Toward the development and validation of a measure of cognitive communication competence

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Toward the Development and Validation of a Measure of Cognitive Communication Competence

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The purpose of this study was to develop a measure of cognitive communication competence and begin the process of collecting evidence of its validity. A review of literature indicated four temporarily discrete mental processes essential to cognitive communication competence: 1) the anticipation of contextual variables that may potentially influence one's communication choices, 2) perception of the consequences of one's communication choices, 3) immediate reflection, and 4) general reflection upon the choices one has made. Subjects completed measures of Cognitive Communication Competence (CCCS), Self-Monitoring, Interaction Involvement, and Communicative Knowledge. Results indicated a five factor solution which was not identical with the original conceptualized dimensions of the CCCS. The factor structure that emerged did reflect a temporal separation of cognitions but it also revealed different types of communication cognitions. Additionally, support was provided for the construct validity of the CCCS. Implications of these results and suggestions for future research are discussed.

KEY CONCEPTS: Communication competence, communication cognitions, interaction involvement, self-monitoring

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P hillips (1984) argues that conceptualizing communication competence is "like trying to climb a greased pole" (p. 25). Although scholars differ in their conceptualizations of communication competence, they generally agree that it consists of cognitive, affective, and psycho-motor domains (McCroskey, 1982; Spitzberg, 1983, 1990). Most research in the area of communication competence has focused on the psycho-motor and, to a lesser extent, the affective domain (e.g. communication apprehension, willingness to communicate). Little research, however, has directly considered the cognitive domain of communication competence.

This paper describes the development of a measure of cognitive communication competence and offers preliminary evidence of its validity. Initially, cognitive theories of communication are discussed as a backdrop for a conceptualization of cognitive communication competence. Secondly, the conceptualization and components of cognitive communication competence are articulated. Finally, three constructs that are employed in the construct validation process are reviewed: communicative knowledge (Spitzberg, 1990), interaction involvement (Cegala, 1981), and self-monitoring (Lennox & Wolfe, 1984).

Review of Relevant Literature

In their review, Spitzberg and Cupach (1984) identify six broad categories of competence: fundamental competence, social skills and competence, interpersonal competence, linguistic competence, communicative competence, and relational competence. The authors note that these categories are neither necessarily exhaustive nor mutually exclusive; rather, they are general groupings by which conceptualizations of communication competence can be organized. It is beyond the scope of this paper to provide an in-depth discussion of all these approaches. Our purpose is to discuss the conceptual approach most consistent with an emphasis on the cognitive domain of communication competence.

The most basic form of communication competence is fundamental competence: "an individual's ability to adapt effectively to the surrounding environment over time" (Spitzberg & Cupach, 1984, p. 35). The critical feature of this definition is the focus upon adaptability, which is an almost universally accepted feature of communication competence (Brunner & Phelps, 1979; Duran & Kelly, 1984; Foote & Cottrell, 1955; Hale & Delia, 1976; Hart & Burks, 1972). Given the centrality of adaptability, fundamental competence is a useful starting point for more elaborate models of competence. Conceptualizations that incorporate the concept of adaptability are concerned with the cognitive and perceptual processes involved in the ability to adapt one's communication behaviors across contexts. Specifically, adaptability is accomplished by perceiving contextual parameters and enacting communication appropriate to the setting. As a result, researchers in this area are concerned with the psychological and psycho-motor processes that facilitate cross-contextual performances. Concepts such as role-taking, flexibility, empathy, behavioral repertoires, and style-flexing are assumed to aid in this process.

Spitzberg and Cupach (1984) summarized the fundamental competence approach as follows: "the *sine qua non* of fundamental competence is cross-situational adaptability . . . theories are concerned with the acquisition and development of adaptability and its cognitive precursors. The explanations for competence are generally cognitive and person-centered. Messages, per se, are not focal points for this literature" (p. 40). One cognitive approach to the study of interpersonal communication that has a fairly well established corpus of research is action assembly theory (Greene, 1984; Greene & Lindsey, 1989).

Action assembly theory offers an explanation of cognitive processes involved in producing effective communication performances. Action assembly theory begins with the assumption that there are two domains of knowledge: conceptual and procedural. The purpose of the theory is to articulate procedural knowledge. Greene (1984) states that, "procedural knowledge refers to stored action specifications, at a range of levels of abstraction, upon which an individual may draw in order to accomplish his or her desired ends. In short, the procedural store represents those things we have learned to do, and not to do, in order to act efficaciously" (p. 291).

The fundamental premise of the theory is that individuals store action-outcome contingencies that are used to guide behavior. Individuals develop "a repository of procedural knowledge whose units are records of action-outcome relationships which have been acquired through past experiences" (Greene, 1984, p. 292). Procedural memory consists of modular elements of varying levels of abstraction derived from action-outcome contingencies. The relevant modular elements are activated by an individual's pursuit of a desired outcome and by contextual parameters that have proven to affect outcomes through past experiences. When the relevant modules and procedural records are activated they must be assembled in a form that results in a coherent communication performance. The assembled representation "reflects a number of levels of abstraction from high-level conceptual representations to low-level motor codes" (p. 294).

