chapter One that incoming information leads to motivation which leads to skill usage which supplies new information to the motivational component which then drives skill usage, etc. A rough outline of how a process study might work in an organization would be the following. In conjunction with the researcher, the company would provide information about intrinsic and extrinsic outcomes

available to employees. If employees then communicated competently, the first part of the process would be supported. The company would then have to provide information about additional intrinsic and extrinsic outcomes that were available. If the researcher found that the employees continued to communicate competently to attain those outcomes the second part of the process would be supported. Obviously a process study would have to be much more sophisticated than the above outline. Yet, such a study would contribute to a greater understanding of process and provide more information on how to motivate employees to communicate competently.

A fourth implication is that it is important to address the developmental aspects of how people become competent in the organizational context. Knowing how to develop these skills would contribute greatly to a person's efforts to become competent in the organizational context and would also facilitate training efforts. Future studies in this developmental area could lend credence to Phillips (1983) notion that competence research can facilitate improved performance.

In addition to determining the antecedent of communication competence, a fifth and final implication is that it is important to confirm the consequences of communicating competently beyond those implied from the nomothetic network identified here. Knowing the consequences of communication competence would contribute to a person's awareness of what to expect when they behave competently. For example, work done by Sypher (1984) claims that communicating competently contributes to an individual's success in an organization. Sypher (1984) cites findings that show that communication-related factors are important in differentiating poor, average, and superior managers. Rubin (1985) adds that

evaluations of student teachers' communication competence levels have been shown to predict (with 88% accuracy) how others will rate the student teachers communication performance. The notion that competence ratings relate to performance evaluations needs to be more fully developed, as do the relationships between competence and other consequences. Research in this area would greatly help people to understand what is likely to happen if they communicate competently.

Although the preceding discussion illustrates that more work needs to be done in a number of areas, this study has shown that the proposed nine skills are descriptive of communication competence and that those nine skills combine to form a unidimensional model of communication competence. Moreover, it has been demonstrated that these dimensions are all positively related to one another and that the construct relates to variables in the nomothetic network in the predicted manner.

The goals of this work have been to synthesize and refine previous work into a more useful conceptualization of communication competence and to show the relevance of applying this construct to organizations. As mentioned, this model/measure could help in training employees to be more competent, appraising employees more effectively, and selecting the best employees for positions. This could contribute to an organization's effectiveness since competent communication is considered essential to organizational functioning. As Comfort (1972) points out, good skill is essential to good performance and the attainment of satisfying results.

Bibliography

Bibliography

Alderfer, C. P. (1969). An empirical test of a new theory of human needs, Organizational Behavior and Human Performance, 4, 142-175.

Alderfer, C.P. (1972). Existence, relatedness and growth human needs in organizational settings. New York: The Free Press. London: Collier-Macmillan Limited.

Aldag, R. J., Brief, A. P. & Schuler, R. S. (1977). Role conflict and ambiguity: a scale analysis. Organizational Behavior and Human Performance, 20, 111-128.

Allen, R.R., Brown, K.L. (1974). Functional communication competencies derived from the literature review. In R.R. Allen, K.L. Brown (Eds.), Developing communication competence in children. (pp. 35-277.) Illinois: National Textbook Company.

Analoui, F. (1990). Effective management with people skills. Journal of Managerial Psychology, 5, (3), 1-3.

Beinvenu, M. J., & Stewart, D. J., (1976). Dimensions of interpersonal communication. Journal of Psychology, 93, 105-111.

Berger, C.R., & Calabrese, R.J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. Human Communication Research, 3, 29-46.

Biwot, P. K. (1985). Competencies used most frequently by adult educators and the job activities considered important in their work. Ph.D. dissertation, Michigan State University, 1985.

Bochner, A. P., & Kelly, C. W., (1974). Interpersonal competence: rationale, philosophy, and implementation of a conceptual framework. The Speech Teacher, 23, (4), 281-301.

Brandt, D. R., (1978). On linking social performance with social competence: some relations between communicative style and attributions of interpersonal attractiveness and effectiveness. Human Communication Research, 5, (3), 223-237.

Brunner, C. C., & Spitzberg, B. H., (1986, April). Measuring interpersonal communication competence across situations: toward a theoretical integration of context and competence inference research. Paper presented at the annual meeting of the Central States Speech Association, Cincinnati, OH.

Buchanan, B. (1974). Building organizational commmitment: the socialization of managers in work organizations. Administrative Science Quarterly, 19, 533-546.

Campbell, J. P., & Pritchard, R. S., (1981). Motivation theory in industrial and organizational psychology. In Phillip Emmert and William C. Donaghy (Eds.). Human communication elements and contexts, (pp. 63-129). Reading: Addison Wesley Publishing Co.

Carey, A., & Varney, G. H., (1983). Which skills spell success in O.D.? Training and Development Journal, 38-40.

Cegala, D. J., (1986, April). Alternatives for operationalizing competence. Paper presented at the Central States Speech Association Convention, Cincinnati, OH.

Cegala, D. J., (1981). Interaction involvement: A cognitive dimension of communication competence. Communication Education, 30, 109-121.

Chin, J. J., & Ringer, J. R., (1986). What do measures of communication competence measure: factor analytic study of three competence instruments. Paper presented at the Central States Speech Association, Cincinnati, OH.

Clampitt, P. G., & Girard, D. M. (1987). Time for reflection: A factor analytic study of the communication satisfaction instrument. Paper presented at the annual convention of the International Communication Association, Montreal.

Clampitt, P. G. & Girard, D. M. (1986). Communication satisfaction: A useful construct? Paper presented at the annual convention of the International Communication Association, Chicago.

Comfort, A. (1972). The joy of sex: A cordon bleu guide to lovemaking. New York, NY: Crown Publishers, Inc.

Connolly, T. (1976). Some conceptual and methodological issues an expectancy models of work performance motivation, The Academy of Management Review, 1, (4), 37-47.

Cook, J. D., Hepworth S. J., Wall, T. D., & Warr, P. B. (1981). The experience of work: A compendium and review of 249 measures and their use. Academic Press. London.

Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. Psychological Bulletin, 52, 281-302.

Cupach, W. R., & Spitzberg, B. H., (1983). Trait versus state: A comparison of dispositional and situational measures of interpersonal communication competence. The Western Journal of Speech Communication, 47, 347-379.

Daniels, T. D., & Pearson, J. C., (1986, April). An Analysis and critique of values and assumptions informing competency research and prescriptions. Paper presented at the annual meeting of the Central States Speech Association, Cincinnati, OH.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. Journal of Personality and Social Psychology, 44, 113-126.

Deci, E. (1976). The hidden costs of rewards. Organizational Dynamics, 61-72.

Downs, C. W., & Hazen, M. D. (1977). A factor analytic study of communication satisfaction. The Journal of Business Communication, 14(3), 63-73.

Duran, R. L., & Kelly, L. (1989, May). An investigation into the cognitive domain of competence II: The relationships among communicative competency, interaction, involvement, and cognitive complexity. Paper presented at the meeting of the Speech Communication Association, San Francisco, CA.

Duran, R. L. (1983). Communicative adaptability: Measure of social communication competence. Communication Quarterly, 31, (4), 320-327.

Dustin, D., & Ehly, S. (1984). Skill for effective consultation. The School Counselor, 23-29.

Emmert, P. I., & Donaghy, W. C., (1981). Motivation. In P. Emmert & W. C. Donaghy (Eds.), Human communication elements and contexts (pp. 53-73). Mass.: Addison Wesley Publishing Co..

Farace, R. V., Taylor, J. A., & Stewart, J. P. Criteria for evaluation of organizational communication effectiveness: Review and synthesis. In B. D. Ruben (Ed.). Communication Yearbook 2. New Brunswick, N.J.: Transaction, 1978.

Farber, B. (1961). Elements of competence in interpersonal relations: a factor analysis. Sociometry, 25, 30-47.

Grassell, M. (1990). Supervisory leadership skills for supervisors. Supervision, 51, (1), 3-4.

Greene, J. O. (1984). A cognitive approach to human communication: An action assembly theory. Communication Monographs, 51, 289-306.

Hackman, J. & Porter, L. (1968). Expectancy theory predictions of work effectiveness, Organizational Behavior and Human Performance, 3, 417-426.

Hamner, W. C., & Tosi, H. L. (1974). Relationship of role conflict and role ambiguity to job involvement measures. Journal of Applied Psychology, 59, (a4), 497-499.

Hecht, M. L. (1978). Measure of communication satisfaction. Human Communication Research, 4, (4), 350-368.

Holland, J. I., & Baird, I., (1968). An interpersonal competency scale. Educational and Psychological Measurement, 28, 503-510.

Hunter, J.E., & Lim, T. S. (1987). LIMSTAT. Unpublished manuscript, Department of Communication, Michigan State University, E. Lansing, MI.

Hyams, J. (1979). Zen in the martial arts. Bantam Books. New York, New York.

Hymes, D. (1974). Competence and performance in linguistic theory. Language acquisition: models and methods. pp. 3-28. Academic Press. London.

Johnson, D. J. (1990). Effects of communicative factors on participation in innovations. Journal of Business Communication, 27, (1), 7-23.

Jones, T. S., & Brunner, C. C., & Remland, M. S. (1986). Perceptions of style and competence in communication. Perceptual and Motor Skills, 63, 1224-1226.

Kerlinger, F. N. (1986). Foundations of behavioral research. (3rd ed.). New York: Holt, Rinehart and Winston.

Lanyon, R. I., (1967). Measurement of social competence in college males. Journal of Consulting Psychology, 31. (5), 495-498.

Larson, C. (1978). Problems in assessing functional communication. Communication Education, 27, 304-309.

Lawler III. E. E., & Suttle, J.L. (1973). Expectancy theory and job behavior. Organizational Behavior and Human Performance, 9, 482-503.

Lawler, E. (1968). A correlational - causal analysis of the relationship between expectancy attitudes and job performance, The Journal of Applied Psychology, 52, 462-468.

Levine, T. R., & McCroskey, J. C. (1990). Measuring trait communication apprehension: A test of rival measurement models of the PRCA-24. Communication Monographs, 57, 62-72.

Locke, E. A., Feren, D. B., McCaleb, V. M., Shaw, K. N. & Denny, A. T., (19xx). Changes in working life. New York: John Wiley and Sons, pp. 363-388.

Lodahl, T. M., & Kejner, M. (1965). The definition and measurement of job involvement. Journal of Applied Psychology, 49, (1), 24-33.

Macklin, T. J., & Rossiter, C. M. (1976). Interpersonal communications and self-actualization. Communication Quarterly, 24, (4), 45-50.

McCroskey, J. C. (1982). Communication competence and performance: a research and pedagogical perspective. Communication Education, 31, 3-7.

McCroskey, J. C. (1982b). Oral Communication Apprehension: a reconceptualization. In M. Burgoon (ed.). Communication Yearbook 6. Beverly Hills, CA: Sage.

McCroskey, J.C. (1984). Communication competence: the elusive construct. In Bostrom, R. N. (Eds.), Competence in communication (pp. 259-269). Beverly Hills: Sage Publications.

McCroskey, J. C. & McCroskey, L. I. (1986, April). Self-report as an approach to measuring communication competence. Paper presented at the annual convention of the Central States Speech Association, Cincinnati, OH.

Meichenbaum D., Butler, L., & Gruson, L. (1981). Toward a conceptual model of social competence. In J. D. Wine & M. D. Smye (Eds.). Social competence (pp. 36-60). New York: Guilford Press.

Miller, G.R., & Steinberg, M. (1975). Between people: A new analysis of interpersonal communication. Chicago: Science Research Associates.

Miller, K. I., & Stiff, J. B., & Ellis, B. H. (1988). Communication and empathy as precursors to burnout among human service workers. Communication Monographs, 55, 250-265.

Miner, J.B. (1980). Need Hierarchy Theory. Miner J. B. (Eds.), Theories of organizatioal behavior. (Chapter 2). Illinois: The Dryden Press.

Mitchell, T.R. (1974). Expectancy Models of Job Satisfaction, Occupational Preference and Effort: A Theoretical, Methodological and Empirical Appraisal. Psychological Bulletin, 81, (12), 1053-1077.

Models for Excellence. American Society for Training and Development, Unpublished manuscript, 1983.

Monge, P. R., Bachman, S. G., Dillard, J. P., & Eisenberg, E. M. (1982). Communicator competence in the workplace: model testing and scale development. In M. Burgoon (ed.), Communication Yearbook 5 (pp. 505-528). New Brunswick, NJ: Transaction.

Murphy, S. E. (1988). Organizational competence - it depends on your staff. Training and Development, 42, (1), 34-36.

Norusis, M. J. (1990). SPSS/PC+Statistics 4.0. Chicago, IL: SPSS, B125-B152.

Parks, M.R. (1985). Interpersonal communication and the quest for personal competence. In M. L. Knapp & G. R. Miller (eds.) Handbook of Interpersonal Communication. Beverly Hills, CA: Sage, 171-201.

Pavitt, C., & Haight, L. (1985). The "competent communicator" as a cognitive prototype. Human Communication Research, 12, 225-241.

Pavitt, C., & Haight, L. (1986). Implict theories of communicative competence: situational and competence level differences in judgments of prototype and target. Communication Monographs, 53, (3), (pt. 2).

Pavitt, C., & Haight, L. (1986). Implicit theories of communicative competence: The semantics of social behavior. Western States Speech Journal, 3, (4), 204-219.

Pavitt, C. (1989). Accounting for the process of communicative competence evaluation. Communication Research, 16, 405-430.

Perotti, V.S. (1987). Identification of the competent organizational communication: triangulation of research methods in multiple field studies. For Inclusion in the Program of Scholarly Papers at the International Communication Association Meeting, Montreal.

Phillips, G. M. (1983). A competent view of competence. Communication Education, 32, 25-36.

Powers, W. & Lowry, D. (1984). Competence in communication. Beverly Hills, CA: Sage Publications, 57-71.

Pritchard, R.D., Jones, S.D., Roth, P.L. (1988). Effects of group feedback, goal setting, and incentives on organizational productivity. Journal of Applied Psychology, 73, (2), 337-358.

Redmund, M. V., (1985). The relationship between perceived communication competence and perceived empathy. Communication Monographs, 52, (4), (pt. 7).

Richmond, V. P., & McCroskey, J. C. (1985). Communication Apprehension, Avoidance, and Effectiveness. Gorsuch Scarisbrick, Publishers, 31-69.

Rose, S. D., Cayner, J. J., & Edleson, J. L. (1977). Measuring interpersonal competence. Social Work, 125-129.

Rossman, M. H., & Bunning, R. L. (1978). Knowledge and skills for the adult educator: a Delphi study. Adult Education, 28, (3), 139-155.

Rubin, R. (1982). Assessing speaking and listening competence at the college level: the communication competency assessment instrument, Communication Education, 31, 19-32.

Rubin, R. B., & Henzl, S. A., (1985). Cognitive complexity, communication competence, and verbal ability. Communication Quarterly, 32, (4), (pt. 4).

Rubin R. B., (1985). The validity of the communication competency assessment instrument. Communication Monographs, 52, 173-183.

Rubin R. B., (1986). Communication competence instrumentation and implications: A response. Paper presented at the annual convention of the Central States Speech Association, Cincinnati, OH.

Schrader, D. (1989). Toward a conceptual refinement of interpersonal communication competence: an analysis of subjects' conceptions of adept and inept communicators. Paper presented to the International Communication Association, San Francisco, CA, May 1989.

Schuler, R. S. (1977). The effects of role perceptions on employee satisfaction and performance moderated by employee ability. Organizational Behavior and Human Performance, 18, 98-107.

Schuler, R.S., Aldag, R.J., & Brief, A.P. (1977). Role conflict and ambiguity: A scale analysis. Organizational Behavior and Human Performance, 20, 111-128.

Sherman, E. (1989). Back to basics to improve skills. Personnel, 66, (7), 22-26.

Spitzberg, B. H. (1986). Issues in the study of communication competence. Progress in Communication Sciences, 8, 1-46.

Spitzberg, B. H. (1983). Communication competence as knowledge, skill, and impression. Communication Education, 32, 323-329.

Spitzberg, B. H., & Cupach, W. R. (1984). Interpersonal communication competence. Sage Publications, Beverly Hills, CA.

Spitzberg, B. H., & Hecht, M. L., (1984). Component model of relational competence. Human Communication Research, 10, (4), 575-599.

Stephan, T. D., & Harrison, T. M. (1986). Assessing communication style: a new measure. The American Journal of Family Therapy, 14, (3), 213-231.

Stiff, J.B., Miller, K.I., Dillard, J.P., & Somera, L. (1990). Testing the validity of the communicative responsiveness measure. Unpublished Manuscript, Arizona State University, Department of Communication, Tempe, AZ.

Stiff, J. B., Dillard, J. P., Somera, L., Kim, H., & Sleight, C. (1988). Empathy, communication, and prosocial behavior. Communication Monographs, 55, 198-213.

Stohl, C. (1983). Developing a communicative competence scale. In R. N. Bostrom (Ed.), Communication Yearbook 7 (pp. 685-716). Beverly Hills: Sage.

Stucker, L. (1982). Interpersonal competence instrumentation and development and preliminary findings. Applied Psychological Measurement, 6, (1), 69-81.

Sypher, B. D. (1984). The importance of social cognitive abilities in organizations. In R. N. Bostrom (Ed.), Competence in Communication (pp. 103-127), Beverly Hills: Sage Publications.

Sypher, B.D., Bostrom, R.N., Seibert, J.H. (1989). Listening, communication abilities, and success at work. Journal of Business Communication, 26, (4), 293-303.

Tardy, C. H. (1988). A handbook for the study of human communication: methods and instruments for observing, measuring, and assessing communication processes. In Communication competence. Norword, New Jersey: Ablex Publishing Co.

Tracy, L., & Johnson, T. W., (1981). What do the role conflict and role ambiguity scales measure? Journal of Applied Psychology, 66, (4), 464-469.

Vroom, V. H. (1966). Organizational Choice: A Study of Pre- and Post-decision Processes, Organizational Behavior and Human Performance, 1, 212-225.

White, R.W. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, (5), 297-333.

Wiemann, J. M. (1977). Explication and test of a model of communicative competence. Human Communication Research, 3, 195-213.

Wiemann, J. M., & Backlund, P. (1980). Current theory and research in communicative competence. Review of Educational Research, 50, (1), 185-199.

Williams, R. D. (1979). Criteria for competence. Psychological Reports, 44, 167-187.

Young, B. A. (1989). Management skills and knowledge: a case example from the construction industry. Leadership and Organization Development, 10, (6), 3-9.

Appendix A

Research Hypotheses and Questions

Appendix A: Research Hypotheses and Questions

R1: Which of the proposed cognitive and behavioral communication skills do employees use to describe their communication competence?

H1: There are nine distinct skill dimensions of communication competence.

R2: Which of the proposed motivational outcome dimensions do employees consider to motivate them to communicate competently?

H2: There are two distinct motivational outcome dimensions of communication competence.

H3: The proposed 11 dimensions of communication competence are all positively related to each other.

H4: The proposed 11 dimensions of communication competence will relate to the nomothetic network in the predicted manner.

Appendix B

Interview Questions

Appendix B: Interview Questions

Purpose of Interview

To develop a comprehensive list of skills that are necessary to be an effective communicator at your company.

Visualize an ideal communicator at your company. One who has all the right skills and qualities which he/she uses to be as effective as possible.

Unprimed Questions

1) How would you describe, in generel, this ideal communicator at your company?
2) What kinds of mental skills, in general, would the ideal communicator have?
3) What kinds of behavioral skills in general would the ideal communicator have at your company?
4) What does communication competence mean to you?
5) What specific communication skills would an ideal communicator have?
6) When an ideal communicator thinks about sending or receiving messages, what types of mental activities or skills are being used?

Primed Questions

7) What types of message sending skills would an ideal communicator have at your company?
8) What types of message receiving skills would an ideal communicator have?
9) One characteristic of an ideal communicator may be that they act or respond appropriately, what skills are necessary to act or respond appropriately in any situation?
10) Another characteristic of an ideal communicator may be that they are able to manage any interaction, what skills are necessary to manage interactions?
11) Another characteristic of an ideal communicator may be that they are able to take the perspective of others, what skills are necessary for perspective-taking?
12) How would you describe the response repertoire of an ideal communicator at your company?
13) What types of language skills would an ideal communicator have?
14) What types of skills are necessary to read nonverbals?
15) What types of nonverbal skills are necessary to send messages?

