

The Interactive Media Package for Assessment of Communication and Critical Thinking (IMPACCT[©]): Testing a Programmatic Online Communication Competence Assessment System

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IMPACCT is an online survey covering over 40 self-report types of student communication competency, as well as a test of critical thinking based on cognitive problem-solving. The student nominates two peers who rate the student's interpersonal, computer-mediated, group and leadership, and public speaking communication competence. The student takes the self-report survey at Time 1 (T1), and also at a Time 2 (T2). The system generates a printable profile for the student displaying the following percentiles: (a) T1-Self (i.e., how the student sees self's communication skills in various skill domains at time 1), (b) T2-Self (i.e., how the student's scores changed from T1 to T2), (c) Peers (i.e., how self-rated skills compare to averaged ratings by two peers nominated by the student), and (d) Norms (i.e., how self-rated skills compare to everyone else's self-ratings who has taken the survey). The resulting collective data are available to the department to provide evidence of student self-perceived skill deficits at T1, as well as perceived change from T1 (e.g., beginning of course or major) to T2 (e.g., end of course or major), providing quantifiable data for assessment accounting and reporting. The system was tested on a basic course sample of 1,880 freshmen basic course students and 1,999 affiliated peer raters using a new measure of communication competence developed for this project. All subscales were sufficiently reliable. The self-reported motivation,

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knowledge, and skills constructs accounted for between 68–72% of student self-perceptions of overall communication competence (i.e., appropriateness, effectiveness, clarity, attractiveness, satisfaction). Critical thinking was unrelated, and peer ratings were only modestly related, to student self-perceptions of communication competence. Student self-perceived skills were systematically lower than peer ratings of students. Students consistently perceived that their communication competence and skills increased significantly over the span of the semester. The system is highly scalable and adaptable to multiple curricular configurations, and shows promise in providing a practical solution to departmental assessment needs. The measure also provides a valuable architecture for significant research and theory development in the area of communication competence.

Keywords: Assessment; Basic Course; Communication Competence; Communication Skills; Evaluation

Communication skills are predictive of success in careers, personal relationships, and individual health and well-being (Morreale, Osborn, & Pearson, 2000; Spitzberg & Cupach, 2002; Waldron & Lavitt, 2000), yet there is little consensus regarding how such skills should be assessed (Larson, Backlund, Redmond, & Barbour, 1978; Spitzberg, 2003). This presents an unusual quandary; communication skills are known to be important, but it is not clear what communication skills actually are, or which specific skills are most important. There is increasing pressure to identify what communication skills are, and more specifically, to demonstrate that: (a) the communication discipline has a set of communication skills that represent its core competencies; (b) the communication discipline is able to assess these skills reliably and validly, and (c) the communication discipline can effectively train its students in ways that improve their skills in these core competencies. The project reported here seeks to demonstrate a viable assessment approach that is conceptually sound, scalable, efficient to administer, and demonstrably valid for both basic research and pedagogical needs.

Communication assessment has developed and matured . . . and become institutionalized at virtually every level of education. State legislatures mandate it, accrediting bodies require it, professional educational associations support it, and teachers have begun to think it is a good idea for their students. (Backlund & Arneson, 2000, p. 88)

There is no shortage of approaches to conceptualizing, categorizing, or assessing communication skills (Breen, Donlon, & Whitaker, 1977; Byram, 1997; Greene & Burleson, 2003; Hargie, 1997; Hasler, 2009; Klemp, 2001; McClelland, 2001; Morreale, 2009; Raven, 2001; Spitzberg, 2003), and more approaches are beginning to embrace new media, online methodologies, and laboratory contexts in the administration of such assessments (e.g., Bakx, Sijsma, Van Der Sanden, & Taconis, 2002; Ellis, Shockley-Zalabak, & Hackman, 2000; Hasler, 2009). There are few if any approaches to date that have been widely adopted in the communication discipline, in part, because of the unique features of any given communication department and curriculum (Dannels & Gaffney, 2009). Given the pressures to provide quantifiable evidence

of student performance and gains, there is a significant need for developing and validating assessments of student communication skills that are efficient, scalable, adaptable, convenient, and valid.