Greene (1984) contends that procedural records are differentiated by various communication functions, including concerns with content formulation functions, utterance formulation, regulatory functions, and homeostatic functions. These functions are hierarchically arranged from "a general conception to specific motor commands" (Greene, 1984, p. 296), into four major hierarchical levels: 1) interaction representation, 2) ideational representation, 3) utterance representation, and 4) sensorimotor representation.

The construction of effective representations is a dynamic process in that goals and salient contextual parameters change as interaction unfolds. Action assembly theory conceptualizes cognitive processes involved in the production of communication performances. It relies primarily upon the processing and storage of action-outcome contingencies. Cognitive communication competence represents the anticipation of potentially salient contextual parameters and reflection upon the consequences of an individual's social performance. The storage and modification of action-outcome contingencies results from one's reflection concerning his or her performance. Essentially, cognitively competent communicators think about how the other interpreted and responded to what was said, what communication tactics were successful and unsuccessful, and what could have been said. This cognitive process contributes to the storage and refinement of action-outcome contingencies.

The question is: "How do some people develop and refine action-assembly contingencies that are more effective than others?" It is maintained here that those who are more cognitively competent spend more time thinking about their self-presentation and communication in general.

Cognitive Communication Competence

Based upon this review, it seems reasonable to propose that the cognitive dimension of competence is a set of mental processes that include several abilities: the ability to perceive situational variables that have the potential to influence one's communication choices (e.g., who will be there, where it is, what people will be talking about, etc.); the ability to select behaviors adaptive to those situational variables and anticipate the consequences of those behavioral choices; the ability to perceive how the other is responding to one's communication choices and alter those choices to refine one's behavioral repertoire for future encounters; and, general reflection about performances. Thus, the cognitive dimension of competence involves several important mental activities of a proactive and reflective nature.

First, cognitive competence involves the ability to perceive and anticipate situational variables that have the potential to influence one's communication choices in a given situation. Other scholars have discussed the concept of situation and its components (e.g., Cody & McLaughlin, 1985; Spitzberg & Cupach, 1984). One conceptualization of context is presented by Spitzberg and Brunner (1991), who outline five global characteristics of social contexts: culture, type, relationship, function, and control. Cognitive competence clearly depends, in large part, upon the interactant's ability to interpret these facets of any situation, to ascertain the relevant rules and expectations, and to otherwise perceive dimensions of situations that may influence their behavior (Forgas, 1982). To make communication choices that are adaptive to the situation, one must be able to identify variables that influence the situation.

Secondly, individuals must be capable of monitoring the progress of an interaction. As Greene (1984) points out, the variables and the salience of those variables that impact interaction are continuously changing. As a result, it is not sufficient for an effective presentation only to anticipate potential contextual parameters. Cognitive competence also requires an individual to monitor, in real time, how an interaction is evolving. Attention to how the other is responding and changes in the communication environment aid in effective and appropriate self-presentational adaptation.

Finally, the individual must be able to engage in a reflective process immediately following the interaction and generally play the role of a "student" of interaction. In this process the person considers the choices he or she has made and the responses to these choices. It is through this process that the individual refines his or her repertoire of behavioral choices to include new successful behaviors and exclude inadequate or unsuccessful behaviors.

Therefore, cognitive communication competence is conceptualized as a function of four mental processes: 1) *anticipation* of situational variables that have the potential to influence one's communication behaviors, 2) perception of the *consequences* of one's communication choices, 3) *immediate reflection*, and 4) *continued reflection* upon the choices one has made. We developed a measure of these processes, which will be referred to as the Cognitive Communication Competence Scale (CCCS).

The present investigation represents an extension of an earlier study that attempted to develop and assess the validity of a measure of cognitive communication competence (Duran, Kelly, Schwager, Carone, & Stevens, 1993). The CCCS received moderate support as a valid measure of the construct. Initially, sixteen items were written to measure four dimensions of cognitions about communication: 1) upon entering a conversational context, 2) during a conversation, 3) immediately after a conversation, and 4) upon subsequent reflection about the consequences of one's communicative choices. Factor analysis, however, produced a one-factor solution. The factor measured reflections concerning the consequences of one's communication choices. Items indicative of this factor were: "After a conversation I think about my performance," "After a conversation I think about what I said," and "I think about how others might interpret what I say." Although only one factor emerged consisting of eight items, the factor loadings and reliability coefficient indicated a strong factor. Factor loadings ranged from .61 to .75, with an alpha reliability of .86, accounting for 30% of the common variance.

Additionally, the construct validity was assessed by investigating the relationship of the CCCS with the Communicative Adaptability Scale (CAS, Duran, 1983, 1992) and coded responses to an interpersonally problematic scenario. The CCCS was significantly correlated with two of the dimensions of the CAS: social composure and social confirmation. Cognitive communication competence was inversely related to social composure, indicating that the more anxious one is the less cognitive attention she or he pays to communication choices and their consequences.

The CCCS was also significantly correlated with social confirmation. Social confirmation measures an individual's sensitivity, desire, and ability to acknowledge the projected line of the other. This ability requires a great deal of perceptiveness, which is largely a cognitive task. Those who are more cognizant of the consequences of their communication choices are more socially confirming.