Appendix B: Interview Questions

16) What types of speaking skills are characteristic of an ideal communicator at your company.
17) What types of needs or goals motivate an ideal communicator at your company?
18) What drives or motivates an employee to communicate competently?

Appendix C

Cover Letter and Questionnaire

Appendix C: Cover Letter and Questionnaire

September 11, 1990

To: All Product Engineering, Materials, and Plant Five Personnel

From: Large L Product Team

Subject: Communication Questionnaire

Communication is an important part of putting out a quality product. That is why it is essential that you take a few moments now, complete the attached questionnaire, and return it in the pre-addressed envelope. Your responses are completely confidential and will provide senior management with valuable information about communication at your company.

We at the Large L Product Team wish to thank you for participating in this project and also for your quick response.

Sincerely,

Bob Jenkins
Personnel Manager

Appendix C: Cover Letter and Questionnaire

STATEMENT OF CONFIDENTIALITY AND CONSENT AGREEMENT

The purpose of this survey is to study communication skills at your company. It will take about 15-20 minutes to fill out. Participation is voluntary. You may choose not to participate at all, may refuse to participate in certain portions, may refuse to answer certain questions, or may discontinue at any time. All results will be treated with strict confidence and you will remain anonymous in any report of research findings. If you wish, you may detach the management cover letter that contains your name before returning. Given this statement of confidentiality and consent agreement, you indicate your voluntary agreement to participate by completing and returning this questionnaire in the attached pre-addressed envelope. If you have any questions or concerns, feel free to contact Alan Wright at Michigan State University, 336-1124.

INSTRUCTIONS

PART ONE of this questionnaire asks you to determine which communication skills best describe YOUR abilities. Please read each question below and determine how well each skill describes YOUR abilities. Circle the number that best reflects your response. For example, if you think the skill is "Very Descriptive" of YOUR abilities, then you'll want to circle the number 7. However, if you think the skill is "Not At All Descriptive" of YOUR abilities, then you'll want to circle the number 1. The response scale is on the top of each page.

PART TWO of this questionnaire asks you to describe what motivates YOU to communicate competently. After reading each item, circle the number that best reflects your response. For example, if you think the item is "Very Descriptive" of what motivates YOU to communicate competently, then you'll want to circle the number 7. However, if you think the item is "Not At All Descriptive" of what motivates YOU to communicate competently, then you'll want to circle the number 1. The response scale is on the top of each page.

THE REMAINING PARTS of this questionnaire ask you a series of questions. Please respond according to the scales provided at the top of each part. The final part asks you a few important demographic questions. Please be sure to check your desired response.

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE			SOMEWHAT DESCRIPTIVE			VERY DESCRIPTIVE
1	2	3	4	5	6	7

PART ONE: YOU KNOW ...

1)	How to say or do the right thing at the right time.	1	2	3	4	5	6	7
2)	How to explain something using a variety of different communication techniques.	1	2	3	4	5	6	7
3)	How to construct logical, well supported arguments.	1	2	3	4	5	6	7
4)	How to deliver brief, concise, complete messages.	1	2	3	4	5	6	7
5)	How to take the view of others who are directly working on a particular project.	1	2	3	4	5	6	7
6)	How to use smooth transitions from one topic to another during interactions.	1	2	3	4	5	6	7
7)	How to deliver a message without excessive use of jargon or acronyms.	1	2	3	4	5	6	7
8)	How to use a large number of response alternatives.	1	2	3	4	5	6	7
9)	How to move from your own view to the other's view.	1	2	3	4	5	6	7
10)	How to determine the appropriate time to deliver messages.	1	2	3	4	5	6	7
11)	How to use a large variety of communication techniques to deliver messages.	1	2	3	4	5	6	7
12)	How to convey appropriate deadlines or timeframes.	1	2	3	4	5	6	7
13)	How to get others to contribute their expertise and knowledge to the interaction.	1	2	3	4	5	6	7
14)	How to put yourself in an other's shoes to determine which message would best fit his/her perspective.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

15)	How to sense an other's mood and respond appropriately.	1	2	3	4	5	6	7
16)	How to present ideas in a logical order.	1	2	3	4	5	6	7
17)	How to bring up ideas from an other's point of view.	1	2	3	4	5	6	7
18)	How to use humor to facilitate smooth interactions.	1	2	3	4	5	6	7
19)	How to be direct and to the point.	1	2	3	4	5	6	7
20)	How to take the role of the other and predict the response he/she might have as a result of a message.	1	2	3	4	5	6	7
21)	How to get others involved in conversations.	1	2	3	4	5	6	7
22)	How to use body language that is appropriate to the message and other.	1	2	3	4	5	6	7
23)	How to ask an other for his/her perspective.	1	2	3	4	5	6	7
25)	How to determine the appropriate things to ask.	1	2	3	4	5	6	7
26)	How to use questions or comments to orient the discussion toward the desired goal.	1	2	3	4	5	6	7
27)	How to come back with a variety of responses.	1	2	3	4	5	6	7
28)	How to not interrupt and let other have his/her say.	1	2	3	4	5	6	7
29)	How to create messages using proper grammar.	1	2	3	4	5	6	7
30)	How to identify group or departmental norms to determine appropriate responses.	1	2	3	4	5	6	7
31)	How to manage conflict in interactions.	1	2	3	4	5	6	7
32)	How to construct well-organized messages.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

	NOT AT ALL DESCRIPTIVE 1 2		SOMEWHAT DESCRIPTIVE 3 4 5			VERY DESCRIPTIVE 6 7	
33)	How to deliver a message according to the other's educational level.	1	2	3	4	5	6	7
34)	How to field questions that arise from your message.	1	2	3	4	5	6	7
35)	How to determine the problems, constraints, and requirements of an other's position.	1	2	3	4	5	6	7
36)	How to communicate using complete sentences.	1	2	3	4	5	6	7
37)	How to follow an agenda during an interaction.	1	2	3	4	5	6	7
38)	How to respond quickly or "be quick on your feet."	1	2	3	4	5	6	7
39)	How to use a diversity of words or phrases.	1	2	3	4	5	6	7
40)	How to repeat back or paraphrase an other's comments to ensure understanding.	1	2	3	4	5	6	7
41)	How to deliver a message according to the other's knowledge of the project or job.	1	2	3	4	5	6	7
42)	How to disagree without offending or alienating.	1	2	3	4	5	6	7
43)	How to determine the other's interests and needs.	1	2	3	4	5	6	7
44)	How to use the terminology or jargon of the other.	1	2	3	4	5	6	7
45)	How to redirect discussions back to the original topic or purpose.	1	2	3	4	5	6	7
46)	How to gather information about an other so you can determine his/her perspective.	1	2	3	4	5	6	7
47)	How to provide the appropriate amount of detail in messages.	1	2	3	4	5	6	7
48)	How to state a purpose or agenda for an interaction.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

	NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

50)	How to deliver the same message in a variety of ways.	1	2	3	4	5	6	7
51)	How to nonverbally acknowledge or encourage responses (e.g. nodding, raising eyebrows, etc.).	1	2	3	4	5	6	7
52)	How to tap into a reservoir of words and phrases when creating messages.	1	2	3	4	5	6	7
53)	How to integrate other's comments into conversations or presentations.	1	2	3	4	5	6	7
54)	How to communicate complex ideas in a simple way.	1	2	3	4	5	6	7
55)	How to ask others for ideas or feedback.	1	2	3	4	5	6	7
56)	How to deliver a message according to the other's job status level.	1	2	3	4	5	6	7
57)	How to present ideas in a systematic, organized way.	1	2	3	4	5	6	7
58)	How to speak without being antagonistic or abusive.	1	2	3	4	5	6	7

PART ONE: YOU ARE ...

1)	Able to speak in an understandable manner.	1	2	3	4	5	6	7
2)	Able to emphasize messages by shifting your vocal tone or pitch.	1	2	3	4	5	6	7
3)	Able to identify main ideas or points in messages.	1	2	3	4	5	6	7
4)	Able to read messages from the other's tone of voice.	1	2	3	4	5	6	7
5)	Able to speak using the appropriate volume.	1	2	3	4	5	6	7
6)	Able to convey messages using body language or facial expressions.	1	2	3	4	5	6	7
7)	Able to distinguish fact from opinion in messages.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

	NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7
8)	Able to use body expressively to emphasize messages.	1	2	3	4	5	6 7
9)	Able to pick up messages from the other's eyes or facial expressions.	1	2	3	4	5	6 7
10)	Able to clearly articulate messages or responses.	1	2	3	4	5	6 7
11)	Able to hear both explicit and implicit meanings.	1	2	3	4	5	6 7
12)	Able to pick up messages from the other's body language or posture.	1	2	3	4	5	6 7
13)	Able to pronunciate clearly.	1	2	3	4	5	6 7
14)	Able to speak in a lively and enthusiastic manner.	1	2	3	4	5	6 7
16)	Able to distinguish important messages from unimportant messages.	1	2	3	4	5	6 7
17)	Able to get an indication of mood from the other's body language or facial expressions.	1	2	3	4	5	6 7
18)	Able to show interest or attention using body language (e.g. eye contact, posture, etc.)	1	2	3	4	5	6 7
19)	Able to be open minded to other's opinions and input.	1	2	3	4	5	6 7
20)	Able to use an effective speech rate.	1	2	3	4	5	6 7
21)	Able to show affirmation through body language.	1	2	3	4	5	6 7
22)	Able to give your undivided attention to an other when he/she is speaking.	1	2	3	4	5	6 7
23)	Able to pronounce words correctly.	1	2	3	4	5	6 7
24)	Able to orient your body toward the other.	1	2	3	4	5	6 7

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

25)	Able to pick out key words or phrases to get a mental picture of what is being said.	1	2	3	4	5	6	7
26)	Able to determine the importance of a message from the other's tone of voice.	1	2	3	4	5	6	7
27)	Able to emphasize a point with your hands.	1	2	3	4	5	6	7
28)	Able to patiently let others talk and fully present their ideas.	1	2	3	4	5	6	7
29)	Able to determine other's interest or involvement from his/her body language (e.g. posture, facial cues).	1	2	3	4	5	6	7
30)	Able to convey that you are relaxed or comfortable with a topic using body language (e.g. posture).	1	2	3	4	5	6	7
31)	Able to use a voice that carries or projects.	1	2	3	4	5	6	7
32)	Able to change the environment to facilitate effective listening (e.g. close the door to reduce noise).	1	2	3	4	5	6	7
33)	Able to pick up messages from other's hand gestures.	1	2	3	4	5	6	7
34)	Able to express warmth and friendliness through body language.	1	2	3	4	5	6	7

********** END OF PART ONE **********

PART TWO: YOU COMMUNICATE COMPETENTLY BECAUSE YOU ARE ...

36)	Motivated by a need to communicate well with others.	1	2	3	4	5	6	7
37)	Motivated by a need for acceptance by others.	1	2	3	4	5	6	7
38)	Motivated by a desire to receive more compliments.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

	NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

39)	Motivated by a desire to produce a quality product.	1	2	3	4	5	6	7
40)	Motivated by a need to be appreciated by others.	1	2	3	4	5	6	7
41)	Motivated by a need to help others.	1	2	3	4	5	6	7
42)	Motivated by a desire for promotion or good reviews.	1	2	3	4	5	6	7
43)	Motivated by a desire for personal growth and development.	1	2	3	4	5	6	7
44)	Motivated by a desire to be highly productive.	1	2	3	4	5	6	7
45)	Motivated by a desire to reduce rumors.	1	2	3	4	5	6	7
46)	Motivated by a desire for pay raises.	1	2	3	4	5	6	7
47)	Motivated by a need for respect from others.	1	2	3	4	5	6	7
48)	Motivated by a need for a positive self image/esteem.	1	2	3	4	5	6	7
49)	Motivated by an interest in the subject matter.	1	2	3	4	5	6	7
50)	Motivated by a desire to get more job perks.	1	2	3	4	5	6	7
51)	Motivated by a need to give direction or leadership.	1	2	3	4	5	6	7
52)	Motivated by a desire to get support from others.	1	2	3	4	5	6	7
53)	Motivated by a desire to fully understand problems, resources, and constraints.	1	2	3	4	5	6	7
54)	Motivated by a need for recognition.	1	2	3	4	5	6	7
55)	Motivated by a desire to offer good service.	1	2	3	4	5	6	7
56)	Motivated by a desire to be considered a resource by others.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE 1	2	3 SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

57)	Motivated by a desire to meet other's expectations.	1	2	3	4	5	6	7
58)	Motivated by a need to develop friends/relationships.	1	2	3	4	5	6	7
59)	Motivated by a need to efficiently fulfill job duties.	1	2	3	4	5	6	7
60)	Motivated by a need to be understood by others.	1	2	3	4	5	6	7
61)	Motivated by a need for approval.	1	2	3	4	5	6	7
63)	Motivated by a desire to get things accomplished.	1	2	3	4	5	6	7
64)	Motivated by a desire to avoid problems or surprises associated with poor communication.	1	2	3	4	5	6	7
65)	Motivated by the satisfaction of getting ideas or points across.	1	2	3	4	5	6	7
66)	Motivated by a desire to get suggestions, feedback, or information from others.	1	2	3	4	5	6	7

********** END OF PART TWO **********

PART THREE: HOW WELL DO THE FOLLOWING ITEMS DESCRIBE YOU?

1)	Generally, I'm comfortable while participating in a group discussion.	1	2	3	4	5	6	7
2)	I'm tense and nervous while participating in group discussions.	1	2	3	4	5	6	7
3)	I like getting involved in group discussions.	1	2	3	4	5	6	7
4)	Engaging in group discussions with new people makes me tense and nervous.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

		NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7
5)	I'm calm and relaxed while participating in group discussions.	1	2	3	4	5	6	7
6)	Generally, I am nervous when I have to participate in a meeting.	1	2	3	4	5	6	7
7)	Usually, I am calm and relaxed while I'm participating in meetings.	1	2	3	4	5	6	7
8)	I am very calm and relaxed when I am called upon to express an opinion at a meeting.	1	2	3	4	5	6	7
9)	Communicating at meetings usually makes me uncomfortable.	1	2	3	4	5	6	7
10)	I am very relaxed when I am answering questions at a meeting.	1	2	3	4	5	6	7
11)	While participating in a conversation with a new acquaintance, I feel very nervous.	1	2	3	4	5	6	7
12)	I have no fear of speaking up in conversations.	1	2	3	4	5	6	7
13)	Ordinarily, I am very tense and nervous in conversations.	1	2	3	4	5	6	7
14)	I am afraid to speak up in conversations.	1	2	3	4	5	6	7
16)	Ordinarily, I am very calm and relaxed in conversations.	1	2	3	4	5	6	7
17)	I have no fear of giving a speech.	1	2	3	4	5	6	7
18)	Certain parts of my body feel very tense and rigid while giving a speech.	1	2	3	4	5	6	7
19)	I feel relaxed while giving a speech.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE 1	2	3	SOMEWHAT DESCRIPTIVE 4	5	6	VERY DESCRIPTIVE 7

20)	My thoughts become confused and jumbled when I am giving a speech.	1 2 3 4 5 6 7
21)	I face the prospect of giving a speech with confidence.	1 2 3 4 5 6 7

********** END OF PART THREE **********

VERY FALSE 1	2	3	4	5	6	VERY TRUE 7

PART FOUR: HOW TRUE ARE THE FOLLOWING ITEMS?

22)	You feel certain about how much authority you have.	1 2 3 4 5 6 7
23)	Clear, planned goals and objectives exist for your job.	1 2 3 4 5 6 7
24)	You know that you have divided your time properly.	1 2 3 4 5 6 7
25)	You know what your responsibilities are.	1 2 3 4 5 6 7
26)	You know exactly what is expected of you.	1 2 3 4 5 6 7
27)	Explanation is clear of what has to be done.	1 2 3 4 5 6 7

********** END OF PART FOUR **********

Appendix C: Cover Letter and Questionnaire

STRONGLY DISAGREE						STRONGLY AGREE
1	2	3	4	5	6	7

PART FIVE: HOW MUCH DO YOU AGREE WITH THE FOLLOWING ITEMS?

28)	This organization has a fine tradition of public service.	1	2	3	4	5	6	7
29)	If I had my life to live over again, I would still choose to work for this organization.	1	2	3	4	5	6	7
30)	I really feel as if this organization's problems are my problems.	1	2	3	4	5	6	7
32)	I feel a sense of pride in working for this organization.	1	2	3	4	5	6	7
33)	The record of this organization is an example of what dedicated people can achieve.	1	2	3	4	5	6	7
34)	I would advise a young college graduate to choose a management career in this organization.	1	2	3	4	5	6	7

********** END OF PART FIVE **********

PART SIX: HOW MUCH DO YOU AGREE WITH THE FOLLOWING ITEMS?

35)	The major satisfaction in my life comes from my job.	1	2	3	4	5	6	7
36)	I do what my job description requires; this organization does not have the right to expect more. (R)	1	2	3	4	5	6	7
37)	I don't mind spending a half-hour past quitting time if I can finish a task.	1	2	3	4	5	6	7
38)	The most important things that happen to me involve my work.	1	2	3	4	5	6	7
39)	I live, eat and breathe my job.	1	2	3	4	5	6	7
40)	Most things in life are more important than my work.(R)	1	2	3	4	5	6	7

********** END OF PART SIX **********

Appendix C: Cover Letter and Questionnaire

NOT AT ALL DESCRIPTIVE			SOMEWHAT DESCRIPTIVE			VERY DESCRIPTIVE
1	2	3	4	5	6	7

PART SEVEN: HOW WELL DO THE FOLLOWING ITEMS DESCRIBE YOU?

41)	Before I criticize somebody, I try to imagine how I would feel in their place.	1	2	3	4	5	6	7
42)	If I'm sure, I'm right about something, I don't waste much time listening to other people's arguments.	1	2	3	4	5	6	7
43)	I believe there are two sides to every question and I try to look at both of them.	1	2	3	4	5	6	7
44)	I sometimes find it difficult to see things from the other person's point of view. (R)	1	2	3	4	5	6	7
46)	I try to look at everybody's side of a disagreement before I make a decision.	1	2	3	4	5	6	7
47)	When I am upset at someone, I usually try to put myself in his or her "shoes" for a while.	1	2	3	4	5	6	7
48)	I usually have a knack for saying the right thing to make people feel better when they are upset.	1	2	3	4	5	6	7
49)	I usually respond appropriately to the feelings and emotions of others.	1	2	3	4	5	6	7
50)	Others think of me as a very empathic person.	1	2	3	4	5	6	7
51)	I am the type of person who can say the right thing at the right time.	1	2	3	4	5	6	7
52)	My friends come to me with their problems because I am a good listener.	1	2	3	4	5	6	7

********** END OF PART SEVEN **********

Appendix C: Cover Letter and Questionnaire

NO SATISFACTION 1	2	3	AVERAGE SATISFACTION 4	5	6	MAXIMUM SATISFACTION 7

PART EIGHT: HOW SATISFIED ARE YOU WITH THE ...