A complete review of relevant assessment issues is beyond the scope of the current project. Several surveys of these problems, however, have identified a number of problems facing the assessment of interpersonal competence (Curran, 1979; Inderbitzen, 1994; Larson, 1978; Larson et al., 1978; Lustig & Spitzberg, 1993; Moore, 1994; Rubin, Daly, McCroskey, & Mead, 1982; Spitzberg, 1987, 1988, 2003; Spitzberg & Cupach, 1989). Many of the issues involve relatively standard *topoi* in the field of psychometrics and measurement development.

Basic research endeavors have been consistently hampered by a lack of common assumptions, and a lack of well-validated measures of competence. Concerns have been both voiced and evidenced regarding the *validity and reliability* (Bain, 1991; Duran & Spitzberg, 1995; Flanagan, Alfonso, Primavera, Povall, & Higgins, 1996; O'Neil, Allred, & Dennis, 1997; Spitzberg, 1990; Storey, 1996), *factor and dimensional structure* (Galeazzi, Franceschina, & Holmes, 2002; Spitzberg, Brookshire, & Brunner, 1990), and *generalizability* (Curran et al., 1980; Spitzberg & Cupach, 1985; St. Lawrence, Hughes, Goff, & Palmer, 1983; Sypher & Sypher, 1984) of existing measures and assessment approaches. Reviews have identified well over 150 measures intended to assess interpersonal competence or significant component(s) of interpersonal competence (Spitzberg & Cupach, 1989, 2002; Spitzberg, 2003), and over 100 skill labels or factors have been attributed to interpersonal competence (Spitzberg & Chagnon, 2009; Spitzberg & Cupach, 1989, 2002). In the context of such a diverse and fragmented conceptual and methodological landscape, it is difficult to know how to best approach the need to develop a comprehensive assessment that will serve both pedagogical as well as theoretical needs.

At least since the advent of intelligence testing (Thorndike, 1920), there has been interest in assessing a broad range of communicative abilities that might comprise a person's social intelligence. The concept of social intelligence evolved in variegated ways, and eventually evolved into contemporary conceptions of communicative competence (see Spitzberg, 2003; Spitzberg & Cupach, 1984). Integrative models have been proposed that may provide a conceptual and methodological architecture for a comprehensive approach to assessing communicative competence (Spitzberg & Chagnon, 2009). A common integrative conative model proposes that competence is a subjective evaluation of communication quality that is a probabilistic function of a communicator's motivation, knowledge, and skills (Dillard & Spitzberg, 1984; Morreale, 2009; Spitzberg, 2000, 2009a, 2009b; Spitzberg & Cupach, 1984). Motivation concerns the approach and avoidance orientation to communication. Knowledge includes the cognitive content and procedural dynamics of action assembly. Communication skills are the repeatable goal-oriented action sequences involved in message production and interaction. Such a model provides a flexible conceptual framework within which assessment projects can be organized.

IMPACCT and Its Development

The IMPACCT was developed explicitly to provide a procedure that would simultaneously meet administrative assessment needs, demonstrate reasonable psychometric validity, and provide pedagogical value for students and instructors. It is an online survey of communication skills with a section on critical thinking. At Time 1 a student registers a personal account on the survey site and provides the e-mail addresses of two people (“peers”) who know the student well. Students then respond to an extensive survey in which they rate their own communication competence in a wide variety of contexts. Also at Time 1, the peer raters are e-mailed an abbreviated version of the same survey, and they rate the student’s communication skills in content domains parallel to the student’s own self-rated competencies. At a Time 2, such as at the end of a given course or senior year, students sign back into their survey account and take the self-evaluation survey again. The items of the survey are then scored as percentiles along a number of communication abilities, and the ratings of the two external peers nominated by the student are averaged and scaled along the same abilities as the student’s self-ratings (often referred to as a 360° rating; e.g., Thammasitboon et al., 2008).