As an initial step towards establishing criterion-related validity of the CCCS, the measure was compared to the open-ended responses of subjects to an interpersonally problematic scenario. The written responses were coded for eight variables reflecting subjects' sophistication and complexity of their analysis of the scenario. The CCCS demonstrated encouraging criterion-related validity, with those scoring higher on the scale showing more concern for the complexity of the scenario than those scoring lower. Specifically, significant differences between high and low subjects on the CCCS were observed on two dependent variables. High CCCS participants provided more and better developed justifications for their chosen solution to the interpersonal scenario than low CCCS individuals. Also, those scoring high on the CCCS were likely to take the history of the friendship relationship into account when choosing a solution to the scenario than those scoring low. Additionally, there was a trend toward high CCCS subjects

taking the perspective of the other person when developing a solution to the interpersonal problem, compared to low CCCS subjects.

Together, the results suggest that those individuals reporting that they think about the consequences of what they are saying after an interaction produce more sophisticated responses to an interpersonal problem than those who were less communicatively reflective. Those individuals who demonstrated higher quality justifications for their behaviors were more likely to consider previous attempts to solve the problem (history of the relationship), and were more concerned with the perspective of the other.

The purpose of the present study is to continue the process of establishing the validity of the Cognitive Communication Competence Scale (Duran et al., 1993). Three constructs that measure different aspects of the cognitive processes involved in producing competent performances were chosen as construct validation variables: communicative knowledge (Spitzberg, 1990), interaction involvement (Cegala, 1981), and self-monitoring (Lennox & Wolfe, 1984). The following discussion describes the conceptualization, measurement, and relevant research results concerning these three constructs.

Communicative Knowledge

Spitzberg (1990) refers to the cognitive dimension of communication competence as communicative knowledge. Communicative knowledge was conceptualized as knowing what to say and do in communication contexts. As a trait or dispositional measure it was originally conceptualized as being comprised of four dimensions: topical development (e.g., "I am almost never at a loss to find something to talk about"); interaction management (e.g., "I often find that I am not sure of whose 'turn' it is to say something in a conversation"); informational acquisition (e.g., "I am careful to find out all I can about people and situations when I am going to encounter them for the first time"); and strategic orientation (e.g., "I like to 'plan' what will happen in conversations I know I'm going to face") (Spitzberg, 1990). However, factor analysis produced a unidimensional factor structure. After further analysis Spitzberg (1990) concluded that "it is fairly clear that it (Communicative Knowledge Scale) is not exclusively measuring knowledge as originally conceptualized . . . this knowledge measure may be assessing a construct similar to self-efficacy beliefs" (p. 111). Self-efficacy beliefs are cognitions reflecting confidence in one's ability to employ communication to attain positive outcomes (Bandura, 1977). Self-efficacy is, therefore, primarily a knowledge construct with motivational consequences: the more an actor believes him- or herself capable (thus, knowledgeable) of performing adequately, the more motivated he or she is. The Communicative Knowledge Scale was related to constructs reflecting "internal locus of control, self-esteem, independence, confidence, and assertiveness" (Spitzberg, 1990, p. 113).

The Communicative Knowledge Scale was chosen because it was originally conceptualized as a dispositional measure of the cognitive component of communication competence. Although this construct may not be exclusively measuring communication knowledge, it does seem to tap some of the cognitive processes responsible for perceptions of self-efficacy, confidence, and assertiveness. Cognitive communication competence should also be related to feelings of self-efficacy. Thinking about one's social communication performances prior, during, immediately following, and in general should increase the likelihood that one engages in competent interactions and, in turn, develops confidence.

Interaction Involvement

Interaction involvement has been conceptualized as one cognitive dimension of communicative competence (Cegala, 1981). Grounded in the work of Goffman (1959, 1963,

1967), interaction involvement is concerned with face-work and face-saving, both of which are accomplished by perceptiveness and attentiveness. Perceptiveness "involves the integration of meanings of self in relation to another" (Cegala, 1981, p. 111). It is the ability to observe the other and how the other is responding to self (Cegala, Savage, Brunner, & Conrad, 1982). Attentiveness is the extent to which an individual pays attention to an ongoing interaction. Cegala (1981) defined interaction involvement as "the extent to which an individual partakes in a social environment" (p. 112). Cegala explicates the construct: "An individual's consciousness is directed toward self and an immediate other . . . he or she is engaged in an accounting of 1) alter's behavior and 2) how alter is perceiving self" (p. 112). Subsequent research utilizing the Interaction Involvement Scale has produced a three-factor solution (Cegala, et al., 1982). The first factor is responsiveness and is described as "an index of an individual's tendency to deliver lines appropriate to the situation" (Cegala et al., 1982, p. 233). The second factor is perceptiveness, which is an individual's ability to assign meaning to others' behaviors and interpret the meanings others assign to one's own behaviors. Attentiveness, the third factor, describes one's degree of cognitive involvement in an interaction.

In validating the Interaction Involvement Scale (IIS), perceptiveness effectively discriminated between low and high success interactants, correctly classifying 70 percent of the participants (Cegala, 1981). These results suggest that face-work and face-saving is a function of one's ability to monitor the evolution of the interaction. Specifically, those able to elicit desired information in socially appropriate ways were more aware of how others evaluated self and other's behaviors than those who were either not able to obtain information or did not obtain information appropriately.