53)	Extent to which informal communication is active and accurate.	1	2	3	4	5	6	7
54)	Extent to which the amount of communication in the company is about right.	1	2	3	4	5	6	7
55)	Extent to which the attitudes toward communication in the company are basically healthy.	1	2	3	4	5	6	7
56)	Extent to which the people in my organization have great ability as communicators.	1	2	3	4	5	6	7
57)	Extent to which communication practices are adaptable to emergencies.	1	2	3	4	5	6	7
58)	Extent to which horizontal commmunication with other employees is accurate and free-flowing.	1	2	3	4	5	6	7
59)	Extent to which conflicts are handled appropriately through proper communication channels.	1	2	3	4	5	6	7
60)	Extent to which meetings are well organized.	1	2	3	4	5	6	7
61)	Information about accomplishments and/or failures of the company.	1	2	3	4	5	6	7
63)	Information about company profits and financial standing.	1	2	3	4	5	6	7
64)	Information about changes in the organization.	1	2	3	4	5	6	7
65)	Information about government action affecting my company.	1	2	3	4	5	6	7
66)	Information about company policies and goals.	1	2	3	4	5	6	7
67)	Information about employee benefits and pay.	1	2	3	4	5	6	7

Appendix C: Cover Letter and Questionnaire

	NO SATISFACTION 1	2	3	AVERAGE SATISFACTION 4	5	6	MAXIMUM SATISFACTION 7
68)	Extent to which your superior listens and pays attention to you.	1	2	3	4	5	6 7
69)	Extent to which your supervisor is open to ideas.	1	2	3	4	5	6 7
70)	Extent to which your supervisor offers guidance for solving job related problems.	1	2	3	4	5	6 7
71)	Extent to which your supervisor trusts you.	1	2	3	4	5	6 7
72)	Information about how you are being judged.	1	2	3	4	5	6 7
73)	Information about your progress in your job.	1	2	3	4	5	6 7
74)	Recognition of your efforts.	1	2	3	4	5	6 7
75)	Information about how your job compares with others.	1	2	3	4	5	6 7
76)	Extent to which the grapevine is active in your organization.	1	2	3	4	5	6 7

********** END OF PART EIGHT **********

PART NINE: PLEASE ANSWER THE FOLLOWING.

1) Have you had any previous communication skills training?
   Yes (1)
   No (2)

2) Which of the following reflects the highest educational degree you have attained?
   High School (1)
   Undergraduate (2)
   Graduate (3)

Appendix C: Cover Letter and Questionnaire

3) How long have you worked at your company?

0 - 3 years (1)
3 - 5 years (2)
5 - 10 years (3)
10 - 15 years (4)
15 - 20 years (5)
20 or more years (6)

PLEASE PUT A CHECK MARK NEXT TO THE DEPARTMENT IN WHICH YOU WORK.

	Dept.#	Department		Dept.#	Department
01)	0400	L4 Blocks	14)	6037	Mtl Mgmnt Plt 5
02)	0500	L4 Cam Carriers	15)	6059	Gen Oper Plt 5
03)	0600	L4 Conn Rods	16)	6242	Emissions Lab
04)	0700	L4 Cyl Heads	17)	7012	PT Design
05)	0800	L4 Camshafts	18)	7013	PT Basic Engine
06)	0900	L4 Cranks	19)	7014	PT Systems
07)	1000	L4 Eng Assem	20)	7015	Program Mgt.
08)	4804	L4 Future Progr	21)	7016	PT Adv. Develop.
09)	5133	Tool Grinding P	22)	7019	R & T Validation
10)	5134	Tool Div. Plt	23)	7020	R & T Laboratory
11)	5900	Plt Engrg Plt 5	24)	7021	R & T Mach. Shop
12)	6033	L4 Prod Eng	25)	7028	Cost For Admin.
13)	6036	Q.C. Plt 5	26)	6073	Materials Mgt.

If your department is not listed, please write down the department name and number.

********** END OF PART NINE **********

NOW THAT YOU HAVE COMPLETED THE QUESTIONNAIRE, PLEASE RETURN IT IN THE ATTACHED PRE-ADDRESSED ENVELOPE TO ALAN WRIGHT AT MAIL STOP 2817. THANK YOU FOR YOUR COOPERATION.

Appendix D

Follow-up Letter

Appendix D: Follow-up Letter

September 24, 1990

To: All Product Engineering, Materials, and Plant Five Personnel

From: Large L Product Team

Subject: Communication Questionnaire

By now you should have received a communication questionnaire that is part of a study sanctioned by the Large L Product Team. If you haven't already done so, please take a moment now to fill out the questionnaire and return it in the pre-addressed envelope. We would like to have your response by Thursday, September 27, if possible.

If you have any questions or need another copy of the questionnaire, please contact Alan Wright at 336-1124. Thank you for your timely assistance in this project.

Sincerely,

Alan Wright

Alan Wright
Project Consultant

Appendix E

Communication Competence Scale Retained

Appendix E: Communication Competence Scale Retained

SKILL DIMENSION		FACTOR LOADING
APPROPRIATENESS (Alpha = .91)		
1)	Knows how to say or do the right thing at the right time.	.71
2)	Knows how to determine the appropriate time to deliver messages.	.70
3)	Knows how to convey appropriate deadlines or timeframes.	.67
4)	Knows how to sense others mood's and respond appropriately.	.69
5)	Knows how to be direct and to the point.	.53
6)	Knows how to use body language that is appropriate to the message and other.	.65
7)	Knows how to determine the appropriate things to ask.	.69
8)	Knows how to identify group or departmental norms to determine appropriate responses.	.69
9)	Knows how to deliver a message according to the other's educational level.	.70
10)	Knows how to respond quickly or "be quick on your feet."	.67
11)	Knows how to deliver a message according to the other's knowledge of the project or job.	.79
12)	Knows how to deliver a message according to the other's status level.	.68

Appendix E: Communication Competence Scale Retained

SKILL DIMENSION		FACTOR LOADING
INTERACTION MANAGEMENT (Alpha = .91)		
1)	Knows how to use smooth transitions from one topic to another during interactions.	.59
2)	Knows how to use humor to facilitate smooth interactions.	.65
3)	Knows how to get others involved in conversations.	.73
4)	Knows how to use questions or comments to orient the discussion toward the desired goal.	.76
5)	Knows how to field questions that arise from your message.	.73
6)	Knows how to repeat back or paraphrase an other's comments to ensure understanding.	.80
7)	Knows how to redirect discussions back to the original topic or purpose.	.84
8)	Knows how to state a purpose or agenda for an interaction.	.72
9)	Knows how to nonverbally acknowledge or encourage responses (e.g. nodding, raising eyebrows, etc.).	.57
10)	Knows how to ask others for ideas or feedback.	.75

Appendix E: Communication Competence Scale Retained

SKILL DIMENSION		FACTOR LOADING
PERSPECTIVE TAKING (Alpha = .84)		
1)	Knows how to move from your own view to the other's view.	.59
2)	Knows how to ask an other for his/her perspective.	.63
3)	Knows how to take the role of the other and predict the response he/she might have as a result of a message.	.65
4)	Knows how to determine the problems, constraints, and requirements of an other's position.	.73
5)	Knows how to determine the other's interests and needs.	.82
6)	Knows how to gather information about other so you can determine his/her perspective.	.65
RESPONSE REPERTOIRE (Alpha = .87)		
1)	Knows how to explain something using a variety of different communication techniques.	.72
2)	Knows how to use a large number of response alternatives.	.73
3)	Knows how to use a large variety of communication techniques to deliver messages.	.76
4)	Knows how to come back with a variety of responses.	.76
5)	Knows how to use a diversity of words or phrases.	.79
LANGUAGE STRUCTURE (Alpha = .85)		
1)	Knows how to construct logical, well supported arguments.	.67
2)	Knows how to present ideas in a logical order.	.84
3)	Knows how to construct well-organized messages.	.86
4)	Knows how to communicate using complete sentences.	.68

Appendix E: Communication Competence Scale Retained

SKILL DIMENSION		FACTOR LOADING
ARTICULATION (Alpha = .88)		
1)	Able to speak in a manner that is understandable to others.	.84
2)	Able to clearly articulate messages or responses.	.84
3)	Able to use an effective speech rate.	.77
4)	Able to use a voice that carries or projects.	.75
EXPRESSIVENESS (Alpha = .89)		
1)	Able to use body expressively to emphasize messages.	.84
2)	Able to show affirmation through body language.	.92
3)	Able to emphasize a point with your hands.	.72
4)	Able to convey that you are relaxed or comfortable with a topic using body language (e.g. posture).	.81
LISTENING (Alpha = .78)		
1)	Able to identify main ideas or points in messages.	.81
2)	Able to distinguish fact from opinion in messages.	.65
3)	Able to be open minded to other's opinions and input.	.55
4)	Able to pick out key words or phrases to get a mental picture of what is being said.	.74

Appendix E: Communication Competence Scale Retained

SKILL DIMENSION		FACTOR LOADING
READING NONVERBALS (Alpha = .91)		
1)	Able to read messages from the other's tone of voice.	.85
2)	Able to pick up messages from the other's eyes or facial expressions.	.87
3)	Able to get an indication of mood from the other's body language or facial expressions.	.84
4)	Able to determine other's interest or involvement from his/her body language (e.g. posture, facial cues).	.81
INTRINSIC MOTIVATION (Alpha = .82)		
1)	Motivated by need to communicate well with others.	.67
2)	Motivated by a desire to produce a quality product.	.68
3)	Motivated by a need to help others.	.73
4)	Motivated by a desire to offer good service.	.79
5)	Motivated by the satisfaction of getting ideas or points across.	.60
EXTRINSIC MOTIVATION (Alpha = .80)		
1)	Motivated by a need for acceptance by others.	.66
2)	Motivated by a desire to receive more compliments.	.74
3)	Motivated by a desire for promotion or good reviews.	.67
4)	Motivated by a need for recognition.	.74

Appendix F

Communication Competence Scale Residuals

Appendix F: Communication Competence Scale Residuals

SKILL DIMENSION		FACTOR LOADING
APPROPRIATENESS		
1)	How to deliver brief, concise, complete messages.	.60 **
2)	How to deliver a message without excessive use of jargon or acronyms.	.54 *
3)	How to use the terminology or jargon of the other.	.53 *
4)	How to provide the appropriate amount of detail in messages.	.74 **
INTERACTION MANAGEMENT		
1)	How to get others to contribute their expertise and knowledge to the interaction.	.53 *
2)	How to not interrupt and let other have his/her say.	.33 *
3)	How to manage conflict in interactions.	.52 **
4)	How to follow an agenda during an interaction.	.65 *
5)	How to disagree without offending or alienating	.70 *
6)	How to integrate other's comments into conversations or presentations.	.69 **
7)	How to speak without being antagonistic or abusive	.48 *
PERSPECTIVE TAKING		
1)	How to take the view of others who are directly working on a particular project.	.65 *
2)	How to put yourself in an other's shoes to determine which message would best fit his/her perspective.	.64 **
3)	How to bring up ideas from an other's point of view.	.74 **

* Item dropped because of a problem with internal consistency
** Item dropped because of a problem with parallelism

Appendix F: Communication Competence Scale Residuals

SKILL DIMENSION		FACTOR LOADING
RESPONSE REPERTOIRE		
1)	How to deliver the same message in a variety of ways.	.73 **
2)	How to tap into a reservoir of words and phrases when creating messages.	.75 *
LANGUAGE STRUCTURE		
1)	How to create messages using proper grammar.	.73 *
2)	How to communicate complex ideas in a simple way.	.56 *
3)	How to present ideas in a systematic, organized way.	.80 **
ARTICULATION		
1)	Able to speak using the appropriate volume.	.68 *
2)	Able to pronunciate clearly.	.74 **
3)	Able to pronounce words correctly.	.70 *
EXPRESSIVENESS		
1)	Able to emphasize messages by shifting your vocal tone or pitch.	.75 *
2)	Able to convey messages using body language or facial expressions.	.80 **
3)	Able to speak in a lively and enthusiastic manner.	.64 **
4)	Able to show interest or attention using body language (e.g. eye contact, posture, etc.).	.80 **
5)	Able to orient your body toward the other.	.70 *
6)	Able to express warmth and friendliness through body language.	.68 **

* Item dropped because of a problem with internal consistency
** Item dropped because of a problem with parallelism

Appendix F: Communication Competence Scale Residuals

SKILL DIMENSION		FACTOR LOADING
LISTENING		
1)	Able to hear both explicit and implicit meanings.	.64 **
2)	Able to distinguish important messages from unimportant messages.	.76 **
3)	Able to give your undivided attention to an other when he/she is speaking.	.61 **
4)	Able to patiently let others talk and fully present their ideas.	.55 *
5)	Able to change the environment to facilitate effective listening (e.g. close the door to reduce noise).	.66 **
READING NONVERBALS		
1)	Able to pick up messages from the other's body language/posture.	.88 **
2)	Able to determine the importance of a message from the other's tone of voice.	.78 **
3)	Able to pick up messages from other's hand gestures.	.60 *
INTRINSIC MOTIVATORS		
1)	Motivated by a desire for personal growth and development.	.71 **
2)	Motivated by a desire to be highly productive.	.78 **
3)	Motivated by a need for a positive self image/esteem.	.61 **
4)	Motivated by an interest in the subject matter.	.55 **
5)	Motivated by a need to give direction or leadership.	.46 *
6)	Motivated by a desire to fully understand problems, resources, and constraints.	.66 **
7)	Motivated by a need to develop friends/relationships.	.45 *

* Item dropped because of a problem with internal consistency
** Item dropped because of a problem with parallelism

Appendix F: Communication Competence Scale Residuals

SKILL DIMENSION		FACTOR LOADING
EXTRINSIC MOTIVATORS		
1)	Motivated by a need to be appreciated by others.	.73 **
2)	Motivated by a desire to reduce rumors.	.42 *
3)	Motivated by a desire for pay raises.	.61 **
4)	Motivated by a need for respect from others.	.73 **
5)	Motivated by a desire to get more job perks.	.60 *
6)	Motivated by a desire to get support from others.	.55 **
7)	Motivated by a desire to be considered a resource by others.	.58 **
8)	Motivated by a desire to meet other's expectations.	.62 **
9)	Motivated by a need to be understood by others.	.60 **
10)	Motivated by a need for approval.	.63 **
11)	Motivated by a desire to avoid problems or surprises associated with poor communication.	.39 *
12)	Motivated by a desire to get suggestions, feedback, or information from others.	.41 *

* Item dropped because of a problem with internal consistency
** Item dropped because of a problem with parallelism

Appendix G

Internal Consistency Matrices

For Retained Communication Competence Factors

Appendix G.1: Internal Consistency Matrix - Appropriateness (Alpha = .91)

Observed Correlation Matrix

Item	1	2	3	4	5	6	7	8	9	10	11	12
1	.50											
2	.51	.48										
3	.46	.48	.44									
4	.48	.54	.42	.48								
5	.37	.37	.45	.25	.28							
6	.41	.48	.44	.53	.26	.42						
7	.56	.54	.50	.52	.42	.36	.47					
8	.56	.49	.47	.50	.38	.40	.51	.48				
9	.38	.45	.47	.49	.37	.46	.42	.51	.49			
10	.56	.45	.43	.44	.34	.44	.46	.49	.46	.45		
11	.58	.45	.47	.52	.44	.53	.52	.46	.63	.61	.63	
12	.43	.44	.40	.49	.43	.55	.34	.42	.58	.39	.63	.46

Predicted Correlation Matrix

Item	1	2	3	4	5	6	7	8	9	10	11	12
1	-											
2	.49	-										
3	.47	.46	-									
4	.49	.48	.46	-								
5	.38	.37	.35	.37	-							
6	.46	.45	.43	.45	.34	-						
7	.49	.48	.46	.48	.37	.44	-					
8	.49	.48	.46	.48	.37	.45	.48	-				
9	.49	.49	.46	.48	.37	.45	.48	.48	-			
10	.48	.47	.45	.47	.36	.44	.46	.47	.47	-		
11	.56	.55	.53	.55	.42	.51	.54	.55	.55	.53	-	
12	.48	.47	.45	.47	.36	.44	.47	.47	.48	.46	.54	-

Deviation Matrix

Item	1	2	3	4	5	6	7	8	9	10	11	12
1	-											
2	.01	-										
3	-.02	.02	-									
4	-.01	.06	-.04	-								
5	-.01	.00	.10	-.12	-							
6	-.04	.03	.01	.08	-.09	-						
7	.07	.07	.04	.05	.05	-.09	-					
8	.07	.01	.01	.02	.01	-.04	.03	-				
9	-.12	-.04	.01	.01	.00	.01	-.06	.02	-			
10	.08	-.02	-.01	-.03	-.02	.00	-.01	.02	-.02	-		
11	.02	-.10	-.05	-.03	.01	.02	-.03	-.09	.08	.07	-	
12	-.06	-.04	-.05	.02	.07	.11	-.13	-.05	.11	-.07	.09	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 5 percent.

Appendix G.2: Internal Consistency Matrix - Interaction Management (Alpha = .91)

Observed Correlation Matrix

Item	1	2	3	4	5	6	7	8	9	10
1	.35									
2	.41	.43								
3	.44	.55	.53							
4	.38	.50	.64	.58						
5	.42	.44	.42	.57	.53					
6	.47	.49	.54	.62	.65	.64				
7	.47	.54	.53	.67	.67	.69	.71			
8	.45	.40	.46	.58	.62	.66	.65	.52		
9	.42	.37	.43	.38	.42	.42	.49	.30	.32	
10	.41	.53	.67	.52	.46	.54	.62	.52	.50	.55

Predicted Correlation Matrix

Item	1	2	3	4	5	6	7	8	9	10
1	-									
2	.39	-								
3	.43	.48	-							
4	.45	.50	.55	-						
5	.43	.47	.53	.55	-					
6	.47	.52	.58	.61	.58	-				
7	.50	.55	.62	.64	.61	.67	-			
8	.43	.47	.53	.55	.52	.58	.61	-		
9	.33	.37	.41	.43	.41	.45	.48	.41	-	
10	.44	.49	.54	.57	.54	.60	.63	.54	.42	-

Deviation Matrix

Item	1	2	3	4	5	6	7	8	9	10
1	-									
2	.03	-								
3	.01	.08	-							
4	-.07	.01	.08	-						
5	-.01	-.04	-.11	.02	-					
6	.00	-.03	-.04	.01	.07	-				
7	-.03	-.01	-.09	.02	.05	.01	-			
8	.02	-.07	-.06	.03	.09	.08	.04	-		
9	.09	.00	.01	-.05	.01	-.04	.01	-.11	-	
10	-.03	.04	.12	-.05	-.08	-.06	-.01	-.02	.08	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 13 percent.

Appendix G.3: Internal Consistency Matrix - Perspective Taking (Alpha = .84)

Observed Correlation Matrix

Item	1	2	3	4	5	6
1	.35					
2	.42	.42				
3	.50	.31	.40			
4	.37	.41	.47	.53		
5	.44	.57	.49	.66	.67	
6	.31	.50	.40	.52	.50	.43

Predicted Correlation Matrix

Item	1	2	3	4	5	6
1	-					
2	.38	-				
3	.37	.41	-			
4	.43	.47	.46	-		
5	.48	.53	.52	.60	-	
6	.38	.42	.41	.48	.54	-

Deviation Matrix

Item	1	2	3	4	5	6
1	-					
2	.04	-				
3	.13	-.10	-			
4	-.06	-.06	.01	-		
5	-.04	.04	-.03	.06	-	
6	-.07	.08	-.02	.05	-.03	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 7 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.4: Internal Consistency Matrix - Response Repertoire (Alpha = .87)

Observed Correlation Matrix

Item	1	2	3	4	5
1	.51				
2	.55	.54			
3	.56	.63	.57		
4	.55	.49	.51	.58	
5	.51	.54	.57	.72	.62

Predicted Correlation Matrix

Item	1	2	3	4	5
1	-				
2	.52	-			
3	.54	.55	-		
4	.54	.55	.57	-	
5	.57	.58	.60	.60	-

Deviation Matrix

Item	1	2	3	4	5
1	-				
2	.03	-			
3	.02	.07	-		
4	.01	-.06	-.06	-	
5	-.05	-.04	-.03	.12	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 10 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.5: Internal Consistency Matrix - Language Structure (Alpha = .85)

Observed Correlation Matrix

Item	1	2	3	4
1	.45			
2	.63	.70		
3	.56	.68	.74	
4	.40	.55	.66	.47

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.56	-		
3	.58	.72	-	
4	.46	.57	.59	-

Deviation Matrix

Item	1	2	3	4
1	-			
2	.07	-		
3	-.02	-.05	-	
4	-.05	-.02	.07	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 17 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.6: Internal Consistency Matrix - Articulation (Alpha = .88)

Observed Correlation Matrix

Item	1	2	3	4
1	.71			
2	.76	.70		
3	.59	.65	.59	
4	.64	.58	.62	.57

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.71	-		
3	.64	.64	-	
4	.64	.63	.58	-

Deviation Correlation Matrix

Item	1	2	3	4
1	-			
2	.05	-		
3	-.06	.01	-	
4	.01	-.06	.05	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 17 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p.<.05$).