These procedures produce four assessment profiles for each student: (a) a *self*-rating, (b) a *normative* self-versus-everyone rating (i.e., everyone who has ever taken the survey), (c) a *peers* 360°-type peer rating, and (4) a *change* analysis involving a Time1-versus-Time2 rating. After all assessments are completed, students can log into the site and receive their personal scores in a “profile” sheet that can be printed and included in a portfolio. The academic department can also retrieve systematic program-wide data on the communication abilities of its students, as well as the performance of its courses and students in the major. Because the assessment involves knowledgeable peer ratings, it is not inherently limited by the constraints of self-report methods, and because it has both Time 1 and Time 2 assessments, it is capable of registering perceived changes in skills that may reflect the effectiveness of pedagogical intervention. Because of its self-administered online format, it is efficient and flexible in its capacity for ongoing research validation. This study reports the initial investigation of the performance of this system in a large basic course for freshmen at a large public university.

Methods

Participants and Procedures

The assessment project was implemented at a large southwestern public university. The basic communication course is taught as a ‘hybrid’ format (i.e., covering interpersonal, group, and public communication contexts) in four to five mass lecture sections, and then the students distribute to sections taught by graduate teaching associates for two additional meetings a week. Virtually all freshmen at the university are required to take the course as part of their general education requirements. The survey was announced in the second week of the 15-week semester, and students were

given an initial deadline of the subsequent week. Because an unanticipated incompatibility between the architecture of the electronic course management system (i.e., Blackboard) and IMPACCT, dozens of students who attempted to access IMPACCT through their course management system experienced problems. The deadline for survey completion was extended into the fourth week of the semester. Peer raters were expected to populate the survey at a lagging but progressively smaller rate.

In the Fall 2009 semester, 1,880 students participated in the IMPACCT survey, with 472 (25.1%) males and 1,408 (74.9%) females. Of these, 203 (10.8%) self-classified themselves as Asian, 66 (3.5%) as Black or African American, 750 (39.9%) as White, Anglo or European American, 411 (21.9%) as Hispanic, Latino/a or Mexican American, 22 (1.2%) as Middle Eastern, 69 (3.7%) as Pacific Islander, 3 (0.2%) as Native American, 113 (6.0%) as mixed ethnicity, 42 (2.2%) as “prefer no label,” and 201 (10.7%) not responding. The average age of students was 18.05 ($SD = 1.56$, range 16–53). There were 1,017 peers in the first nomination slot who participated, and 982 in the second nomination slot who participated. Due to incomplete data files, not all of these represent paired peer raters; that is, many students had only one nominated peer rater, and many students never obtained compliance from either of their nominated raters. For example, 1,506 students completed all items of Time 1 of the Conversational Skills Rating Scale (CSRS), 1,332 completed all of the Time 2 CSRS items, and 1,018 first-nominated and 986 second-nominated peers provided an assessment of the student’s interpersonal skills, with 885 students with both a Time 1 and a Time 2 peer satisfactorily rating the student on this measure. Approximately 622 students provided complete data for Time 1, Time 2, and both peer assessments.

Technical Background

The creation and development of IMPACCT required multiple sets of assessment expertise as well as programming capabilities. Several software programs were used in the construction of the website, the registration process, the e-mail-linking function for peer raters, the programming of reminder messages and password reminders, as well as the animation and mouse-sensitive critical thinking items. The back end of IMPACCT was programmed in PHP scripting language using Adobe Dreamweaver and integrated with a MySQL database, running on a UNIX hosting environment, using an Apache webserver. The interface and visual components of the assessment were designed in Adobe Photoshop. The interactive components were built using ActionScript 2.0 in the Adobe Flash authoring environment. Adobe DreamWeaver was used to build the back end of the site environment for administratively integrating the item contents and survey functions. A professional website developer was employed to translate the conceptual framework and content of the author into a workable assessment tool, and three small beta tests, and one larger pilot test were required to manage the multiple ‘bugs’ that emerged from actual student usage. The resulting data are saved on a server, and can be administratively downloaded into a set of Excel files, all containing a system-assigned student ID number, which permits aggregation of the files as needed.