Further, validating the factor structure of the IIS, Cegala et al. (1982) correlated interaction involvement with several other constructs including extroversion, neuroticism, self-consciousness, communication apprehension, and communication competence. Of particular interest to the present study, significant negative correlations were observed between the three IIS dimensions and self-consciousness and communication apprehension, and significant positive correlations were obtained for communication competence.

Self-Monitoring

Snyder (1974, 1979) conceptualized self-monitoring as an individual's ability to adapt his/her self-presentation to the requirements of the context. That is, individuals high in self-monitoring are able to perceive situational cues and alter their communication performance accordingly. As originally conceptualized, self-monitoring consisted of five components: 1) concern for appropriateness, 2) awareness of social comparison information, 3) ability to adapt self-presentation, 4) use of this ability, and 5) cross-situational variability of social performances. Subsequent research has indicated three components of self-monitoring: acting ability, extraversion, and other-directedness (Briggs, Check, & Buss, 1980; Lennox, 1982).

Through a series of studies, Lennox and Wolfe (1984) reconceptualized the self-monitoring construct as an individual's sensitivity to the other's self-presentation. Conceptual and empirical analysis indicated a two component model: ability to modify self-presentation and sensitivity to expressive behavior of others. The reconceptualization resulted in the development of the Revised Self-Monitoring Scale. Due to differential correlations with relevant third variables, Lennox and Wolfe (1984) recommended that the components and subsequent sub-scales be scored separately.

Spitzberg's (1990) research found that self-monitoring was significantly related to communicative knowledge ($r=.62$). Additionally, knowledge was significantly correlated with both ability to modify self-presentation ($r=.59$) and sensitivity to expressive behavior ($r=.55$).

Duran and Spitzberg

Although not isomorphic, it appears communicative knowledge and self-monitoring are tapping a larger cognitive construct and that both variables are responsible for perceptions of self-efficacy.

Cognitive communication competence is conceptualized as an individual's ability to think about communication contexts prior to, during, and after engaging in social interactions. Additionally, cognitive competence entails a general reflection about one's social performances. The fundamental components of self-monitoring are sensitivity to situational cues and the ability to modify self-presentation. Both of these skills require self-reflection, which is a fundamental element of the cognitive communication competence construct presented here.

Rationale and Hypotheses

In this investigation, cognitive communication competence was conceptualized as comprised of four components: 1) *anticipation* of situational variables that have the potential to influence one's communication behaviors, 2) *perception of the consequences* of one's communication choices during an interaction, 3) *immediate reflection* upon one's social performance after an interaction, and 4) *general reflection* and interest in observing social interaction. This study is an initial effort at development and validation of the Cognitive Communication Competence Scale. One question concerns the dimensional structure of the measure. Therefore, the following research question was posed:

> *RQ*1: What is the dimensional structure of the Cognitive Communication Competence Scale?

In addition to the development of the measure of cognitive competence, this study sought to assess the construct validity of the CCCS. Three constructs were selected for this purpose: communicative knowledge, interaction involvement, and self-monitoring. Given that communicative knowledge assesses reflection upon an individual's communication performances and self-efficacy beliefs (Spitzberg, 1990), the following hypothesis was posited:

> *H*1: Cognitive communication competence is positively related to communication knowledge.

Interaction involvement is concerned with an awareness of self, other, and how one's performance is being perceived by the other. Three dimensions facilitate this process: responsiveness, perceptiveness, and attentiveness. These dimensions measure the ability to communicate appropriately, accurately interpret the meaning of self's and alter's behavior, and stay cognitively involved during an interaction. Involvement in an interaction is contingent upon knowing what to look for, that is, which situational cues are most salient in shaping the communication context. Therefore, the following hypothesis was posed:

> *H*2: Cognitive communication competence is positively related to interaction involvement.

Self-monitoring is another cognitive construct of interaction skills. It is an ability to adapt one's self-presentation to contextual requirements. According to Lennox and Wolfe (1984), self-monitoring is comprised of two dimensions: ability to modify self-presentation and sensitivity to alter's expressive behaviors. Since cognitive communication competence reflects

an individual's ability to anticipate, monitor, and react to salient contextual cues, the following hypothesis was posited:

$H3$:   Cognitive communication competence is positively related to self-monitoring.

Method

Subjects

Data were collected at three universities. Subjects were students enrolled in basic communication courses at a small, private, northeastern university, a mid-sized public institution in the southwest, and a large public institution in the west for a total sample size of 411. Students did not receive compensation for participation in the study. The subjects were debriefed about the purpose of the investigation following completion of data collection.

Measures

Cognitive Communicative Competence Scale. A 27-item scale, designed to measure four a priori dimensions, was developed to assess one's cognitions about communication performances. The four dimensions assessed a reflective tendency about communication: 1) *prior to* entering a conversational context, 2) *during* a conversation, 3) *after* a conversation, and 4) general *reflection* about one's communicative choices.