Appendix G.7: Internal Consistency Matrix - Expressiveness (Alpha = .89)

Observed Correlation Matrix

Item	1	2	3	4
1	.71			
2	.78	.85		
3	.65	.62	.52	
4	.64	.79	.58	.66

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.78	-		
3	.61	.67	-	
4	.68	.75	.58	-

Deviation Matrix

Item	1	2	3	4
1	-			
2	.00	-		
3	.04	-.04	-	
4	-.04	.04	.00	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 33 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.8: Internal Consistency Matrix - Listening (Alpha = .78)

Observed Correlation Matrix

Item	1	2	3	4
1	.65			
2	.56	.43		
3	.45	.33	.31	
4	.58	.48	.43	.54

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.53	-		
3	.45	.36	-	
4	.60	.48	.41	-

Deviation Matrix

Item	1	2	3	4
1	-			
2	.03	-		
3	.00	-.03	-	
4	-.02	.00	.02	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.9: Internal Consistency Matrix - Reading Nonverbals (Alpha = .91)

Observed Correlation Matrix

Item	1	2	3	4
1	.72			
2	.70	.75		
3	.73	.74	.70	
4	.69	.72	.65	.66

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.73	-		
3	.71	.73	-	
4	.68	.70	.68	-

Deviation Matrix

Item	1	2	3	4
1	-			
2	-.03	-		
3	.02	.01	-	
4	.01	.02	-.03	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix G.10: Internal Consistency Matrix - Intrinsic Motivator (Alpha = .82)

Observed Correlation Matrix

Item	1	2	3	4	5
1	.45				
2	.48	.47			
3	.45	.53	.53		
4	.49	.56	.57	.63	
5	.44	.33	.44	.50	.36

Predicted Correlation Matrix

Item	1	2	3	4	5
1	-				
2	.45	-			
3	.49	.50	-		
4	.53	.54	.58	-	
5	.40	.41	.43	.47	-

Deviation Matrix

Item	1	2	3	4	5
1	-				
2	.03	-			
3	-.03	.03	-		
4	-.04	.02	.00	-	
5	.04	-.07	.01	.03	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p.<.05$).

Appendix G.11: Internal Consistency Matrix - Extrinsic Motivator (Alpha = .80)

Observed Correlation Matrix

Item	1	2	3	4
1	.44			
2	.60	.54		
3	.41	.42	.45	
4	.41	.51	.61	.54

Predicted Correlation Matrix

Item	1	2	3	4
1	-			
2	.49	-		
3	.44	.49	-	
4	.49	.54	.49	-

Deviation Matrix

Item	1	2	3	4
1	-			
2	.11	-		
3	-.04	-.08	-	
4	-.08	-.03	.11	-

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix H

Internal Consistency Matrices

For Second-Order Factors

Appendix H.1: Internal Consistency Matrix - Second-Order Factor (Alpha = .95)

Observed Correlation Matrix

Item	AP	IM	PT	RR	LS	AT	EX	LI	NV	IM	EM	FL
APPROPRIATENESS-AP	.84											.92
INTERACTION MGT.-IM	.88	.85										.92
PERSPECTIVE TAKING-PT	.87	.82	.67									.82
RESPONSE REP.-RR	.80	.85	.70	.76								.87
LANGUAGE STRUCT.-LS	.75	.74	.56	.79	.57							.76
ARTICULATION-AT	.75	.80	.62	.76	.77	.71						.85
EXPRESSIVENESS-EX	.69	.68	.64	.67	.44	.69	.58					.76
LISTENING-LI	.69	.73	.65	.68	.65	.71	.63	.68				.82
READING NONVERBALS-NV	.69	.66	.64	.62	.51	.65	.78	.77	.64			.80
INTRINSIC MOTIV.-IM	.67	.69	.65	.63	.58	.63	.60	.69	.61	.62		.79
EXTRINSIC MOTIV.-EM	.44	.41	.39	.43	.32	.34	.30	.36	.47	.57	.24	.49

Predicted Correlation Matrix

Item	AP	IM	PT	RR	LS	AT	EX	LI	NV	IM	EM
APPROPRIATENESS-AP	-										
INTERACTION MGT.-IM	.84	-									
PERSPECTIVE TAKING-PT	.75	.75	-								
RESPONSE REP.-RR	.80	.80	.71	-							
LANGUAGE STRUCT.-LS	.69	.70	.62	.66	-						
ARTICULATION-AT	.77	.78	.69	.74	.64	-					
EXPRESSIVENESS-EX	.70	.70	.62	.67	.58	.64	-				
LISTENING-LI	.75	.76	.67	.72	.62	.69	.63	-			
READING NONVERBALS-NV	.73	.74	.65	.70	.61	.68	.61	.66	-		
INTRINSIC MOTIV.-IM	.72	.73	.65	.69	.60	.67	.60	.65	.63	-	
EXTRINSIC MOTIV.-EM	.45	.45	.40	.42	.37	.41	.37	.40	.39	.38	-

Deviation Matrix

Item	AP	IM	PT	RR	LS	AT	EX	LI	NV	IM	EM
APPROPRIATENESS-AP	. -										
INTERACTION MGT.-IM	.04	. -									
PERSPECTIVE TAKING-PT	*.12	.06	. -								
RESPONSE REP.-RR	.00	.04	-.02	. -							
LANGUAGE STRUCT.-LS	.06	.04	-.06	*.12	. -						
ARTICULATION-AT	-.03	.02	-.07	.02	*.13	. -					
EXPRESSIVENESS-EX	-.01	-.02	.02	.00	*.14	.05	. -				
LISTENING-LI	-.06	-.03	-.03	-.04	.03	.01	.00. -				
READING NONVERBALS-NV	-.04	-.07	-.02	-.08	-.10	-.03	*.17	*.11	. -		
INTRINSIC MOTIV.-IM	-.06	-.04	.01	-.06	-.02	-.03	.00	.04	-.02	. -	
EXTRINSIC MOTIV.-EM	-.01	-.04	-.01	.01	-.05	-.07	-.07	-.04	.09	*.19	. -

The percentage of significant deviations for the Spearman test was 13 percent.
The percentage of significant deviations for the Flatness test was 40 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p.<.05$).

Appendix H.2: Internal Consistency Matrix - Second-Order Factor Without Language Structure (Alpha = .95)

Observed Correlation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	NV	IM	EM	FL
APPROPRIATENESS-AP	.82										.91
INTERACTION MGT.-IM	.88	.84									.92
PERSPECTIVE TAKING-PT	.87	.82	.69								.83
RESPONSE REP.-RR	.80	.85	.70	.73							.85
ARTICULATION-AT	.75	.80	.62	.76	.68						.83
EXPRESSIVENESS-EX	.69	.68	.64	.67	.69	.62					.79
LISTENING-LI	.69	.73	.65	.68	.71	.63	.67				.82
READING NONVERBALS-NV	.69	.66	.64	.62	.65	.78	.77	.67			.82
INTRINSIC MOTIV.-IM	.67	.69	.65	.63	.63	.60	.69	.61	.63		.79
EXTRINSIC MOTIV.-EM	.44	.41	.39	.43	.34	.30	.36	.47	.57	.24	.49

Predicted Correlation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	NV	IM	EM
APPROPRIATENESS-AP	-									
INTERACTION MGT.-IM	.83	-								
PERSPECTIVE TAKING-PT	.75	.76	-							
RESPONSE REP.-RR	.77	.78	.71	-						
ARTICULATION-AT	.75	.76	.68	.70	-					
EXPRESSIVENESS-EX	.71	.72	.65	.67	.65	-				
LISTENING-LI	.74	.75	.68	.70	.67	.64	-			
READING NONVERBALS-NV	.74	.75	.68	.70	.67	.64	.67	-		
INTRINSIC MOTIV.-IM	.72	.73	.66	.68	.65	.62	.65	.65	-	
EXTRINSIC MOTIV.-EM	.45	.45	.41	.42	.41	.39	.40	.40	.39	-

Deviation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	NV	IM	EM
APPROPRIATENESS-AP	.	-								
INTERACTION MGT.-IM	.05	.	-							
PERSPECTIVE TAKING-PT	*.11	.06	.	-						
RESPONSE REP.-RR	.03	.07	-.01	.	-					
ARTICULATION-AT	-.00	.04	-.06	.06	.	-				
EXPRESSIVENESS-EX	-.02	-.04	-.01	-.00	.05	.	-			
LISTENING-LI	-.05	-.02	-.03	-.02	.03	-.02	.	-		
READING NONVERBALS-NV	-.05	-.08	-.04	-.08	-.03	*.14	.10	.	-	
INTRINSIC MOTIV.-IM	-.05	-.04	.00	-.05	-.02	-.02	.04	-.04	.	-
EXTRINSIC MOTIV.-EM	-.01	-.04	-.02	.01	-.07	-.08	-.04	.07	*.18	.

The percentage of significant deviations for the Spearman test was 7 percent.
The percentage of significant deviations for the Flatness test was 38 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix H.3: Internal Consistency Matrix - Second-Order Factor Without Language Structure And Reading Nonverbals (Alpha = .94)

Observed Correlation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	IM	EM	FL
APPROPRIATENESS-AP	.84									.92
INTERACTION MGT.-IM	.88	.87								.93
PERSPECTIVE TAKING-PT	.87	.82	.70							.84
RESPONSE REP.-RR	.80	.85	.70	.75						.87
ARTICULATION-AT	.75	.80	.62	.76	.69					.83
EXPRESSIVENESS-EX	.69	.68	.64	.67	.69	.58				.76
LISTENING-LI	.69	.73	.65	.68	.71	.63	.64			.80
INTRINSIC MOTIV.-IM	.67	.69	.65	.63	.63	.60	.69	.64		.80
EXTRINSIC MOTIV.-EM	.44	.41	.39	.43	.34	.30	.36	.57	.23	.48

Predicted Correlation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	IM	EM
APPROPRIATENESS-AP	-								
INTERACTION MGT.-IM	.85	-							
PERSPECTIVE TAKING-PT	.76	.78	-						
RESPONSE REP.-RR	.79	.81	.72	-					
ARTICULATION-AT	.76	.77	.69	.72	-				
EXPRESSIVENESS-EX	.70	.71	.63	.66	.63	-			
LISTENING-LI	.73	.74	.67	.69	.66	.61	-		
INTRINSIC MOTIV.-IM	.73	.74	.67	.69	.66	.61	.64	-	
EXTRINSIC MOTIV.-EM	.44	.45	.40	.42	.40	.37	.38	.38	-

Deviation Matrix

Item	AP	IM	PT	RR	AT	EX	LI	IM	EM
APPROPRIATENESS-AP	. -								
INTERACTION MGT.-IM	.03	. -							
PERSPECTIVE TAKING-PT	*.10	.04	. -						
RESPONSE REP.-RR	.01	.04	-.03	. -					
ARTICULATION-AT	-.01	.03	-.07	.04	. -				
EXPRESSIVENESS-EX	-.01	-.03	.01	.01	.06	. -			
LISTENING-LI	-.04	-.01	-.02	-.01	.05	.02	. -		
INTRINSIC MOTIV.-IM	-.07	-.06	-.02	-.06	-.03	-.01	.05	. -	
EXTRINSIC MOTIV.-EM	-.01	-.04	-.01	.01	-.06	-.06	-.02	*.19	. -

The percentage of significant deviations for the Spearman test was 6 percent.
The percentage of significant deviations for the Flatness test was 39 percent.

Note: Item numbers correspond to items in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation (p.<.05).

Appendix H.4: Internal Consistency Matrix - Second-Order Cognitive Component Factor (Alpha = .95)

Observed Correlation Matrix

Item	AP	IM	PT	RR	LS	FL
APPROPRIATENESS-AP	.91					.96
INTERACTION MGT.-IM	.88	.90				.95
PERSPECTIVE TAKING-PT	.87	.82	.68			.82
RESPONSE REP.-RR	.80	.85	.70	.80		.89
LANGUAGE STRUCT.-LS	.75	.74	.56	.79	.61	.78

Predicted Correlation Matrix

Item	AP	IM	PT	RR	LS
APPROPRIATENESS-AP	-				
INTERACTION MGT.-IM	.91	-			
PERSPECTIVE TAKING-PT	.78	.78	-		
RESPONSE REP.-RR	.85	.85	.73	-	
LANGUAGE STRUCT.-LS	.75	.74	.64	.70	-

Deviation Matrix

Item	AP	IM	PT	RR	LS
APPROPRIATENESS-AP	. -				
INTERACTION MGT.-IM	-.03	. -			
PERSPECTIVE TAKING-PT	*.08	.04	. -		
RESPONSE REP.-RR	-.05	-.00	-.04	. -	
LANGUAGE STRUCT.-LS	.00	-.01	*.08	*.09	. -

The percentage of significant deviations for the Spearman test was 30 percent.
The percentage of significant deviations for the Flatness test was 30 percent.

Note: Items refer to dimensions in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix H.5: Internal Consistency Matrix - Second-Order Cognitive Component Factor Without Language Structure (Alpha = .95)

Observed Correlation Matrix

Item	AP	IM	PT	RR	FL
APPROPRIATENESS-AP	.91				.95
INTERACTION MGT.-IM	.88	.91			.95
PERSPECTIVE TAKING-PT	.87	.82	.75		.86
RESPONSE REP.-RR	.80	.85	.70	.72	.85

Predicted Correlation Matrix

Item	AP	IM	PT	RR
APPROPRIATENESS-AP	-			
INTERACTION MGT.-IM	.91	-		
PERSPECTIVE TAKING-PT	.82	.82	-	
RESPONSE REP.-RR	.81	.81	.73	-

Deviation Matrix

Item	AP	IM	PT	RR
APPROPRIATENESS-AP	. -			
INTERACTION MGT.-IM	-.03	. -		
PERSPECTIVE TAKING-PT	.04	-.01	. -	
RESPONSE REP.-RR	-.01	.04	-.04	. -

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 17 percent.

Note: Items refer to dimensions in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix H.6: Internal Consistency Matrix - Second-Order Behavioral Component Factor (Alpha = .92)

Observed Correlation Matrix

Item	At	EX	LI	NV
ARTICULATION-AT	.68			
EXPRESSIVENESS-EX	.77	.77		
LISTENING-LI	.72	.70	.74	
READING NONVERBALS-NV	.66	.77	.79	.75

Predicted Correlation Matrix

Item	At	EX	LI	NV
ARTICULATION-AT	-			
EXPRESSIVENESS-EX	.72	-		
LISTENING-LI	.71	.76	-	
READING NONVERBALS-NV	.71	.76	.75	-

Deviation Matrix

Item	At	EX	LI	NV
ARTICULATION-AT	. -			
EXPRESSIVENESS-EX	.05	. -		
LISTENING-LI	.01	-.05	. -	
READING NONVERBALS-NV	-.06	.01	.05	. -

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Items refer to dimensions in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation (p.<.05).

Appendix H.7: Internal Consistency Matrix - Second-Order Motivational Component Factor (Alpha = .74)

Observed Correlation Matrix

Item	IM	EM
INTRINSIC MOTIV.-IM	.61	
EXTRINSIC MOTIV.-EM	.58	.61

Predicted Correlation Matrix

Item	IM	EM
INTRINSIC MOTIV.-IM	. -	
EXTRINSIC MOTIV.-EM	.58	. -

Deviation Matrix

Item	IM	EM
INTRINSIC MOTIV.-IM	. -	
EXTRINSIC MOTIV.-EM	.00	. -

The percentage of significant deviations for the Spearman test was 0 percent.
The percentage of significant deviations for the Flatness test was 0 percent.

Note: Items refer to dimensions in Appendix E (Retained Scale). Communalities in the diagonal of observed matrix. An asterisk indicates a significant deviation ($p. < .05$).

Appendix I

First-Order Factor Exploratory Factor Analysis

Appendix I.1A: First-Order Factor Exploratory Factor Analysis: Skill Items

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
AP1	.58958	*	1	24.44462	46.1	46.1
AP3	.55771	*	2	2.96594	5.6	51.7
AP4	.60627	*	3	1.79064	3.4	55.1
AP5	.61632	*	4	1.39786	2.6	57.7
AP6	.56717	*	5	1.20111	2.3	60.0
AP7	.64902	*	6	1.03153	1.9	61.9
AP8	.54748	*	7	.90968	1.7	63.7
AP9	.55080	*	8	.78286	1.5	65.1
AP10	.69528	*	9	.68341	1.3	66.4
AP11	.65631	*				
AP12	.73214	*				
AP14	.66283	*				
IM1	.46530	*				
IM2	.59920	*				
IM3	.69707	*				
IM4	.65237	*				
IM6	.62504	*				
IM7	.66541	*				
IM8	.74802	*				
IM9	.60193	*				
IM10	.62781	*				
IM12	.70331	*				
PT1	.46152	*				
PT4	.54850	*				
PT5	.63490	*				
PT6	.60155	*				
PT7	.66729	*				
PT8	.52463	*				
RR1	.61327	*				
RR2	.84637	*				
RR3	.64754	*				
RR4	.70251	*				
RR5	.74235	*				
LS1	.54497	*				
LS2	.66820	*				
LS3	.80145	*				
LS4	.64818	*				
AT1	.79765	*				
AT2	.76104	*				
AT4	.74578	*				
AT5	.68371	*				
EX2	.78312	*				
EX5	.84432	*				
EX7	.69460	*				
EX8	.78590	*				
LI1	.73947	*				
LI2	.48383	*				
LI5	.76259	*				
LI7	.63734	*				
NV1	.80163	*				
NV2	.76128	*				
NV4	.78738	*				
NV6	.66840	*				

Appendix I.1A: First-Order Factor Exploratory Factor Analysis: Skill Items

PATTERN MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.08109	-.11517	.20483	.35227	.24667
AP3	-.17689	.05509	.17032	-.05139	.29884
AP4	.04375	.12670	.29165	-.10591	.14421
AP5	-.15364	-.01093	.35152	.25649	.26706
AP6	-.01779	-.08227	-.04314	.09310	-.13242
AP7	-.07197	.52846	.20259	.00724	.10393
AP8	.09403	.04454	.40025	.12374	.11777
AP9	-.02501	-.13469	.24905	.09407	.18801
AP10	.12344	.16632	.03421	-.01892	.32229
AP11	.24775	-.07891	.13738	.11074	.05729
AP12	.36474	.05378	.12036	.18696	-.00727
AP14	.10391	.11592	-.00458	.05194	-.00607
IM1	.14903	.21056	.26298	.12072	.29738
IM2	.19633	.05003	.23468	.32560	-.01925
IM3	.16044	.11789	.36416	-.00918	.05256
IM4	.39481	-.01994	.13293	.00879	.19119
IM6	.37099	.12043	-.05130	.07016	.12532
IM7	.38452	.04853	-.06012	.05326	.17641
IM8	.49579	.25856	-.02159	.03081	-.02868
IM9	.32103	.09425	.00673	.00379	.07821
IM10	.06250	.64715	.06642	.03158	.17345
IM12	.16194	.18857	.18126	.09719	.01452
PT1	.10317	-.01560	.26975	-.10583	.16351
PT4	-.03973	.13993	.45553	.15340	-.01520
PT5	-.06092	.09921	.17921	.10225	.29890
PT6	.23667	.07193	.19526	.15089	-.18324
PT7	.10055	.15563	.26718	.01374	-.18102
PT8	.25784	.34178	.26575	.02556	-.02205
RR1	.26887	.07285	-.01675	.15328	.38458
RR2	.11351	.22896	-.01877	.03324	.81157
RR3	-.07486	.03065	.06064	.04094	.53735
RR4	.39599	.11119	.05435	-.04180	.09872
RR5	.29521	.00307	-.09738	.01949	.24480
LS1	.31689	.02619	-.05566	.15510	.26054
LS2	.15764	-.08700	-.11344	.27435	.40449
LS3	.01935	-.12710	-.13620	.04739	.39745
LS4	.07421	.00959	-.39110	.19017	.16951
AT1	.23326	.06069	-.29019	.36783	.17007
AT2	.20205	.14614	-.14793	.23858	.07315
AT4	.04726	.29973	-.15871	.03105	.01668
AT5	.04412	.39967	-.25582	-.12443	.08584
EX2	.03082	.74745	.08698	.07559	-.08262
EX5	-.15717	.65440	-.08387	.06929	.07940
EX7	.16127	.79687	-.01805	.11277	.04085
EX8	-.19394	.53489	-.10881	.05997	.10891
LI1	.13622	.10858	-.20042	.47460	.09856
LI2	.20064	-.08873	-.00605	.54812	.03422
LI5	.04413	-.06247	-.09678	.14532	-.06309
LI7	-.02637	.19825	-.00305	.51383	.18717
NV1	-.12763	.21873	.06635	.67824	-.12304
NV2	-.11856	.37537	.06070	.50334	-.04235
NV4	-.22685	.37374	.11137	.46104	.14458
NV6	-.17768	.20192	-.01465	.39518	.14926