The initial investigation of the CCCS (Duran, et al., 1993) resulted in 8-items measuring one dimension, which tapped reflections concerning the consequences of one's communicative performance (a combination of factors three and four). As a result, the present investigation retained those 8 items and wrote or modified 19 additional items to measure communication cognitions prior to and during interactions. Additionally, statements were written to better differentiate communication cognitions immediately after an interaction from general reflections about the consequences of one's performance. The revised CCCS consisted of approximately 7-items per dimension with the goal of discovering four to five reliable indicators of four dimensions of cognitive communication competence.

Communicative Knowledge Scale. Communication knowledge was operationalized by a 25-item, self-report, Likert-type scale (Spitzberg, 1990). The scale was an adaptation of an existing situational measure (Spitzberg & Hurt, 1987) to a dispositional scale. The knowledge measure had an alpha reliability of .82 (Cronbach, 1951).

Interaction Involvement Scale. Interaction involvement was measured by the Interaction Involvement Scale (IIS), which consists of 18, Likert-type statements measuring three dimensions (Cegala, 1981): responsiveness (α=.79), perceptiveness (α=.83), and attentiveness (α=.75).

Revised Self-Monitoring Scale. Self-monitoring was measured by the Revised Self-Monitoring Scale (Lennox & Wolfe, 1984). The measure is a self-report consisting of 13, Likert-type statements. The scale may be treated as a composite score, but is more appropriately applied as separate sub-scales. The sub-scales are ability to modify self-presentation (7-items, α=.76) and sensitivity to expressive behavior of others (6-items, α= .74).

Data Analysis

To test *RQ*1 regarding the dimensional structure of the CCCS, a principle factors factor analysis with oblique rotation was performed. For a dimension to be considered meaningful at least three items must have a loading of `.60 with no cross-loading exceeding .40. To test *H*1 and *H*3, stepwise multiple regressions were performed. The dependent variables were the Communicative Knowledge Scale and the Revised Self-Monitoring Scale. The dimensions of the CCCS served as the independent variables. To test *H*2, a canonical correlation analysis was performed with dimensions of the CCCS comprising one variate and dimensions of the IIS serving as the other variate. The construct intercorrelations are reported in Table 1. The .05 level of significance was required for all statistical tests.

TABLE 1. Intercorrelations among Communication Constructs

	Modprs	Senothr	Percep	Respon	Attent	Plan	Pres	Mod	Reflect	Conseq	Kno
Modprs	1.00*	.50	.52	.55	.21	-.06	.43	.24	-.01	.08	.77
Senothr	.37	1.00	.71	.33	.24	.14	.51	.55	.14	.28	.60
Percep	.42	.56	1.00	.51	.47	.19	.57	.53	.18	.39	.71
Respon	.43	.25	.41	1.00	.74	.19	.33	.13	-.16	.06	.77
Attent	.16	.18	.38	.57	1.00	.09	.22	.14	-.12	.08	.40
Plan	-.05	.10	.15	-.15	-.07	1.00	.20	.37	.62	.41	-.01
Pres	.31	.36	.43	.24	.16	.14	1.00	.49	.20	.43	.54
Mod	.20	.38	.41	.10	.13	.27	.33	1.00	.39	.47	.33
Reflect	.02	.11	.15	-.13	.09	.48	.16	.31	1.00	.60	-.03
Conseq	.06	.22	.32	.05	.06	.32	.32	.50	.36	1.00	.30
Kno	.61	.47	.59	.62	.32	-.01	.41	.20	.10	.24	1.00
Mean	3.53	3.53	3.59	3.59	3.35	3.02	3.97	3.56	3.42	3.44	3.48
S.D.	.57	.57	.51	.58	.65	.61	.56	.64	.76	.69	.40

Modprs = Ability to modify self-presentation; Senothr = Sensitivity to the behaviors of the other; Percep = Perceptiveness; Respon = Responsiveness; Attent = Attentiveness; Plan = Planning cognitions; Pres = Presence cognitions; Mod = Modeling cognitions; Reflect = Reflection cognitions; Conseq = Consequence cognitions; Kno = Communicative knowledge

NOTE: $r = .10$, $p < .05$; $r = .12$, $p < .01$ N = 411

* Correlation coefficients above the diagonal (1.00) have been corrected for attenuation; those below the diagonal are the product of observed scores.

Results

The 27-item CCCS was subjected to principal components factor analysis with oblique rotation (*RQ*1). Five dimensions with eigenvalues exceeding 1.00 were extracted accounting for 57% of the variance (Table 2). This study represented only the second in a series of studies attempting to develop a measure of cognitive communication competence. As a result, the .60/.40 criterion was relaxed. Two items (1 and 5) which measured planning cognitions had primary loadings of .56 and .55 and cross-loadings of .29 and .38 respectively, were retained in the final factor solution. The five factors extracted were not identical with the originally

conceptualized dimensions. The dimensions were originally conceived as temporarily discrete cognitions about communication, that is, cognitions about communication choices and consequences *prior, during, immediately after,* and *generally*. The factor structure that emerged did reflect a temporal separation of cognitions but it also revealed different types of communication cognitions.

TABLE 2. Principal Factors Factor Analysis of Cognitive Communication Competence Scale

*Items	**Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1.	.29	.08	*.56*	.25	.15
2.	.32	.00	*.77*	.12	.22
3.	.32	.10	*.77*	.04	.18
4.	.27	.10	*.75*	.19	.20
5.	.38	.09	*.55*	.27	.10
6.	.27	.12	.25	*.71*	.18
7.	.18	.18	.34	*.68*	.13
8.	.13	.16	.00	*.75*	.29
9.	.21	.37	.03	*.60*	.27
10.	.09	*.80*	.07	.16	.10
11.	.02	*.79*	.06	.18	.25
12.	.30	*.64*	.16	.31	.27
13.	.04	*.60*	.03	.12	.20
14.	*.75*	.21	.33	.23	.29
15.	*.85*	.01	.39	.22	.32
16.	*.86*	.09	.38	.25	.33
17.	*.80*	.10	.25	.15	.32
18.	*.69*	.03	.37	.21	.38
19.	.39	.11	.25	.29	*.70*
20.	.32	.20	.21	.26	*.82*
21.	.30	.30	.14	.22	*.83*
22.	.33	.24	.23	.19	*.79*
Eigenvalue =	5.89	2.35	1.64	1.34	1.28
Cronbach's Alpha =	.86	.68	.73	.71	.81
Proportion of Variance =	27%	11%	7%	6%	6%

* For item content see Appendix A

** Factor 1 = Reflection Cognitions; Factor 2 = Presence Cognitions; Factor 3 = Planning Cognitions; Factor 4 = Modeling Cognitions; Factor 5 = Consequence Cognitions

The final solution consisted of 22-items (See Appendix A). The first factor accounted for 27% of the shared variance and was measured by 5-items tapping thoughts about how one performed immediately after an interaction and was labeled *reflection cognitions* and had an alpha reliability of .86 (Cronbach, 1951). The second factor accounted for 11% of the variance and was measured by 4-items reflecting cognitions about the success of one's communication tacts. Factor two was labeled *presence cognitions* and had an alpha reliability of .68. The third factor accounted for 7% of the variance and was measured by 5-items reflecting cognitions about, and mental rehearsal of, possible topics of conversation. Factor three was labeled *planning cognitions* and had an alpha reliability of .73. The fourth factor accounted for 6% of the shared variance and was measured by 4-items tapping observations of who is talking with whom, about what, for the purpose of "sizing up" the event. Factor four was labeled *modeling cognitions* and had an alpha reliability of .71. Factor five was labeled *consequence cognitions* and was measured by 4-items. The fifth factor accounted for 6% of the variance and had an alpha reliability of .81.

*H*1 was tested by a stepwise multiple regression with the knowledge scale serving as the dependent variable and the five dimensions of the CCCS serving as the independent variables. A significant multiple regression was produced ($R = .47$; $F = 28.51$; d.f. $= 4,406$; $p < .01$) with the CCCS dimensions accounting for 23% of the variance in communication knowledge. Four of the five dimensions of the CCCS were significant predictors in the regression model. The dimension that accounted for the most variance (16%) was presence cognitions ($F = 78.82$; d.f. $= 1,409$; $p < .01$). Modeling cognitions ($F = 8.50$; d.f. $= 2,408$; $p < .01$), reflection cognitions ($F = 7.98$; d.f. $= 3,407$; $p < .01$), and consequence cognitions ($F = 12.91$; d.f. $= 4,406$; $p < .01$) accounted for 2%, 2%, and 3% unique variance, respectively.

*H*2 was tested via a canonical correlation analysis (Rc) producing two significant canonical roots. The first root produced an Rc between the first (IIS) and second (CCCS) set of variables of .53 ($F = 35.51$; d.f. $= 406$; $p < .01$). The canonical loadings indicated that the first set was defined primarily by perceptiveness (.99). The second set was defined by presence cognitions (.81) and modeling cognitions (.77). The redundancy for set 1 given set 2 was 11% and set 2 given set 1 was 42%. The canonical correlation for the second root (.28) was also significant ($F = 11.69$; d.f. $= 405$; $p < .01$). The first set was defined by responsiveness (.92) and attentiveness (.55). The second set was defined by planning cognitions (.79) and reflection cognitions (.76). The redundancy for set 1 given set 2 was 3% and set 2 given set 1 was 28%.

*H*3 was tested by two stepwise multiple regressions with each of the dimensions of the revised self-monitoring scale (ability to modify self-presentation and sensitivity to the behaviors of the other) serving as the dependent variables and the dimensions of the CCCS serving as the independent variables. A significant multiple regression was produced ($R = .31$; $F = 42.54$; d.f. $= 1,409$; $p < .01$) with one CCCS dimension accounting for 9% of the variance in ability to modify self-presentation. Presence cognitions was the significant predictor in the regression model.

A second significant multiple regression was produced ($R = .47$; $F = 56.24$; d.f. $= 2,408$; $p < .01$) with CCCS dimensions accounting for 22% of the variance in sensitivity to the behaviors of the other. Modeling cognitions ($F = 76.44$; d.f. $= 1,409$; $p < .01$) accounted for 16% of the variance. Presence cognitions ($F = 30.52$; d.f. $= 2,408$; $p < .01$) accounted for 6 unique variance.