Appendix I.1A: First-Order Factor Exploratory Factor Analysis: Skill Items

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9
AP1	-.05108	.12767	.20179	-.10567
AP3	.08129	.21957	.27463	-.18748
AP4	.07238	-.08221	.52743	-.06396
AP5	.13061	.17773	.05714	-.10001
AP6	.22867	.06018	.64168	-.04213
AP7	.19154	.03375	.05124	-.10473
AP8	.03745	.07714	.25406	-.04856
AP9	.29840	.11085	.11316	-.22793
AP10	.47960	-.10032	.04567	-.09764
AP11	.06152	-.00165	.01266	-.56443
AP12	.27456	.20691	.09825	-.06441
AP14	.62904	.14347	.14939	.12476
IM1	-.06974	-.05802	.14401	-.00363
IM2	-.06132	.00329	.04227	-.38246
IM3	-.16870	.18451	.29261	-.27897
IM4	.19722	.15950	.10501	-.09438
IM6	.28337	-.00832	.07823	-.14646
IM7	.18462	.16455	.13396	-.10962
IM8	.09851	.25073	.09364	-.09196
IM9	.27170	.07628	.27685	-.01860
IM10	.04523	.02771	.03052	.05287
IM12	-.06579	.45908	.28979	.07845
PT1	.03776	.44078	.11757	.01583
PT4	.36881	-.01694	-.02414	-.04126
PT5	.01360	.36619	.19161	-.00214
PT6	.30914	.06038	.16628	-.18534
PT7	.31090	.22274	.21028	-.16243
PT8	.22133	-.03081	.07867	-.00630
RR1	-.14625	.16705	.05891	-.14752
RR2	.06750	.06223	-.17279	.09391
RR3	.05930	.04586	.09978	-.27233
RR4	.16352	.14579	-.04300	-.35734
RR5	.35412	.11151	-.19756	-.37615
LS1	-.08485	.01252	.21810	-.14385
LS2	.11108	-.09343	.29327	-.04354
LS3	.44025	-.05078	.27885	-.16966
LS4	.22892	-.07939	.27242	-.25315
AT1	.05104	.10073	.26379	-.10876
AT2	-.04822	-.09064	.42000	-.29222
AT4	-.15246	.24904	.10759	-.54052
AT5	.05793	.17888	.29803	-.27872
EX2	-.00644	.00223	-.00950	-.22546
EX5	.14560	.21730	-.02873	-.16075
EX7	-.04917	-.05967	.02875	.13004
EX8	.12179	.41157	-.06945	-.08164
LI1	.07522	.17921	.31269	.14458
LI2	.10293	.06760	.00511	-.02276
LI5	.02079	.86102	-.12643	-.04548
LI7	.12634	.03134	-.01552	-.04494
NV1	-.03411	.27671	.02036	.00782
NV2	.01185	.00987	.00163	-.27583
NV4	.21176	.06043	-.15121	-.09281
NV6	.01523	.26058	.14118	-.07409

Appendix I.1A: First-Order Factor Exploratory Factor Analysis: Skill Items

FACTOR CORRELATION MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
FACTOR 1	1.00000				
FACTOR 2	.18431	1.00000			
FACTOR 3	.08982	.19564	1.00000		
FACTOR 4	.23894	.41329	.10941	1.00000	
FACTOR 5	.31423	.33134	.13543	.34606	1.00000
FACTOR 6	.29494	.28823	.18136	.31335	.34265
FACTOR 7	.18936	.40115	.19586	.40852	.28572
FACTOR 8	.38679	.23416	.18145	.34286	.37513
FACTOR 9	-.35947	-.34271	-.14891	-.38797	-.38639

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9
FACTOR 6	1.00000			
FACTOR 7	.26559	1.00000		
FACTOR 8	.36362	.30627	1.00000	
FACTOR 9	-.34021	-.35829	-.39725	1.00000

Appendix I.1B: First-Order Factor Exploratory Factor Analysis: Skill Items

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
AP1	.64722	*	1	24.77155	46.7	46.7
AP3	.63320	*	2	3.24545	6.1	52.9
AP4	.71074	*	3	2.15156	4.1	56.9
AP5	.67381	*	4	1.70676	3.2	60.1
AP6	.74774	*	5	1.51116	2.9	63.0
AP7	.69885	*	6	1.38009	2.6	65.6
AP8	.61280	*	7	1.22883	2.3	67.9
AP9	.62418	*	8	1.14029	2.2	70.1
AP10	.74216	*	9	1.02133	1.9	72.0
AP11	.75129	*				
AP12	.74783	*				
AP14	.74148	*				
IM1	.60515	*				
IM2	.68470	*				
IM3	.73996	*				
IM4	.67181	*				
IM6	.65864	*				
IM7	.69381	*				
IM8	.77406	*				
IM9	.65131	*				
IM10	.69212	*				
IM12	.74267	*				
PT1	.62370	*				
PT4	.66923	*				
PT5	.68298	*				
PT6	.66128	*				
PT7	.70684	*				
PT8	.61955	*				
RR1	.67323	*				
RR2	.84085	*				
RR3	.70789	*				
RR4	.74024	*				
RR5	.77822	*				
LS1	.60465	*				
LS2	.71230	*				
LS3	.80820	*				
LS4	.71361	*				
AT1	.80339	*				
AT2	.77625	*				
AT4	.77350	*				
AT5	.72700	*				
EX2	.80304	*				
EX5	.84389	*				
EX7	.76031	*				
EX8	.80814	*				
LI1	.77634	*				
LI2	.67580	*				
LI5	.82209	*				
LI7	.68187	*				
NV1	.81770	*				
NV2	.78572	*				
NV4	.80351	*				
NV6	.71016	*				

Appendix I.1B: First-Order Factor Exploratory Factor Analysis: Skill Items

ROTATED FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.70349	-.15885	.00592	.22681	.03642
AP3	.64886	.03837	.06691	-.13975	.09830
AP4	.63047	-.03057	.09280	-.25282	-.21650
AP5	.65107	.02461	.29887	.15786	.09603
AP6	.55009	-.16463	-.04654	-.00444	-.04098
AP7	.64222	.46106	.22983	-.08867	-.03146
AP8	.65103	-.04710	.22954	.00867	-.03567
AP9	.67127	-.18259	.29855	-.01621	.03305
AP10	.73825	.02724	.16538	-.13669	-.21876
AP11	.70698	-.15364	.03453	-.07749	-.06563
AP12	.81668	-.06105	.12053	.04262	.09794
AP14	.65552	.02355	.27611	-.02874	.05213
IM1	.60935	.09052	.02727	.01215	-.19288
IM2	.68275	-.00640	.07121	.16691	-.04182
IM3	.70781	.02050	.05788	-.13794	.08058
IM4	.77285	-.16471	.04005	-.15281	.02910
IM6	.75107	-.05102	-.02518	-.07571	-.10943
IM7	.78900	-.10316	-.11004	-.08194	.04496
IM8	.78607	.08215	-.09663	-.08920	.14109
IM9	.73789	-.08507	-.01051	-.13276	-.03397
IM10	.59529	.54064	.02243	-.03174	-.05687
IM12	.70545	.12560	-.00368	.02118	.33948
PT1	.54135	-.07818	.14511	-.18572	.42033
PT4	.52155	.10423	.61169	.06827	-.05661
PT5	.70004	.09845	.03077	.01010	.24952
PT6	.69823	-.04169	.26173	.01882	.00122
PT7	.70331	.07547	.32845	-.08636	.14874
PT8	.62520	.19266	.27389	-.08027	-.12429
RR1	.72035	-.01963	-.27256	.02523	.04459
RR2	.66509	.13699	-.11590	-.05169	-.07228
RR3	.71153	-.01234	-.05889	-.07261	-.08201
RR4	.77869	-.02753	.00181	-.18986	.05829
RR5	.75218	-.07541	.00988	-.11222	.01199
LS1	.68749	-.12683	-.29079	.02117	-.09931
LS2	.71842	-.19128	-.22657	.10820	-.22354
LS3	.75858	-.21690	-.03853	-.06273	-.19140
LS4	.63438	-.07270	-.31349	.08045	-.17936
AT1	.78831	-.02322	-.33034	.21501	-.01691
AT2	.77607	-.00339	-.29048	.08366	-.17748
AT4	.68147	.25678	-.26203	-.03516	.17967
AT5	.69550	.28237	-.27146	-.17748	.07003
EX2	.60893	.62265	.06508	.01123	-.00515
EX5	.65459	.60134	.02330	.05038	.15504
EX7	.50978	.64610	-.07705	.04327	-.09606
EX8	.58471	.55589	.00842	.07173	.32741
LI1	.72077	.05616	-.22873	.35407	.07715
LI2	.57874	-.13608	.00522	.52724	.02174
LI5	.46689	.07909	-.04909	.15944	.75060
LI7	.67131	.21502	.01874	.39598	-.03390
NV1	.55904	.32756	.05611	.54995	.25897
NV2	.65585	.39906	.05641	.36754	.01085
NV4	.62586	.43477	.21170	.33393	.04577
NV6	.66267	.26125	-.04775	.31433	.19464

Appendix I.1B: First-Order Factor Exploratory Factor Analysis: Skill Items

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9
AP1	.21087	.15801	-.02112	.06639
AP3	.11140	.39667	.08526	-.00264
AP4	.29417	.13466	.29555	-.02990
AP5	.14237	.31748	-.06766	.01409
AP6	-.01432	.04260	.63433	-.09888
AP7	.02362	.10756	.00371	.00452
AP8	.34612	.06031	.08388	.04719
AP9	-.06067	.21028	.01280	.04096
AP10	-.20982	.03515	-.11188	-.21153
AP11	-.12978	.00029	-.04585	.44431
AP12	-.01258	-.22341	.01712	-.02899
AP14	-.25807	-.11298	.17415	-.34894
IM1	.38821	.03668	-.17988	-.05603
IM2	.09594	-.06067	-.03133	.41228
IM3	.33715	.03362	.10084	.29104
IM4	.01713	-.13146	-.05649	-.02844
IM6	-.16965	-.19937	-.04766	-.05275
IM7	-.07859	-.15954	-.04864	-.07622
IM8	.00662	-.33405	-.01213	.02055
IM9	-.02388	-.18556	.12751	-.17157
IM10	.11415	-.02424	-.11150	-.12109
IM12	.29859	-.05485	.14036	-.04070
PT1	.27299	.06647	-.05835	-.09976
PT4	.06120	.02278	.00119	-.00728
PT5	.19663	.27013	.01380	-.08996
PT6	-.05238	-.22229	.19358	.11633
PT7	.02180	-.10426	.22612	.08102
PT8	.14163	-.26967	-.01215	-.04154
RR1	.12241	.03998	-.24162	.04546
RR2	.00425	.23424	-.46984	-.28769
RR3	-.02499	.38620	-.19005	.01008
RR4	-.12222	-.17280	-.13365	.17612
RR5	-.36444	-.05066	-.23370	.06265
LS1	.08806	-.07477	-.07560	.04461
LS2	-.05441	.13161	.01630	-.16134
LS3	-.25846	.17938	.04593	-.20635
LS4	-.37422	.06137	.15053	-.05004
AT1	-.12877	-.04747	.06693	-.04971
AT2	-.01750	-.04385	.17673	.13272
AT4	-.10257	.05090	.01592	.35725
AT5	-.15901	.03989	.15507	.05027
EX2	.03099	-.08269	-.02069	.17870
EX5	-.12363	.10347	-.02634	.00001
EX7	.12691	-.18515	-.06742	-.10496
EX8	-.12362	.15559	-.04782	-.05534
LI1	-.00059	-.05458	.15091	-.21045
LI2	-.02068	-.18450	-.09286	-.02794
LI5	-.07456	.00343	-.01637	.02804
LI7	-.07576	.12214	-.06134	-.04753
NV1	.06597	.05871	.10557	.07920
NV2	-.04386	.08489	.03678	.21785
NV4	-.11121	.21743	-.06829	.00692
NV6	.00653	.23871	.08129	-.01313

Appendix I.2A: First-Order Factor Exploratory Factor Analysis: Cognitive Items

:nal Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
AP1	.55579	*	1	17.44278	47.1	47.1
AP3	.51601	*	2	1.59386	4.3	51.5
AP4	.47297	*	3	1.11759	3.0	54.5
AP5	.58307	*	4	.89276	2.4	56.9
AP6	.49482	*	5	.80235	2.2	59.1
AP7	.57276	*				
AP8	.53228	*				
AP9	.53789	*				
AP10	.72321	*				
AP11	.51581	*				
AP12	.72146	*				
AP14	.59825	*				
IM1	.43203	*				
IM2	.50062	*				
IM3	.65117	*				
IM4	.63904	*				
IM6	.61894	*				
IM7	.64887	*				
IM8	.72399	*				
IM9	.59841	*				
IM10	.51436	*				
IM12	.59336	*				
PT1	.36938	*				
PT4	.49980	*				
PT5	.59456	*				
PT6	.60298	*				
PT7	.68032	*				
PT8	.49639	*				
RR1	.62982	*				
RR2	.74221	*				
RR3	.61238	*				
RR4	.67540	*				
RR5	.65986	*				
LS1	.53441	*				
LS2	.63897	*				
LS3	.83662	*				
LS4	.53115	*				

Appendix I.2A: First-Order Factor Exploratory Factor Analysis: Cognitive Items

Pattern Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.20756	-.02644	.30198	-.03637	.42566
AP3	-.04308	-.12010	.36079	.17256	.37936
AP4	.13875	-.06935	.09193	.17178	.42480
AP5	-.08367	-.04016	.42352	.32242	.30979
AP6	.17066	-.21984	-.22623	.03987	.54493
AP7	.15045	.01981	.32980	.47206	-.00671
AP8	.17541	.08634	.18899	.19359	.41152
AP9	.03867	-.19683	.10466	.16887	.48842
AP10	.11945	-.48863	.18289	.42970	-.05006
AP11	.54549	-.07860	.05562	-.00028	.16221
AP12	.59136	-.05826	.00459	.31288	.04512
AP14	.13246	-.34132	-.07166	.52745	.07517
IM1	.17830	.02348	.38838	.17628	.10795
IM2	.54306	.10330	.13764	.04386	.15280
IM3	.47604	.24574	.19961	.06739	.33240
IM4	.60793	-.12003	.03897	.05788	.12693
IM6	.58196	-.26670	-.04179	.09237	.03359
IM7	.61859	-.19627	.05583	.08232	.01035
IM8	.85062	.01145	-.03173	.08637	-.04553
IM9	.46411	-.25101	-.09022	.11459	.21509
IM10	.23188	.02450	.40273	.37166	-.17178
IM12	.42480	.20494	.19141	.15622	.27024
PT1	.18260	.11255	.20511	.14523	.29417
PT4	-.04948	.01625	.10053	.58874	.19719
PT5	.14537	.02695	.42693	.12127	.31129
PT6	.44203	-.03580	-.19525	.29113	.29450
PT7	.29002	.04654	-.08428	.50874	.27287
PT8	.32981	.01738	.08595	.44402	-.01353
RR1	.54607	-.06652	.39079	-.21190	.06328
RR2	.11446	-.32804	.69213	.03768	-.15237
RR3	.07833	-.27912	.50383	.02053	.18369
RR4	.73655	-.09175	.04212	.07894	-.04338
RR5	.53844	-.34031	.10198	.14518	-.14594
LS1	.49624	-.17885	.18906	-.22201	.17600
LS2	.23972	-.44303	.22959	-.14460	.25335
LS3	.00562	-.70253	.14195	.12837	.26645
LS4	.29203	-.51370	.03327	-.05303	.08145

Factor Correlation Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
FACTOR 1	1.00000				
FACTOR 2	-.45149	1.00000			
FACTOR 3	.49998	-.21937	1.00000		
FACTOR 4	.49829	-.16778	.35841	1.00000	
FACTOR 5	.56289	-.23220	.35335	.40796	1.00000

Appendix I.2B: First-Order Factor Exploratory Factor Analysis: Cognitive Items

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
AP1	.61288	*	1	17.83898	48.2	48.2
AP3	.58737	*	2	2.00123	5.4	53.6
AP4	.53072	*	3	1.49842	4.0	57.7
AP5	.63316	*	4	1.30143	3.5	61.2
AP6	.63376	*	5	1.19162	3.2	64.4
AP7	.63605	*				
AP8	.57675	*				
AP9	.60984	*				
AP10	.75136	*				
AP11	.55734	*				
AP12	.73645	*				
AP14	.68710	*				
IM1	.49688	*				
IM2	.57209	*				
IM3	.69370	*				
IM4	.66464	*				
IM6	.64908	*				
IM7	.66709	*				
IM8	.74483	*				
IM9	.63398	*				
IM10	.62180	*				
IM12	.63448	*				
PT1	.44411	*				
PT4	.60799	*				
PT5	.63452	*				
PT6	.65269	*				
PT7	.71043	*				
PT8	.58294	*				
RR1	.69172	*				
RR2	.77588	*				
RR3	.66771	*				
RR4	.70542	*				
RR5	.69560	*				
LS1	.59998	*				
LS2	.68540	*				
LS3	.82446	*				
LS4	.62149	*				

Appendix I.2B: First-Order Factor Exploratory Factor Analysis: Cognitive Items

Rotated Factor Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.70527	-.10749	-.16706	-.07906	.26413
AP3	.65859	.01229	.04454	.01891	.38876
AP4	.66017	-.05672	.08653	-.21435	.19556
AP5	.66833	-.06273	.17517	.14792	.36054
AP6	.55198	.09581	.02849	-.56184	.05853
AP7	.65835	-.05678	.30748	.31569	.07213
AP8	.68589	-.22472	.09291	-.08868	.19824
AP9	.68010	.06548	.07642	-.25491	.26871
AP10	.71901	.41078	.21105	.14450	-.01501
AP11	.71315	-.01100	-.14275	-.06928	-.15316
AP12	.82081	-.00583	.13204	.01795	-.21197
AP14	.64622	.30480	.40826	-.06436	-.07598
IM1	.61848	-.10270	.01525	.26316	.18529
IM2	.70093	-.22281	-.11169	.03571	-.13187
IM3	.74901	-.35920	-.05073	-.01906	.02688
IM4	.78649	.03996	-.08209	-.05829	-.18533
IM6	.73428	.21306	-.05087	-.07738	-.23652
IM7	.77363	.14643	-.07900	.00718	-.20210
IM8	.78756	-.04850	-.06467	.01389	-.34328
IM9	.73341	.17395	.00718	-.22208	-.12831
IM10	.59410	-.03424	.20042	.47697	-.00298
IM12	.73081	-.31375	.02571	.00489	.03571
PT1	.57808	-.25362	.03735	-.04266	.20591
PT4	.55009	-.09454	.52609	.03628	.13551
PT5	.72073	-.13379	-.03282	.11432	.28815
PT6	.71235	-.06330	.20808	-.26523	-.16615
PT7	.72801	-.14071	.37493	-.13177	-.05196
PT8	.64495	-.07118	.33129	.16288	-.16008
RR1	.71360	-.00529	-.38196	.19065	-.01522
RR2	.64017	.28740	-.17618	.45985	.20240
RR3	.69818	.19334	-.15864	.19237	.28408
RR4	.78087	.04315	-.08336	.04801	-.29078
RR5	.72580	.31218	-.03691	.12596	-.23266
LS1	.66935	.08308	-.37503	-.03492	-.05651
LS2	.68816	.35140	-.27024	-.06804	.10343
LS3	.72427	.52354	-.02837	-.10534	.11785
LS4	.57563	.49184	-.17692	-.10101	-.08204

Appendix I.3A: First-Order Factor Exploratory Factor Analysis: Behavioral Items

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
AT1	.81497	*	1	8.70012	54.4	54.4
AT2	.70573	*	2	1.06772	6.7	61.0
AT4	.61526	*	3	.72661	4.5	65.6
AT5	.65404	*				
EX2	.69143	*				
EX5	.85271	*				
EX7	.49585	*				
EX8	.71437	*				
LI1	.69673	*				
LI2	.43044	*				
LI5	.32211	*				
LI7	.60635	*				
NV1	.75069	*				
NV2	.70931	*				
NV4	.77817	*				
NV6	.65627	*				

Pattern Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3
AT1	-.06510	.94807	-.03340
AT2	-.00681	.84693	-.18061
AT4	.41382	.44215	-.22005
AT5	.36582	.48205	-.34857
EX2	.84306	-.01799	-.18163
EX5	.95659	-.04396	-.13535
EX7	.68003	.03720	-.14567
EX8	.85741	-.01202	-.05719
LI1	.07914	.74291	.16653
LI2	.02214	.57804	.21781
LI5	.33883	.23748	.15414
LI7	.48079	.28702	.25508
NV1	.59772	.16758	.40420
NV2	.64236	.21550	.17878
NV4	.87590	-.09659	.26450
NV6	.50620	.31266	.22427

Factor Correlation Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3
FACTOR 1	1.00000		
FACTOR 2	.66484	1.00000	
FACTOR 3	.10860	.12035	1.00000

Appendix I.3B: First-Order Factor Exploratory Factor Analysis: Behavioral Items

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
AT1	.82849	*	1	9.02181	56.4	56.4
AT2	.79521	*	2	1.36079	8.5	64.9
AT4	.67263	*	3	1.08349	6.8	71.7
AT5	.73789	*				
EX2	.74687	*				
EX5	.84162	*				
EX7	.63228	*				
EX8	.74905	*				
LI1	.74062	*				
LI2	.61064	*				
LI5	.44321	*				
LI7	.65303	*				
NV1	.78774	*				
NV2	.72950	*				
NV4	.80184	*				
NV6	.69546	*				

Rotated Factor Matrix:

	FACTOR 1	FACTOR 2	FACTOR 3
AT1	.68150	.52196	.30267
AT2	.61843	.62562	.14614
AT4	.70762	.39669	-.12057
AT5	.65340	.51987	-.20173
EX2	.76861	.07530	-.38785
EX5	.85835	.00613	-.32374
EX7	.67493	.11316	-.40490
EX8	.82459	-.05055	-.25796
LI1	.71736	.29096	.37597
LI2	.55753	.17218	.51976
LI5	.60676	-.11775	.24736
LI7	.78452	-.07715	.17778
NV1	.83000	-.23826	.20511
NV2	.85284	-.04036	.02324
NV4	.84807	-.27366	-.08798
NV6	.81742	-.03982	.16030

Appendix I.4A: First-Order Factor Exploratory Factor Analysis: Motivational Items

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
IN1	.45540	*	1	3.76570	41.8	41.8
IN2	.48707	*	2	.71958	8.0	49.8
IN3	.57365	*				
IN9	.61124	*				
IN12	.34741	*				
EM1	.46257	*				
EM2	.53986	*				
EM4	.46755	*				
EM8	.54052	*				

Pattern Matrix:

	FACTOR 1	FACTOR 2
IN1	.72056	-.07949
IN2	.71836	-.03429
IN3	.57868	.24931
IN9	.76592	.02555
IN12	.51892	.10547
EM1	.16816	.56406
EM2	-.03374	.75492
EM4	.14994	.58163
EM8	-.08170	.78237

Factor Correlation Matrix:

	FACTOR 1	FACTOR 2
FACTOR 1	1.00000	
FACTOR 2	.61215	1.00000

Appendix I.4B: First-Order Factor Exploratory Factor Analysis: Motivational Items

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
		*				
IN1	.61560	*	1	4.26149	47.3	47.3
IN2	.60346	*	2	1.21464	13.5	60.8
IN3	.62866	*				
IN9	.67432	*				
IN12	.46294	*				
EM1	.56369	*				
EM2	.66795	*				
EM4	.57785	*				
EM8	.68165	*				

Rotated Factor Matrix:

	FACTOR 1	FACTOR 2
IN1	.78315	.04781
IN2	.76744	.12040
IN3	.68671	.39634
IN9	.79208	.21663
IN12	.65110	.19748
EM1	.36603	.65553
EM2	.21897	.78740
EM4	.34341	.67817
EM8	.17655	.80652

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
AP1	.56802	*	1	26.71831	43.1	43.1
AP3	.57616	*	2	3.22040	5.2	48.3
AP4	.62390	*	3	2.25230	3.6	51.9
AP5	.69344	*	4	1.88528	3.0	55.0
AP6	.56069	*	5	1.51524	2.4	57.4
AP7	.65758	*	6	1.23446	2.0	59.4
AP8	.55515	*	7	1.13889	1.8	61.2
AP9	.63575	*	8	.98556	1.6	62.8
AP10	.70853	*	9	.93919	1.5	64.3
AP11	.70268	*	10	.77149	1.2	65.6
AP12	.74746	*	11	.75527	1.2	66.8
AP14	.84125	*				
IM1	.46234	*				
IM2	.58086	*				
IM3	.71583	*				
IM4	.66051	*				
IM6	.70280	*				
IM7	.66508	*				
IM8	.73459	*				
IM9	.60684	*				
IM10	.59296	*				
IM12	.72787	*				
PT1	.44734	*				
PT4	.55494	*				
PT5	.65071	*				
PT6	.61211	*				
PT7	.64906	*				
PT8	.60883	*				
RR1	.67160	*				
RR2	.75927	*				
RR3	.64423	*				
RR4	.70509	*				
RR5	.75004	*				
LS1	.56896	*				
LS2	.67233	*				
LS3	.78251	*				
LS4	.61745	*				
AT1	.81210	*				
AT2	.73325	*				
AT4	.73328	*				
AT5	.67045	*				
EX2	.79651	*				
EX5	.88370	*				
EX7	.69037	*				

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
EX8	.77134	*				
LI1	.73584	*				
LI2	.52373	*				
LI5	.74432	*				
LI7	.74516	*				
NV1	.80065	*				
NV2	.74966	*				
NV4	.91255	*				
NV6	.71907	*				
IN1	.51974	*				
IN2	.58660	*				
IN3	.65729	*				
IN9	.67593	*				
IN12	.55751	*				
EM1	.52559	*				
EM2	.64916	*				
EM4	.60100	*				
EM8	.70682	*				

PATTERN MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.12549	-.08347	.12974	.14534	-.08262
AP3	.01649	.06818	-.03094	.15447	-.21265
AP4	.09871	.11240	.12974	.24079	.17252
AP5	.04756	-.02010	.18432	.34052	-.23235
AP6	-.02935	-.09687	-.02033	.02059	-.00798
AP7	-.00439	.54175	.13151	.19904	-.03455
AP8	.11959	.04031	.09476	.38131	.01063
AP9	-.15603	-.08917	.01676	.29693	-.00832
AP10	.04703	.15325	-.10150	.11636	.16243
AP11	.12487	-.01194	.15003	.12595	-.04947
AP12	.21688	.00636	.02772	.17574	-.14994
AP14	-.06769	.06895	.07074	.09655	-.09745
IM1	.24883	.18111	.06882	.20360	.12340
IM2	.29411	.06548	.02091	.21880	-.09566
IM3	.38235	.10651	.07046	.30658	-.19119
IM4	.34604	-.05425	.05237	.13669	-.04101

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
IM6	.06803	.14431	-.02948	-.01269	.16001
IM7	.25877	.05304	.09231	-.07069	-.06559
IM8	.36838	.23082	-.05466	.01959	-.10993
IM9	.16992	.08656	-.02508	.02368	.04710
IM10	.06514	.61342	.04810	.08803	.02833
IM12	.28879	.13695	.03662	.16907	-.33920
PT1	.12760	-.03072	.02234	.26155	-.29357
PT4	-.12413	.15598	.13861	.50990	.01870
PT5	.08147	.08860	.07760	.14190	-.27421
PT6	.04977	.08345	.03957	.26230	-.00211
PT7	.04965	.16510	.10497	.32944	-.17807
PT8	.27435	.28418	-.18639	.37215	.06607
RR1	.41249	.02760	-.06263	-.05303	-.10355
RR2	.15386	.22850	.14233	-.10823	.08569
RR3	.05341	.06838	.19491	-.00835	-.00748
RR4	.30846	.12108	.06606	.06423	-.11335
RR5	.03025	.05192	.07690	-.05880	-.07472
LS1	.42315	-.00052	.11281	-.11206	.05112
LS2	.16910	-.08226	.11883	-.17066	.14434
LS3	.03356	-.12686	-.06105	-.08270	.10389
LS4	.01207	.02407	-.06512	-.33115	.04296
AT1	.20598	.05517	.17231	-.32115	-.08205
AT2	.23231	.14996	.10439	-.17209	.04851
AT4	.18399	.35575	-.05099	-.14910	-.33342
AT5	.08594	.41853	.01868	-.23756	-.14558
EX2	.10700	.76718	-.12788	.13970	-.06324
EX5	-.14078	.70475	-.13004	-.01514	-.22530
EX7	.12922	.79148	.06498	-.02765	.13027
EX8	-.14952	.57100	.03361	-.06493	-.38712
LI1	.16011	.10150	.00900	-.20173	-.13884
LI2	.15734	-.09893	-.01577	.03247	-.06269
LI5	.01873	-.05372	-.04111	-.02627	-.76342
LI7	-.15749	.24933	-.03277	.02118	.01700
NV1	-.06362	.26858	.12888	.06593	-.35517
NV2	.01483	.45072	.13955	.05443	-.12218
NV4	-.25255	.46062	.19957	.12912	-.07054
NV6	-.01443	.24350	.21409	-.05339	-.30815
IN1	-.00118	.08573	.06976	-.07669	-.18744
IN2	.07030	-.05618	.11979	-.05203	-.11891
IN3	.02719	.11669	.26820	.22396	-.16431
IN9	-.11107	.17907	.19006	-.05579	-.07752
IN12	.18446	.25373	.17031	-.18246	-.10827
EM1	.11838	.04662	.42664	-.07178	-.18996
EM2	.17522	.15900	.57592	.00780	.05686
EM4	-.07414	-.06014	.70792	.05893	-.00431
EM8	-.02498	-.07261	.88354	-.00811	.04575

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10
AP1	.04012	-.04573	-.23482	-.17281	-.29850
AP3	-.05092	.06153	-.45908	-.25343	.01894
AP4	.12680	.06079	-.19480	-.46406	.14515
AP5	-.23265	.18263	-.33266	-.03206	-.23197
AP6	.17694	.20921	.01180	-.56840	-.10833
AP7	-.00670	.18228	-.13137	-.00432	.04998
AP8	.05691	-.01666	-.14980	-.24852	-.11546
AP9	.24977	-.00265	-.31796	-.10925	-.12519
AP10	.07135	.39923	-.36695	.03587	-.07687
AP11	-.07013	-.04133	.01071	-.08493	-.07834
AP12	.19212	.31714	.04306	-.02659	-.14321
AP14	.02389	.84457	.02286	-.06994	-.00410
IM1	.05967	-.05971	-.26434	-.07647	-.11779
IM2	.02227	-.08585	.00668	-.03915	-.30617
IM3	-.09899	-.07264	-.09954	-.28876	.03432
IM4	.07672	.28521	-.12761	-.01235	-.01833
IM6	.35772	.15283	-.05268	-.04337	-.06841
IM7	.02524	.29766	-.08024	-.12714	-.00639
IM8	.25318	.18081	.07725	-.02082	-.01318
IM9	.17937	.28732	-.07431	-.27771	.01297
IM10	.02121	.09933	-.10172	.00073	-.02177
IM12	.25277	.06381	-.04005	-.21550	-.02783
PT1	.14978	.03308	-.22720	-.11864	.13241
PT4	-.03048	.18601	-.05728	-.01526	-.11344
PT5	.18481	.03329	-.36525	-.09447	-.05628
PT6	.22684	.16938	.14992	-.15438	-.12253
PT7	.09002	.20852	.06886	-.21130	.04090
PT8	.06134	.26114	.00435	-.03528	-.09858
RR1	.15394	-.07730	-.33336	.07327	-.20363
RR2	.04573	.13969	-.59976	.19238	-.03701
RR3	-.03425	.01199	-.50627	-.07899	-.04665
RR4	-.01975	.22763	-.02357	.02749	.05624
RR5	.00429	.28853	-.13093	.13001	-.02192
LS1	.03831	.06556	-.14781	-.12056	-.15836
LS2	-.00583	.20580	-.29046	-.24508	-.27376
LS3	.09387	.36246	-.47252	-.16868	-.16019
LS4	.10248	.21293	-.17814	-.17684	-.23420
AT1	.08244	.19497	-.04207	-.17627	-.29457
AT2	.00984	.04129	-.02843	-.33410	-.19726
AT4	-.11113	-.11081	-.07171	-.14574	-.04039
AT5	.05605	.11914	-.10503	-.24925	.12657
EX2	-.00774	-.01242	.04320	-.00073	-.08828
EX5	.13238	.03919	-.18572	.01623	-.06676
EX7	.10891	.02166	.08947	-.03207	-.04557
EX8	.00442	.13026	-.14494	.04016	-.01513
LI1	.07923	.21755	-.07848	-.27483	-.42057
LI2	.10039	.16746	.04269	.01481	-.56564
LI5	.21532	.05938	-.00372	.10647	-.08997

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10
LI7	.28440	-.07114	-.18312	.02236	-.52997
NV1	-.04920	.02252	.12197	-.11736	-.54713
NV2	-.09229	-.04761	.02455	-.06062	-.43565
NV4	.01170	.05272	-.13613	.10666	-.39430
NV6	-.16496	.11898	-.14481	-.19774	-.30767
IN1	.31787	-.03050	-.20677	-.07632	.00011
IN2	.62580	.13308	.12126	-.04648	-.07550
IN3	.48454	-.21370	-.05466	.02094	-.10687
IN9	.53801	.00583	-.09692	-.21368	-.03656
IN12	.09391	-.12111	-.15765	-.28382	-.13594
EM1	.23368	.03980	-.19551	.23608	.07149
EM2	.09688	.09005	-.13382	.31413	-.07806
EM4	.14304	.00983	.02425	-.15411	.06253
EM8	-.05607	-.00816	.07466	-.01655	-.02080

	FACTOR 11
AP1	.14875
AP3	.03446
AP4	.04566
AP5	-.02847
AP6	.01981
AP7	.04475
AP8	.09223
AP9	.33155
AP10	.16824
AP11	.67706
AP12	.24112
AP14	-.03523
IM1	.01977
IM2	.25674
IM3	.13258
IM4	.23909
IM6	.43834
IM7	.28939
IM8	.23994
IM9	.16254
IM10	.01015
IM12	-.13140
PT1	.03211
PT4	.11271
PT5	-.04922
PT6	.31846
PT7	.17922
PT8	-.00748
RR1	.15184
RR2	.02285
RR3	.21491
RR4	.43705
RR5	.61116
LS1	.13402
LS2	.12098
LS3	.15716
LS4	.28458

Appendix I.5A: First-Order Factor Exploratory Factor Analysis: All Items

FACTOR 11

AT4	.36979
AT5	.23146
EX2	.10186
EX5	.08285
EX7	-.06858
EX8	.04465
LI1	-.11223
LI2	.04554
LI5	.08084
LI7	.15496
NV1	-.10386
NV2	.08820
NV4	.08733
NV6	-.06957
IN1	.24326
IN2	-.01709
IN3	-.09518
IN9	-.03104
IN12	-.05495
EM1	-.06321
EM2	-.19080
EM4	.05228
EM8	.10383

FACTOR CORRELATION MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
FACTOR 1	1.00000				
FACTOR 2	.28025	1.00000			
FACTOR 3	.19414	.24947	1.00000		
FACTOR 4	.10624	.18433	.15705	1.00000	
FACTOR 5	-.17016	-.34627	-.22723	-.13751	1.00000
FACTOR 6	.24724	.25404	.31370	.10863	-.25404
FACTOR 7	.29458	.28621	.16209	.15698	-.13315
FACTOR 8	-.31546	-.36119	-.31928	-.14688	.20978
FACTOR 9	-.27621	-.18917	-.13210	-.16136	.18621
FACTOR 10	-.26227	-.38745	-.26842	-.09233	.29239
FACTOR 11	.37686	.26919	.12194	.13144	-.17350

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10
FACTOR 6	1.00000				
FACTOR 7	.29420	1.00000			
FACTOR 8	-.28037	-.33234	1.00000		
FACTOR 9	-.23693	-.28308	.25829	1.00000	
FACTOR 10	-.24594	-.31676	.31177	.27840	1.00000
FACTOR 11	.24727	.41226	-.36762	-.38296	-.33487

	FACTOR 11
FACTOR 11	1.00000

Appendix I.5B: First-Order Factor Exploratory Factor Analysis: All Items

FINAL STATISTICS:

VARIABLE	COMMUNALITY	*	FACTOR	EIGENVALUE	PCT OF VAR	CUM PCT
		*				
AP1	.63786	*	1	27.03896	43.6	43.6
AP3	.66172	*	2	3.51326	5.7	49.3
AP4	.70647	*	3	2.57860	4.2	53.4
AP5	.73998	*	4	2.24165	3.6	57.1
AP6	.69409	*	5	1.83518	3.0	60.0
AP7	.69904	*	6	1.55948	2.5	62.5
AP8	.62659	*	7	1.45583	2.3	64.9
AP9	.68279	*	8	1.31110	2.1	67.0
AP10	.75435	*	9	1.28141	2.1	69.1
AP11	.78851	*	10	1.11307	1.8	70.9
AP12	.75923	*	11	1.06899	1.7	72.6
AP14	.82776	*				
IM1	.58542	*				
IM2	.65300	*				
IM3	.75164	*				
IM4	.69357	*				
IM6	.72951	*				
IM7	.69718	*				
IM8	.76859	*				
IM9	.65829	*				
IM10	.65579	*				
IM12	.75756	*				
PT1	.57322	*				
PT4	.66561	*				
PT5	.68976	*				
PT6	.66139	*				
PT7	.69303	*				
PT8	.68837	*				
RR1	.72245	*				
RR2	.79108	*				
RR3	.69015	*				
RR4	.74717	*				
RR5	.78025	*				
LS1	.64106	*				
LS2	.71708	*				
LS3	.80511	*				
LS4	.68982	*				
AT1	.80987	*				
AT2	.75475	*				
AT4	.76995	*				
AT5	.71123	*				
EX2	.81498	*				
EX5	.87364	*				
EX7	.76248	*				
EX8	.79649	*				
LI1	.76290	*				
LI2	.70713	*				
LI5	.80316	*				
LI7	.77715	*				
NV1	.82112	*				
NV2	.77467	*				
NV4	.81625	*				
NV6	.77498	*				
IN1	.64777	*				
IN2	.71595	*				
IN3	.72904	*				
IN9	.72832	*				
IN12	.64453	*				
EM1	.66595	*				
EM2	.74490	*				
EM4	.71589	*				
EM8	.78991	*				

Appendix I.5B: First-Order Factor Exploratory Factor Analysis: All Items

ROTATED FACTOR MATRIX:

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
AP1	.70434	-.12969	.10153	.10282	-.01677
AP3	.66430	-.01017	-.06328	.10205	-.09546
AP4	.62926	-.05587	.11233	.07356	.07211
AP5	.65175	.02335	.16111	.29419	-.23682
AP6	.55189	-.18025	-.00616	-.07130	.16102
AP7	.64724	.44159	.09239	.17027	-.04116
AP8	.65136	-.02685	.07966	.26546	.01460
AP9	.66742	-.15309	.01269	.38211	.14163
AP10	.72340	.00932	-.14845	.17168	-.05629
AP11	.70512	-.14004	.07418	.14268	-.21291
AP12	.81088	-.07548	-.01934	.12628	.09561
AP14	.63771	.00849	.01722	.16365	.00520
IM1	.60860	.07434	.00876	.06311	.01579
IM2	.69019	-.00094	-.01295	.08022	-.07146
IM3	.72062	-.01226	.03452	.02075	-.16185
IM4	.76223	-.19181	-.00685	.02293	-.05800
IM6	.73853	-.04138	-.07782	.03488	.19351
IM7	.77953	-.11446	.01259	-.13227	-.09579
IM8	.78337	.05575	-.10694	-.13516	.11645
IM9	.73125	-.09557	-.07533	-.08779	.07818
IM10	.59800	.51821	.00748	.05457	-.00313
IM12	.71851	.08637	.04489	-.06901	.22694
PT1	.54809	-.10930	-.00117	.14533	.10654
PT4	.51176	.15579	.13716	.56676	-.07187
PT5	.71219	.05906	.07443	.06616	.15587
PT6	.69157	-.01734	.01164	.22266	.13805
PT7	.70422	.08124	.08353	.23135	.02751
PT8	.61946	.17078	-.23457	.20606	.00325
RR1	.72798	-.07733	-.10792	-.16587	.04454
RR2	.65927	.10999	.08489	-.06427	-.04169
RR3	.71335	-.03832	.14945	.02424	-.12931
RR4	.77402	-.05525	-.02171	-.01459	-.16725
RR5	.74045	-.08296	-.01404	.08928	-.15052
LS1	.68470	-.15551	.05413	-.29084	-.06843
LS2	.70903	-.19360	.06978	-.19389	-.08943
LS3	.74916	-.24253	-.09345	-.01567	-.02531
LS4	.63414	-.09801	-.11451	-.21175	.01306
AT1	.78932	-.04043	.10069	-.29305	.02099
AT2	.77947	-.02144	.03283	-.23731	-.07145
AT4	.70206	.21475	-.11225	-.22118	-.18888
AT5	.70969	.22743	-.04034	-.25981	-.01582
EX2	.62346	.60860	-.15831	.04387	-.04516
EX5	.67294	.57913	-.12060	.03193	.08592
EX7	.51491	.64848	.02851	-.13694	.09683
EX8	.60151	.52754	.01639	.00617	.00595
LI1	.72627	.06577	-.00980	-.27018	.06827
LI2	.56827	-.08710	-.04968	.01478	.07467
LI5	.48553	.04921	-.01414	-.01982	.19774
LI7	.67401	.25707	-.01132	.12175	.21605
NV1	.57285	.37242	.14448	.01690	.01279
NV2	.66672	.43372	.12098	-.00571	-.10627
NV4	.62850	.48011	.19450	.22029	-.00113
NV6	.67386	.26514	.20174	-.09652	-.14080
IN1	.64139	.00565	.04862	.00433	.28083
IN2	.47585	-.07676	.13719	-.06676	.64544
IN3	.46420	.16239	.31592	.14731	.49958
IN9	.59425	.13258	.21829	-.05735	.51941
IN12	.61513	.17560	.16376	-.36988	.07557
EM1	.38210	.04920	.44201	-.08771	.22023
EM2	.33314	.18484	.55900	-.02219	.10709
EM4	.36863	-.04694	.73068	.06565	.16520
EM8	.28112	-.02598	.83855	.01958	-.02438

Appendix I.5B: First-Order Factor Exploratory Factor Analysis: All Items

	FACTOR 6	FACTOR 7	FACTOR 8	FACTOR 9	FACTOR 10
AP1	-.00281	.00943	-.02273	.17162	.15268
AP3	.08299	.09768	-.01239	-.15506	.39364
AP4	-.32326	.19695	-.22959	-.25498	.15016
AP5	.12474	.15919	.10063	.16299	.25620
AP6	-.08288	.00497	-.51602	.01901	.14642
AP7	-.02092	.07881	.09418	-.12716	.02727
AP8	-.15868	.21946	-.14231	.02163	.09821
AP9	-.01142	-.11012	-.03835	-.06633	.13331
AP10	-.20382	-.15582	.18072	-.06348	.04166
AP11	.03812	-.14362	-.14027	-.10273	-.28263
AP12	.08274	.04141	-.00960	.07214	-.20821
AP14	.04441	-.04870	-.04996	.04264	-.04835
IM1	-.29753	.18912	.18801	.03330	.11183
IM2	.03225	.13694	-.00582	.20693	-.18155
IM3	.02051	.39441	-.11570	-.08430	-.01449
IM4	-.04186	.09463	.10481	-.05241	-.17078
IM6	-.14881	-.23315	-.00291	-.09591	-.22618
IM7	.00115	-.03892	.00521	-.06075	-.14232
IM8	.04388	.12052	.05751	-.02871	-.28506
IM9	-.13565	.03727	-.12961	-.09209	-.04979
IM10	-.10590	.02366	.09985	-.06541	.00095
IM12	.18991	.36593	-.03856	.02795	.05394
PT1	.22375	.33599	.05197	-.18838	.16489
PT4	-.05977	.11870	-.06427	.04889	.00807
PT5	.17074	.13829	.12973	-.04760	.27599
PT6	-.03076	.04211	-.21030	.04162	-.25056
PT7	.09905	.22014	-.19882	-.07895	-.10124
PT8	-.19917	.28760	.02958	.08814	-.15042
RR1	.01602	.00902	.30009	.05867	.00600
RR2	-.12888	-.14930	.48530	-.08537	.21550
RR3	-.05633	-.14627	.17857	-.12990	.23771
RR4	.06453	.03232	.07418	-.12378	-.29359
RR5	.09464	-.31837	.09202	-.12251	-.23185
LS1	-.14386	.04539	.11646	.09644	-.08560
LS2	-.20985	-.21129	-.01986	.11637	.13496
LS3	-.15261	-.25404	.06237	-.00695	.18568
LS4	-.03484	-.45472	-.08141	.04675	.01205
AT1	.04207	-.23736	-.03408	.16067	-.05904
AT2	-.11099	-.13828	-.17225	.05051	-.08497
AT4	.26631	-.02333	-.05889	-.07317	-.07278
AT5	.09014	-.12389	-.09818	-.22880	-.01759
EX2	.01908	.09466	.01905	.00415	-.10566
EX5	.19336	-.08411	.07440	-.05079	.09893
EX7	-.17293	.06668	.05808	-.00344	-.09855
EX8	.34979	-.06427	.07868	-.04579	.12593
LI1	.05882	-.07012	-.10150	.32011	.14647
LI2	.02846	-.05637	.03700	.59650	-.07668
LI5	.71247	.08743	.04644	.08576	.02122
LI7	.01129	-.28716	.02972	.27258	.11952
NV1	.30346	.04903	-.15122	.44584	.11929
NV2	.10367	-.00763	-.04498	.30466	.02491
NV4	.10363	-.16019	.07444	.21385	.12899
NV6	.23956	.01010	-.07735	.22807	.24714
IN1	.18542	-.20621	.03177	-.19592	.04269
IN2	.10611	-.01786	-.00366	.07389	-.13718
IN3	.12890	.19154	.11147	.05439	.06812
IN9	.05131	-.05628	-.07405	-.05939	.14630
IN12	.01612	.07086	-.04938	.04156	.19247
EM1	.21532	.05798	.45382	-.06924	.03563
EM2	-.06155	.07722	.49113	.12679	.00871
EM4	-.01254	.02309	-.07575	-.07022	.03041
EM8	-.02542	-.03117	.03299	.02974	-.03614

Appendix I.5B: First-Order Factor Exploratory Factor Analysis: All Items

	FACTOR 11
AP1	-.22452
AP3	-.03490
AP4	.02448
AP5	.05318
AP6	.17607
AP7	.11606
AP8	-.14441
AP9	-.10853
AP10	.26839
AP11	-.26140
AP12	.11553
AP14	.61880
IM1	-.17873
IM2	-.26330
IM3	-.16641
IM4	.13510
IM6	.02788
IM7	.15524
IM8	.08184
IM9	.21767
IM10	.02389
IM12	.02046
PT1	-.00819
PT4	.10000
PT5	-.03599
PT6	.05091
PT7	.12235
PT8	.15597
RR1	-.22693
RR2	.05598
RR3	-.10160
RR4	.06431
RR5	.08202
LS1	-.05396
LS2	.07472
LS3	.22178
LS4	.05495
AT1	.01374
AT2	-.11551
AT4	-.21945
AT5	.02624
EX2	-.07731
EX5	-.00928
EX7	.02073
EX8	.07358
LI1	.10370
LI2	.03603
LI5	-.00901
LI7	-.15193
NV1	-.05078
NV2	-.09904
NV4	-.00792
NV6	.06468
IN1	-.19235
IN2	.08878
IN3	-.20681
IN9	.02583
IN12	-.13958
EM1	.06497
EM2	.09051
EM4	-.00401
EM8	-.03410

Appendix J

First-Order Factor Confirmatory Factor Analysis

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	1	10	12	15	19	22	25	30	33
1	0.47								
10	0.51	0.43							
12	0.46	0.48	0.42						
15	0.48	0.54	0.42	0.44					
19	0.37	0.37	0.45	0.25	0.29				
22	0.41	0.48	0.44	0.53	0.26	0.43			
25	0.56	0.54	0.50	0.52	0.42	0.36	0.44		
30	0.56	0.49	0.47	0.50	0.38	0.40	0.51	0.46	
33	0.38	0.45	0.47	0.49	0.37	0.46	0.42	0.51	0.55
38	0.56	0.45	0.43	0.44	0.34	0.44	0.46	0.49	0.46
41	0.58	0.45	0.47	0.52	0.44	0.53	0.52	0.46	0.63
56	0.43	0.44	0.40	0.49	0.43	0.55	0.34	0.42	0.58
6	0.43	0.50	0.48	0.46	0.20	0.49	0.46	0.39	0.46
18	0.52	0.40	0.41	0.47	0.36	0.45	0.45	0.39	0.46
21	0.50	0.49	0.56	0.57	0.41	0.53	0.60	0.44	0.42
26	0.45	0.45	0.51	0.46	0.44	0.45	0.56	0.48	0.57
34	0.48	0.36	0.49	0.30	0.39	0.44	0.49	0.56	0.60
40	0.51	0.45	0.46	0.42	0.39	0.42	0.46	0.45	0.55
45	0.46	0.42	0.47	0.37	0.41	0.50	0.43	0.47	0.54
48	0.46	0.47	0.52	0.37	0.47	0.37	0.46	0.51	0.55
51	0.34	0.38	0.33	0.43	0.22	0.59	0.52	0.27	0.50
55	0.49	0.44	0.53	0.52	0.41	0.43	0.51	0.45	0.42
9	0.46	0.40	0.39	0.42	0.31	0.35	0.36	0.48	0.33
20	0.43	0.34	0.37	0.51	0.27	0.44	0.48	0.45	0.49
35	0.42	0.38	0.44	0.44	0.46	0.53	0.51	0.62	0.41
43	0.46	0.48	0.52	0.53	0.39	0.54	0.51	0.54	0.56
46	0.35	0.42	0.40	0.40	0.34	0.50	0.45	0.34	0.55
23	0.55	0.55	0.46	0.59	0.40	0.63	0.50	0.48	0.43
2	0.54	0.48	0.35	0.44	0.33	0.37	0.40	0.42	0.48
8	0.50	0.45	0.35	0.47	0.10	0.49	0.37	0.40	0.59
11	0.51	0.53	0.46	0.49	0.32	0.48	0.44	0.54	0.55
27	0.45	0.45	0.43	0.46	0.37	0.48	0.45	0.47	0.55
39	0.42	0.43	0.37	0.42	0.32	0.41	0.40	0.45	0.63
3	0.50	0.34	0.37	0.36	0.38	0.32	0.38	0.44	0.49
16	0.52	0.40	0.42	0.46	0.49	0.39	0.36	0.42	0.51
32	0.43	0.53	0.49	0.47	0.52	0.40	0.43	0.56	0.76
36	0.39	0.33	0.34	0.33	0.45	0.26	0.25	0.34	0.52

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	38	41	56	6	18	21	26	34	40
38	0.48								
41	0.61	0.66							
56	0.39	0.63	0.43						
6	0.34	0.50	0.25	0.37					
18	0.59	0.58	0.35	0.41	0.45				
21	0.55	0.55	0.31	0.44	0.55	0.51			
26	0.55	0.66	0.55	0.38	0.50	0.64	0.60		
34	0.55	0.63	0.46	0.42	0.44	0.42	0.57	0.53	
40	0.55	0.69	0.53	0.47	0.49	0.54	0.62	0.65	0.59
45	0.53	0.71	0.46	0.47	0.54	0.53	0.67	0.67	0.69
48	0.46	0.54	0.58	0.45	0.40	0.46	0.58	0.62	0.66
51	0.34	0.51	0.41	0.42	0.37	0.43	0.38	0.42	0.42
55	0.38	0.61	0.47	0.41	0.53	0.67	0.52	0.46	0.54
9	0.31	0.46	0.33	0.37	0.37	0.42	0.38	0.34	0.42
20	0.36	0.47	0.43	0.33	0.41	0.41	0.36	0.33	0.31
35	0.54	0.61	0.52	0.40	0.47	0.48	0.59	0.58	0.51
43	0.48	0.65	0.53	0.45	0.51	0.56	0.51	0.48	0.58
46	0.40	0.56	0.52	0.44	0.46	0.52	0.49	0.38	0.39
23	0.45	0.54	0.44	0.50	0.47	0.55	0.49	0.43	0.46
2	0.47	0.58	0.30	0.48	0.56	0.47	0.61	0.49	0.50
8	0.38	0.41	0.39	0.48	0.33	0.36	0.51	0.49	0.55
11	0.47	0.51	0.37	0.46	0.47	0.49	0.50	0.46	0.56
27	0.60	0.62	0.52	0.41	0.58	0.59	0.67	0.61	0.67
39	0.65	0.61	0.52	0.37	0.48	0.46	0.61	0.66	0.68
3	0.50	0.46	0.38	0.32	0.48	0.50	0.57	0.53	0.43
16	0.55	0.50	0.48	0.38	0.40	0.44	0.56	0.51	0.57
32	0.45	0.59	0.54	0.39	0.42	0.41	0.59	0.59	0.58
36	0.46	0.49	0.43	0.28	0.41	0.29	0.44	0.52	0.54

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	45	48	51	55	9	20	35	43	46
45	0.59								
48	0.65	0.53							
51	0.49	0.30	0.35						
55	0.62	0.52	0.50	0.50					
9	0.42	0.42	0.32	0.51	0.31				
20	0.31	0.35	0.42	0.40	0.42	0.30			
35	0.63	0.55	0.32	0.44	0.37	0.41	0.48		
43	0.56	0.52	0.40	0.60	0.44	0.57	0.66	0.52	
46	0.51	0.46	0.49	0.47	0.31	0.50	0.52	0.50	0.41
23	0.52	0.46	0.47	0.62	0.50	0.31	0.47	0.49	0.40
2	0.57	0.48	0.44	0.52	0.37	0.23	0.43	0.38	0.45
8	0.46	0.44	0.48	0.41	0.38	0.30	0.28	0.31	0.39
11	0.45	0.42	0.45	0.48	0.39	0.36	0.38	0.40	0.37
27	0.65	0.65	0.40	0.47	0.44	0.36	0.51	0.54	0.52
39	0.57	0.56	0.43	0.40	0.33	0.39	0.46	0.44	0.42
3	0.56	0.50	0.32	0.43	0.35	0.23	0.42	0.35	0.39
16	0.47	0.56	0.39	0.39	0.27	0.24	0.46	0.35	0.32
32	0.54	0.56	0.34	0.37	0.30	0.33	0.50	0.46	0.43
36	0.44	0.50	0.31	0.31	0.17	0.16	0.35	0.35	0.27

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	23	2	8	11	27	39	3	16	32
23	0.50								
2	0.53	0.48							
8	0.54	0.55	0.42						
11	0.51	0.56	0.63	0.49					
27	0.48	0.55	0.49	0.51	0.59				
39	0.44	0.51	0.54	0.57	0.72	0.53			
3	0.39	0.60	0.52	0.48	0.57	0.42	0.42		
16	0.51	0.54	0.54	0.57	0.53	0.54	0.63	0.48	
32	0.47	0.51	0.56	0.63	0.53	0.62	0.56	0.68	0.55
36	0.33	0.50	0.43	0.42	0.44	0.55	0.40	0.55	0.66

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	36
36	0.33

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	1	10	12	15	19	22	25	30	33
1	0.47								
10	0.45	0.43							
12	0.45	0.42	0.42						
15	0.46	0.44	0.43	0.44					
19	0.37	0.35	0.35	0.36	0.29				
22	0.45	0.43	0.43	0.44	0.35	0.43			
25	0.46	0.44	0.43	0.44	0.36	0.44	0.44		
30	0.46	0.44	0.44	0.45	0.36	0.44	0.45	0.46	
33	0.51	0.49	0.48	0.49	0.40	0.49	0.49	0.50	0.55
38	0.48	0.45	0.45	0.46	0.37	0.45	0.46	0.47	0.51
41	0.56	0.53	0.53	0.54	0.44	0.54	0.54	0.55	0.60
56	0.45	0.43	0.43	0.44	0.35	0.43	0.44	0.45	0.49
6	0.42	0.40	0.39	0.40	0.32	0.40	0.40	0.41	0.45
18	0.46	0.44	0.43	0.45	0.36	0.44	0.45	0.45	0.50
21	0.49	0.47	0.46	0.48	0.38	0.47	0.48	0.48	0.53
26	0.53	0.51	0.50	0.52	0.41	0.51	0.52	0.52	0.57
34	0.50	0.48	0.47	0.49	0.39	0.48	0.49	0.49	0.54
40	0.53	0.50	0.50	0.51	0.41	0.50	0.51	0.52	0.57
45	0.53	0.50	0.50	0.51	0.41	0.50	0.51	0.52	0.57
48	0.50	0.48	0.47	0.49	0.39	0.48	0.49	0.49	0.54
51	0.41	0.39	0.38	0.39	0.32	0.39	0.39	0.40	0.44
55	0.48	0.46	0.46	0.47	0.38	0.46	0.47	0.48	0.52
9	0.38	0.36	0.36	0.37	0.30	0.36	0.37	0.37	0.41
20	0.38	0.36	0.35	0.37	0.29	0.36	0.37	0.37	0.41
35	0.48	0.46	0.45	0.46	0.37	0.46	0.46	0.47	0.52
43	0.49	0.47	0.46	0.48	0.38	0.47	0.48	0.48	0.53
46	0.44	0.42	0.41	0.42	0.34	0.42	0.42	0.43	0.47
23	0.49	0.47	0.46	0.47	0.38	0.47	0.47	0.48	0.53
2	0.48	0.45	0.45	0.46	0.37	0.46	0.46	0.47	0.51
8	0.44	0.42	0.42	0.43	0.35	0.42	0.43	0.44	0.48
11	0.48	0.46	0.45	0.47	0.38	0.46	0.47	0.47	0.52
27	0.53	0.50	0.50	0.51	0.41	0.50	0.51	0.52	0.57
39	0.50	0.48	0.47	0.48	0.39	0.48	0.49	0.49	0.54
3	0.45	0.42	0.42	0.43	0.35	0.43	0.43	0.44	0.48
16	0 17	0.45	0.45	0.46	0.37	0.45	0.46	0.47	0.51
32	0.51	0.49	0.48	0.50	0.40	0.49	0.50	0.50	0.55
36	0.40	0.38	0.37	0.39	0.31	0.38	0.39	0.39	0.43