Discussion

The primary purpose of this study was to conceptualize and operationalize cognitive communication competence. Additionally, beginning the process of establishing the validity of the CCCS, its relationship to three established measures was assessed: the Knowledge Scale

(Spitzberg, 1990), the Revised Self-Monitoring Scale (Lennox & Wolfe, 1984), and the Interaction Involvement Scale (Cegala, 1981). These three constructs were chosen because they measure various cognitive abilities and processes predictive of skilled interpersonal performances. In general, the results were supportive of the conceptualization of cognitive communication competence and provide support for its validity. The following discussion will focus on three issues. Initially, the factor structure of the CCCS is discussed and compared with the Knowledge Scale. Secondly, the relationship of the CCCS with interaction involvement and self-monitoring is examined. Finally, suggestions for future research are provided.

Cognitive communication competence was conceptualized as a series of mental activities of a proactive and reflective nature. Individuals who are cognitively competent not only monitor social interaction during an encounter but also think about potential topics of conversation prior to the encounter and reflect upon their performance after an interaction. Thus, cognitive communication competence entails anticipating potentially influential contextual variables, monitoring the manner in which a conversation transpires, and reflecting upon one's performance for the purpose of eliminating unsuccessful communication tacts. In this manner cognitive competence is a cyclical process that leads to the continual refinement of one's social communication repertoire. The temporal sequence of communication cognitions is the focal point of the conceptualization presented here.

The results of the factor analysis of the CCCS (*RQ*1) are consistent with this broad conceptualization. Five factors emerged accounting for 57% shared variance with reliabilities ranging from .68 to .86.

(1) *Planning cognitions* reflect the anticipation, mental rehearsal, and monitoring of topics of conversation. It is measured by items such as: "Before a conversation I think about what I am going to say." "Before a conversation I practice what I am going to say." Two dimensions tap cognitions during an interaction, presence cognitions and modeling cognitions.

(2) *Presence cognitions* reflect an awareness of how the other is reacting to a conversation (e.g., "During a conversation I am aware of when it is time to change the topic," "During a conversation I pay attention to how others are reacting to what I am saying."

(3) *Modeling cognitions* reflect an awareness of contextual variables that provide information that serves to inform interaction choices (e.g., "When I first enter a new situation I watch who is talking with whom," "Generally, I study people.").

(4) *Reflection cognitions* tap a process of reflecting upon a performance with the objective to improve one's self-presentation (e.g., "After a conversation I think about what I said," "After a conversation I think about what I said to improve for the next conversation.").

(5) *Consequence cognitions* reflect a general awareness and concern for the effects of one's communication performance (e.g., "Generally, I think about how others might interpret what I say," "Generally, I think about the effects of my communication.").

These five dimensions represent a temporal sequence of communication cognitions that aid in the refinement of an individual's social repertoire.

A secondary purpose of this investigation was to begin the process of gathering support for the construct validity of the CCCS (See Figure 1). One construct chosen was communicative knowledge, which is conceptualized as knowing what to say and do in communication contexts (Spitzberg, 1990). Four of the five dimensions of the CCCS accounted for 23% of the variance

Duran and Spitzberg

in communicative knowledge. The primary predictor of knowledge was presence cognitions accounting for 16% of the variance. Also contributing to the model were modeling cognitions (2%), planning cognitions (2%), and consequence cognitions (3%). These results are encouraging in that although both the CCCS and knowledge scale are intended as operationalizations of the cognitive domain of communication competence they are not redundant measures. Communicative knowledge is a construct that primarily reflects cognitions during an interaction and, therefore, it is consistent that presence cognitions is the primary predictor of knowledge. It is also noteworthy that reflection cognitions was not a significant predictor in the regression model and although modeling, planning, and consequence cognitions were statistically significant they did not contribute meaningful variance. These results suggest that the CCCS measures different communication cognitions than those assessed by the knowledge scale.

The second construct selected was interaction involvement, which consists of three dimensions, responsiveness, perceptiveness, and attentiveness (Cegala, et al., 1982). Canonical correlation analysis was performed to assess the relationship between these dimensions of interaction involvement and CCCS. Two significant roots emerged. The first root was defined by perceptiveness (IIS dimension) and presence and modeling cognitions (CCCS dimensions). This association is conceptually consistent in that perceptiveness measures the consideration of other's perceptions and motives during an interaction. Presence and modeling cognitions also involve the monitoring of one's self-presentation as perceived by the other. Additionally, modeling cognitions also measure a tendency to observe others and contextual variables that may influence social interaction.

FIGURE 1. Graphic Representation of Significant Relationships
between CCCS Dimensions and Dependent Variables

CCCS	Self-Monitoring		Interaction Involvement			Communicative Knowledge
	Mod Pres	Senothr	Percep	Respon	Attent	
Plan				X	X	
Pres	X	X	X			X
Mod		X	X			X
Reflect				X	X	X
Conseq						X

Modpres = Ability to modify self-presentation; Senothr = Sensitivity to the behaviors of the other; Percep = Perceptiveness; Respon = Responsiveness; Attent = Attentiveness; Plan = Planning cognitions; Pres = Presence cognitions; Mod = Modeling cognitions; Reflect = Reflection cognitions; Conseq = Consequence cognitions

The second significant root was defined by responsiveness and attentiveness (IIS dimensions) and planning and reflection cognitions (CCCS dimensions). This association also is conceptually consistent. The two interaction involvement dimensions describe a communicator who is mentally involved in the interaction and is able to communicate appropriately. It appears this is accomplished by anticipating and mentally rehearsing topics of conversation and reflecting upon the performance after an interaction to refine one's communication repertoire. The relationship between IIS and CCCS further explicates the cognitive communication competence construct.