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	38	41	56	6	18	21	26	34	40
38	0.48								
41	0.56	0.66							
56	0.46	0.54	0.43						
6	0.42	0.49	0.40	0.37					
18	0.46	0.55	0.44	0.41	0.45				
21	0.50	0.58	0.47	0.43	0.48	0.51			
26	0.53	0.63	0.51	0.47	0.52	0.55	0.60		
34	0.50	0.59	0.48	0.44	0.49	0.52	0.56	0.53	
40	0.53	0.62	0.50	0.46	0.51	0.55	0.59	0.56	0.59
45	0.53	0.63	0.51	0.46	0.51	0.55	0.59	0.56	0.59
48	0.50	0.59	0.48	0.44	0.49	0.52	0.56	0.53	0.56
51	0.41	0.48	0.39	0.36	0.40	0.42	0.46	0.43	0.45
55	0.49	0.57	0.46	0.43	0.47	0.51	0.54	0.51	0.54
9	0.38	0.45	0.36	0.33	0.37	0.40	0.43	0.40	0.42
20	0.38	0.45	0.36	0.33	0.37	0.39	0.42	0.40	0.42
35	0.48	0.57	0.46	0.42	0.47	0.50	0.54	0.51	0.53
43	0.50	0.59	0.47	0.43	0.48	0.52	0.55	0.52	0.55
46	0.44	0.52	0.42	0.39	0.43	0.46	0.49	0.46	0.49
23	0.49	0.58	0.47	0.43	0.48	0.51	0.55	0.52	0.54
2	0.48	0.56	0.46	0.42	0.46	0.50	0.54	0.50	0.53
8	0.45	0.53	0.43	0.39	0.43	0.46	0.50	0.47	0.49
11	0.48	0.57	0.46	0.42	0.47	0.50	0.54	0.51	0.54
27	0.53	0.62	0.51	0.46	0.51	0.55	0.59	0.56	0.59
39	0.50	0.59	0.48	0.44	0.49	0.52	0.56	0.53	0.56
3	0.45	0.53	0.43	0.39	0.43	0.46	0.50	0.47	0.50
16	0.48	0.56	0.45	0.42	0.46	0.49	0.53	0.50	0.53
32	0.51	0.61	0.49	0.45	0.50	0.53	0.58	0.54	0.57
36	0.40	0.47	0.38	0.35	0.39	0.41	0.45	0.42	0.44

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	45	48	51	55	9	20	35	43	46
45	0.59								
48	0.56	0.53							
51	0.45	0.43	0.35						
55	0.54	0.51	0.42	0.50					
9	0.42	0.40	0.33	0.39	0.31				
20	0.42	0.40	0.32	0.39	0.30	0.30			
35	0.53	0.51	0.41	0.49	0.38	0.38	0.48		
43	0.55	0.52	0.42	0.51	0.40	0.39	0.50	0.52	
46	0.49	0.46	0.38	0.45	0.35	0.35	0.44	0.46	0.41
23	0.54	0.52	0.42	0.50	0.39	0.39	0.49	0.51	0.45
2	0.53	0.50	0.41	0.49	0.38	0.38	0.48	0.50	0.44
8	0.50	0.47	0.38	0.46	0.36	0.35	0.45	0.46	0.41
11	0.54	0.51	0.41	0.49	0.39	0.38	0.49	0.50	0.45
27	0.59	0.56	0.45	0.54	0.42	0.42	0.53	0.55	0.49
39	0.56	0.53	0.43	0.51	0.40	0.40	0.51	0.52	0.46
3	0.50	0.47	0.38	0.46	0.36	0.35	0.45	0.46	0.41
16	0.53	0.50	0.41	0.49	0.38	0.38	0.48	0.49	0.44
32	0.57	0.54	0.44	0.52	0.41	0.41	0.52	0.53	0.47
36	0.44	0.42	0.34	0.41	0.32	0.32	0.40	0.41	0.37

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	23	2	8	11	27	39	3	16	32
23	0.50								
2	0.49	0.48							
8	0.46	0.45	0.42						
11	0.50	0.49	0.45	0.49					
27	0.54	0.53	0.50	0.54	0.59				
39	0.52	0.50	0.47	0.51	0.56	0.53			
3	0.46	0.45	0.42	0.45	0.50	0.47	0.42		
16	0.49	0.48	0.45	0.48	0.53	0.50	0.45	0.48	
32	0.53	0.52	0.48	0.52	0.57	0.54	0.48	0.51	0.55
36	0.41	0.40	0.37	0.41	0.44	0.42	0.37	0.40	0.43

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	36
36	0.33

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	1	10	12	15	19	22	25	30	33
1	0.00								
10	0.05	0.00							
12	0.01	0.06	0.00						
15	0.02	0.10	-0.01	0.00					
19	-0.00	0.02	0.10	-0.10	0.00				
22	-0.04	0.05	0.01	0.09	-0.10	0.00			
25	0.10	0.11	0.07	0.08	0.06	-0.08	0.00		
30	0.10	0.05	0.03	0.05	0.02	-0.04	0.06	0.00	
33	-0.13	-0.04	-0.01	-0.00	-0.03	-0.02	-0.07	0.01	-0.00
38	0.08	-0.01	-0.01	-0.02	-0.03	-0.02	-0.00	0.02	-0.06
41	0.02	-0.08	-0.06	-0.02	0.00	-0.00	-0.02	-0.09	0.03
56	-0.03	0.01	-0.02	0.05	0.08	0.12	-0.10	-0.02	0.10
6	0.02	0.10	0.08	0.06	-0.13	0.09	0.06	-0.02	0.01
18	0.05	-0.04	-0.03	0.03	0.00	0.00	-0.00	-0.06	-0.04
21	0.01	0.02	0.10	0.09	0.03	0.06	0.13	-0.05	-0.11
26	-0.08	-0.05	0.01	-0.06	0.03	-0.05	0.05	-0.04	-0.00
34	-0.02	-0.11	0.02	-0.18*	0.00	-0.04	0.00	0.07	0.06
40	-0.02	-0.05	-0.03	-0.09	-0.02	-0.08	-0.05	-0.06	-0.02
45	-0.07	-0.08	-0.03	-0.14*	-0.01	0.00	-0.08	-0.04	-0.03
48	-0.05	-0.00	0.05	-0.12	0.08	-0.11	-0.02	0.02	0.01
51	-0.07	-0.01	-0.05	0.04	-0.10	0.21*	0.13	-0.13	0.06
55	0.01	-0.02	0.07	0.05	0.03	-0.03	0.04	-0.03	-0.10
9	0.08	0.04	0.03	0.05	0.02	-0.02	-0.00	0.10	-0.08
20	0.05	-0.02	0.02	0.15	-0.02	0.08	0.11	0.08	0.08
35	-0.05	-0.07	-0.01	-0.03	0.08	0.07	0.04	0.15	-0.11
43	-0.03	0.01	0.05	0.05	0.01	0.06	0.03	0.06	0.03
46	-0.09	0.01	-0.01	-0.02	0.00	0.08	0.03	-0.09	0.08
23	0.06	0.09	-0.00	0.12	0.02	0.16*	0.03	0.00	-0.09
2	0.06	0.03	-0.10	-0.02	-0.05	-0.09	-0.07	-0.05	-0.03
8	0.05	0.02	-0.06	0.04	0.25**	0.07	-0.06	-0.03	0.11
11	0.03	0.07	0.01	0.02	-0.06	0.02	-0.03	0.07	0.03
27	-0.08	-0.06	-0.07	-0.06	-0.04	-0.02	-0.06	-0.05	-0.02
39	-0.08	-0.04	-0.10	-0.07	-0.07	-0.07	-0.09	-0.04	0.10
3	0.06	-0.09	-0.05	-0.07	0.04	-0.10	-0.05	0.00	0.01
16	0.04	-0.05	-0.02	0.00	0.12	-0.07	-0.10	-0.04	0.00
32	-0.08	0.04	0.01	-0.03	0.12	-0.08	-0.07	0.06	0.21
** 36	-0.01	-0.05	-0.03	-0.06	0.14	-0.12	-0.13	-0.05	0.09

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	38	41	56	6	18	21	26	34	40
38	0.00								
41	0.05	-0.00							
56	-0.06	0.09	0.00						
6	-0.08	0.01	-0.14	0.00					
18	0.13	0.03	-0.10	0.01	0.00				
21	0.05	-0.03	-0.18*	0.01	0.07	0.00			
26	0.02	0.03	0.04	-0.09	-0.02	0.08	-0.00		
34	0.04	0.04	-0.02	-0.02	-0.05	-0.10	0.01	0.00	
40	0.02	0.07	0.02	0.01	-0.03	-0.01	0.03	0.09	-0.00
45	-0.00	0.08	-0.04	0.00	0.03	-0.02	0.07	0.11	0.10
48	-0.04	-0.05	0.10	0.01	-0.09	-0.06	0.01	0.09	0.10
51	-0.07	0.03	0.02	0.06	-0.02	0.00	-0.08	-0.01	-0.04
55	-0.10	0.04	0.00	-0.01	0.06	0.16*	-0.03	-0.06	0.00
9	-0.07	0.01	-0.03	0.03	0.00	0.03	-0.05	-0.06	-0.01
20	-0.02	0.02	0.07	0.00	0.04	0.02	-0.06	-0.07	-0.11
35	0.06	0.04	0.06	-0.02	0.00	-0.02	0.05	0.07	-0.03
43	-0.02	0.07	0.05	0.02	0.02	0.04	-0.04	-0.04	0.03
46	-0.04	0.04	0.10	0.06	0.03	0.07	0.00	-0.09	-0.10
23	-0.04	-0.04	-0.02	0.07	-0.01	0.04	-0.05	-0.08	-0.08
2	-0.01	0.01	-0.16*	0.07	0.09	-0.02	0.07	-0.02	-0.03
8	-0.07	-0.12	-0.03	0.08	-0.10	-0.10	0.01	0.02	0.06
11	-0.01	-0.06	-0.09	0.03	-0.00	-0.02	-0.04	-0.05	0.03
27	0.07	-0.00	0.02	-0.06	0.07	0.04	0.08	0.05	0.08
39	0.15*	0.02	0.04	-0.07	-0.01	-0.06	0.05	0.13	0.12
3	0.05	-0.07	-0.05	-0.07	0.05	0.03	0.07	0.06	-0.06
16	0.07	-0.06	0.03	-0.04	-0.07	-0.06	0.03	0.00	0.04
32	-0.06	-0.02	0.05	-0.06	-0.08	-0.12	0.01	0.05	0.01
36	0.06	0.02	0.05	-0.07	0.02	-0.13	-0.00	0.10	0.10

Appendix J.1: First-Order Factor Confirmatory Factor Analysis: Cognitive Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	45	48	51	55	9	20	35	43	46
45	-0.00								
48	0.09	0.00							
51	0.04	-0.13	0.00						
55	0.08	0.01	0.08	0.00					
9	-0.00	0.01	-0.01	0.13	0.00				
20	-0.11	-0.05	0.09	0.02	0.12	0.00			
35	0.09	0.04	-0.09	-0.05	-0.02	0.03	0.00		
43	0.01	-0.00	-0.02	0.09	0.05	0.18*	0.16*	0.00	
46	0.02	-0.01	0.11	0.02	-0.04	0.15	0.08	0.05	0.00
23	-0.03	-0.06	0.05	0.13	0.11	-0.08	-0.02	-0.02	-0.06
2	0.04	-0.03	0.03	0.03	-0.01	-0.15	-0.05	-0.12	0.01
8	-0.03	-0.03	0.10	-0.05	0.02	-0.05	-0.17*	-0.16*	-0.02
11	-0.09	-0.09	0.03	-0.02	0.00	-0.02	-0.11	-0.10	-0.07
27	0.06	0.09	-0.05	-0.07	0.01	-0.07	-0.02	-0.01	0.03
39	0.02	0.03	0.01	-0.11	-0.07	-0.01	-0.04	-0.09	-0.04
3	0.07	0.02	-0.06	-0.02	-0.01	-0.12	-0.03	-0.11	-0.02
16	-0.06	0.06	-0.02	-0.10	-0.11	-0.14	-0.02	-0.15*	-0.12
32	-0.03	0.02	-0.10	-0.15*	-0.11	-0.08	-0.02	-0.07	-0.05
36	-0.00	0.08	-0.03	-0.09	-0.15	-0.15	-0.05	-0.07	-0.10

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	23	2	8	11	27	39	3	16	32
23	0.00								
2	0.03	0.00							
8	0.08	0.10	0.00						
11	0.01	0.07	0.17*	0.00					
27	-0.07	0.02	-0.00	-0.03	-0.00				
39	-0.07	0.01	0.07	0.06	0.16*	0.00			
3	-0.07	0.16*	0.10	0.03	0.08	-0.06	0.00		
16	0.03	0.06	0.09	0.08	-0.00	0.03	0.18*	0.00	
32	-0.06	-0.00	0.08	0.11	-0.04	0.07	0.08	0.16*	-0.00
36	-0.08	0.10	0.06	0.02	-0.00	0.13	0.03	0.16	0.23

**

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	36
36	0.00

* :Significantly deviates STANDARD ERROR of EXPECTED r at p=.05
**:Significantly deviates from STANDARD ERROR of EXPECTED r at p=.01

Appendix J.2: First-Order Factor Confirmatory Factor Analysis: Behavioral Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	1	10	20	31	8	21	27	30	3
1	0.55								
10	0.76	0.47							
20	0.59	0.65	0.55						
31	0.64	0.58	0.62	0.49					
8	0.41	0.47	0.56	0.59	0.55				
21	0.49	0.45	0.65	0.63	0.78	0.69			
27	0.41	0.45	0.48	0.47	0.65	0.62	0.41		
30	0.48	0.42	0.60	0.61	0.64	0.79	0.58	0.62	
3	0.75	0.60	0.50	0.56	0.43	0.53	0.43	0.44	0.56
7	0.52	0.49	0.38	0.35	0.37	0.34	0.23	0.32	0.56
19	0.42	0.28	0.47	0.36	0.33	0.47	0.24	0.55	0.45
25	0.59	0.49	0.45	0.42	0.49	0.60	0.50	0.57	0.58
4	0.51	0.41	0.50	0.40	0.54	0.62	0.47	0.61	0.62
9	0.55	0.55	0.61	0.49	0.66	0.67	0.53	0.63	0.57
17	0.45	0.38	0.47	0.44	0.63	0.75	0.56	0.68	0.50
29	0.55	0.54	0.53	0.48	0.54	0.61	0.47	0.65	0.62

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRE ATION MATRIX

	7	19	25	4	9	17	29
7	0.31						
19	0.33	0.31					
25	0.48	0.43	0.56				
4	0.48	0.54	0.61	0.60			
9	0.48	0.39	0.66	0.70	0.68		
17	0.37	0.38	0.71	0.73	0.74	0.60	
29	0.47	0.50	0.57	0.69	0.72	0.65	0.63

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	1	10	20	31	8	21	27	30	3
1	0.55								
10	0.51	0.47							
20	0.55	0.51	0.55						
31	0.52	0.48	0.51	0.49					
8	0.55	0.51	0.55	0.52	0.55				
21	0.62	0.57	0.62	0.58	0.62	0.70			
27	0.48	0.44	0.48	0.45	0.48	0.54	0.41		
30	0.59	0.54	0.58	0.55	0.58	0.66	0.51	0.62	
3	0.56	0.51	0.55	0.52	0.55	0.62	0.48	0.59	0.56
7	0.41	0.38	0.41	0.39	0.41	0.46	0.36	0.44	0.41
19	0.41	0.38	0.41	0.39	0.41	0.46	0.36	0.44	0.41
25	0.56	0.51	0.55	0.52	0.56	0.62	0.48	0.59	0.56
4	0.58	0.53	0.57	0.54	0.57	0.64	0.50	0.61	0.58
9	0.62	0.57	0.61	0.58	0.61	0.69	0.53	0.65	0.62
17	0.58	0.53	0.57	0.54	0.58	0.65	0.50	0.61	0.58
29	0.59	0.54	0.59	0.55	0.59	0.66	0.51	0.62	0.59

Appendix J.2: First-Order Factor Confirmatory Factor Analysis: Behavioral Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	7	19	25	4	9	17	29
7	0.31						
19	0.31	0.31					
25	0.42	0.42	0.56				
4	0.43	0.43	0.58	0.60			
9	0.46	0.46	0.62	0.64	0.68		
17	0.43	0.43	0.58	0.60	0.64	0.60	
29	0.44	0.44	0.59	0.61	0.65	0.61	0.63

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	1	10	20	31	8	21	27	30	3
1	0.00								
10	0.25**	0.00							
20	0.04	0.14	0.00						
31	0.13	0.10	0.11	0.00					
8	0.14*	-0.04	0.02	0.07	0.00				
21	-0.12*	-0.12	0.04	0.05	0.16**	-0.00			
27	-0.07	0.01	0.00	0.02	0.17**	0.09	0.00		
30	-0.11	-0.12	0.01	0.06	0.05	0.13*	0.07	-0.00	
3	0.19**	0.09	-0.05	0.04	-0.12	-0.09	-0.05	-0.15*	0.00
7	0.11	0.11	-0.03	-0.04	-0.04	-0.12	-0.12	-0.12	0.14
19	0.01	-0.10	0.06	-0.03	-0.08	0.00	-0.12	0.11	0.04
25	0.03	-0.02	-0.11	-0.10	-0.06	-0.02	0.02	-0.02	0.02
4	-0.07	-0.12	-0.08	-0.14*	-0.03	-0.03	-0.03	-0.00	0.04
9	-0.07	-0.02	-0.00	-0.09	0.05	-0.02	-0.00	-0.02	-0.04
17	-0.13	-0.15*	-0.10	-0.10	0.05	0.10	0.06	0.07	-0.08
29	-0.04	-0.00	-0.06	-0.07	-0.05	-0.05	-0.04	0.02	0.03

SPEARMAN TEST 1 INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	7	19	25	4	9	17	29
7	0.00						
19	0.02	0.00					
25	0.06	0.01	0.00				
4	0.05	0.11	0.03	0.00			
9	0.02	-0.07	0.04	0.06	-0.00		
17	-0.06	-0.04	0.13*	0.13*	0.10	0.00	
29	0.03	0.06	-0.02	0.08	0.06	0.03	-0.00

* :Significantly deviates STANDARD ERROR of EXPECTED r at p=.05
**:Significantly deviates from STANDARD ERROR of EXPECTED r at p=.01

Appendix J.3: First-Order Factor Confirmatory Factor Analysis: Motivational Items

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
OBSERVED MATRIX -- ORIGINAL CORRELATION MATRIX

	36	39	41	55	65	37	38	42	54
36	0.34								
39	0.48	0.38							
41	0.45	0.53	0.57						
55	0.49	0.56	0.57	0.51					
65	0.44	0.33	0.44	0.50	0.33				
37	0.37	0.33	0.49	0.37	0.32	0.42			
38	0.22	0.28	0.44	0.34	0.33	0.60	0.37		
42	0.29	0.40	0.45	0.44	0.28	0.41	0.42	0.42	
54	0.24	0.23	0.39	0.33	0.31	0.41	0.51	0.61	0.35

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
EXPECTED MATRIX -- CORRELATION MATRIX CREATED FROM FACTOR LOADINGS

	36	39	41	55	65	37	38	42	54
36	0.33								
39	0.36	0.38							
41	0.44	0.46	0.57						
55	0.42	0.44	0.54	0.51					
65	0.33	0.35	0.43	0.41	0.33				
37	0.38	0.40	0.49	0.47	0.37	0.42			
38	0.35	0.38	0.46	0.44	0.35	0.40	0.37		
42	0.37	0.40	0.49	0.46	0.37	0.42	0.39	0.42	
54	0.34	0.36	0.45	0.42	0.34	0.38	0.36	0.38	0.35

SPEARMAN TEST INTERNAL CONSISTENCY/FACTOR 501
DEVIATION MATRIX -- OBSERVED MINUS EXPECTED

	36	39	41	55	65	37	38	42	54
36	0.00								
39	0.13	0.00							
41	0.02	0.06	-0.00						
55	0.08	0.12	0.03	-0.00					
65	0.11	-0.02	0.01	0.09	0.00				
37	-0.00	-0.07	0.00	-0.10	-0.05	0.00			
38	-0.14	-0.09	-0.02	-0.10	-0.02	0.20*	0.00		
42	-0.09	-0.00	-0.04	-0.02	-0.09	-0.01	0.02	0.00	
54	-0.10	-0.13	-0.06	-0.10	-0.03	0.03	0.15	0.23**	0.00

AVERAGE CORRELATION: 0.405
STANDARD ERROR: 0.083

* :Significantly deviates from STANDARD ERROR of MEAN r at p=.05
**:Significantly deviates from STANDARD ERROR of MEAN r at p=.01