The final relationship investigated was between the revised self-monitoring scale (Lennox & Wolfe, 1984) and the CCCS. Self-monitoring consists of two dimensions: ability to modify

self-presentation and sensitivity to the behaviors of the other. Self-monitoring is an awareness of the other's perceptions and an ability to successfully adapt one's self-presentation to the requirements of the social context. Two separate multiple regressions were performed with each of the self-monitoring dimensions serving as the dependent variable and the CCCS dimensions serving as the independent variables. The presence cognitions dimension of the CCCS was significantly related to the ability to modify self-presentation accounting for 9% of the variance. This association is consistent in that the ability to modify self-presentation necessitates cognitions and behaviors during an interaction. Again, it is noteworthy that reflection cognitions was not a significant predictor in the regression model. Reflection cognitions would not be relevant during an interaction and, if so, only indirectly in as much as they serve to inform presence cognitions.

Modeling and presence cognitions accounted for 16% and 6%, respectively, of the variance in sensitivity to the behaviors of the other. Both of the CCCS dimensions generally reflect cognitions concerning salient contextual variables and about how successfully one's self-presentation is transpiring. Sensitivity to the other taps an awareness and consideration of the other's perceptions and feelings. The differential relationships observed between the CCCS dimensions and self-monitoring are conceptually consistent and provide additional support for the validity of the cognitive communication construct.

The three constructs utilized in this study provide initial support for the validity of the CCCS. However, all three constructs essentially measure cognitive communication concerns and abilities relevant to "on-line" interaction. That is, knowledge, interaction involvement, and self-monitoring are concerned with relevant cognitive processes during an interaction. A limitation of this study and, hence, a suggestion for future research is the necessity to employ communication constructs or research designs that take into consideration the temporal qualities of interaction. Cognitive complexity may be a useful construct to assess the validity of the CCCS, particularly planning and reflection cognitions. Cognitive complexity represents differential levels of sophistication in the ability to identify and differentiate interpersonal characteristics of people and contexts. These cognitive templates are used to predict how social contexts might transpire and, hence, inform communication choices and explain and provide meaning to interactions that have concluded. Therefore, it would appear that high cognitively complex communicators should have high scores on the dimensions of planning and reflection cognitions.

A second suggestion for future research entails the use of a research design that stimulates planning and reflection cognitions. Generally, individuals become most aware of their self-presentation when the social context is unique, salient, and/or unsuccessful. An experimental design that induces one or all of these perceptions should produce planning and reflection cognitions for those who are cognitively communicatively competent.

The results of this study provide support for the cognitive communication competence construct. The five factors that emerged corresponded with the critical components of the conceptualization. The most notable feature is the acknowledgment of the temporal sequence of communication cognitions—cognitive considerations prior to, during, and after social interactions. The CCCS assess a cyclical model of communication cognitions that contributes to the development and refinement of an effective social repertoire.

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Appendix A

Directions: The following are statements about the communication process. Answer each as it relates to what you generally think about concerning social situations. Please indicate the degree to which each statement applies to you by placing the appropriate number (according to the scale below) in the space provided.

> 5 = Always true of me
> 4 = Often true of me
> 3 = Sometimes true of me
> 2 = Rarely true of me
> 1 = Never true of me

Planning Cognitions

_____ 1. Before a conversation I think about what people might be talking about.
_____ 2. Before a conversation I mentally practice what I am going to say.
_____ 3. Before a conversation I think about what I going to say.
_____ 4. When I first enter a new situation I think about what I am going to talk about.
_____ 5. During a conversation I think about what topic to discuss next.

Modeling Cognitions

_____ 6. When I first enter a new situation I watch who is talking to whom.
_____ 7. When I first enter a new situation I try to "size up" the event.
_____ 8. Generally, I study people.
_____ 9. Generally, I am aware of people's interests.

Presence Cognitions

_____ 10. During a conversation I am aware of when a topic is "going nowhere."
_____ 11. During a conversation I am aware of when it is time to change the topic.
_____ 12. During a conversation I pay attention to how others are reacting to what I am saying.
_____ 13. During a conversation I know if I have said something rude or inappropriate.

Reflection Cognitions

_____ 14. After a conversation I think about what the other person thought of me.
_____ 15. After a conversation I think about my performance.
_____ 16. After a conversation I think about what I said.
_____ 17. After a conversation I think about what I could have said.
_____ 18. After a conversation I think about what I have said to improve for the next conversation.

Consequence Cognitions

_____ 19. Generally, I think about how others might interpret what I say.
_____ 20. Generally, I think about the consequences of what I say.
_____ 21. Generally, I think about how what I say may affect others.
_____ 22. Generally, I think about the effects of my communication.