Measurement

The initial development of IMPACCT began with one well-established measure (CSRS; Spitzberg, 1994, 2007b) and another that had received investigation in one prior study (Spitzberg, 2007a). The remaining constructs were developed for this project to assure representation of a set of conceptual competency domains representative of the discipline. One conceptual domain was critical thinking and general semantics.¹ The other conceptual domains were based on areas of coursework commonly represented in the discipline of communication (i.e., intercultural, group process, public speaking).

Critical thinking. Critical thinking has been conceptualized and assessed in a wide variety of ways (Cheung, Rudowicz, Kwan, & Yue, 2002). Its cognitive skill component can be understood in terms of “interpretation, analysis, inference, evaluation, explanation and self-regulation” (Rimiene, 2002, p. 17). Students tend to experience critical thinking in terms of evaluating simple comparisons, seeing from multiple perspectives, reflecting back on something, and seeing beyond what is there (Phillips & Bond, 2004). Critical thinking was assessed in the IMPACCT through nine interactive problem-solving situations intended to represent social and symbolic perception issues. These problems were derived from common intellectual and semantic puzzles. For example, the question “How many animals of each species did Moses take aboard the ark with him?” had multiple answer possibilities (0, 1, 2, Infinite). The correct answer of “0” is often missed because the symbols ‘Moses’ and ‘ark’ elicit common cultural narrative schemata that then lead to a process of jumping to the conclusion of the answer ‘2.’ Instead, students who realized that “Noah,” and not “Moses,” was the character associated with the ark narrative, would see a ‘pop-up’ form of general semantics feedback after answering. The feedback explained how well they performed by avoiding the mistake of operating from inferences rather than facts. The ‘9-dot’ problem, in which nine dots are arranged in three equidistant rows of three dots, was presented such that if the outer dots were connected it would appear like a square. Participants were asked to roll their mouse from the lower left dot, and draw four continuous straight lines connecting all nine dots. Students who missed this were given feedback on the general semantics principle that “the map is not the territory,” and that most people who fail to solve the problem perceive the nine dots as a square or box that somehow constrains their ability to move the mouse ‘outside the box’ to solve the problem. Thus, across nine such cognitive puzzles, students received feedback on how they answered the item correctly or incorrectly.²

Conversational Skills Rating Scale (CSRS). The CSRS was developed in its initial form in 1987 (Spitzberg & Hurt, 1987), and used and validated extensively since (Spitzberg, 2007b). As applied in this study, it consisted of the core 25 relatively molecular behavioral items, intended to assess four skill areas: attentiveness (e.g., “asking questions,” “encouragements or agreements (i.e., encouraged partner to talk)”; composure (e.g., “expression of personal opinions (i.e., neither too passive nor

aggressive),” “shaking or nervous twitches (i.e., weren’t noticeable)”); coordination (e.g., “speaking fluency (e.g., avoided pauses, silences, ‘uh,’ etc.),” “initiation of new topics”); expressiveness (e.g., “vocal variety (i.e., avoided monotone voice),” “facial expressiveness (i.e., neither blank nor exaggerated”). The rating scale was adapted to a 7-point scale, ranging from “extremely below average skill,” to “extremely above average skill” compared “to typical conversationalists.”

Interpersonal competence. A total of 23 separate skill clusters and contexts were assessed. Most of these items were adapted from the experimental study by Spitzberg (2007a), in which different interpersonal competence items and subscales were found to be equivalent across three different types of rating scales. The constructs were selected because of their representation in existing established measures of interpersonal competence (i.e., Communicative Functions Questionnaire; Burleson & Denton, 1997; Burleson & Samter, 1990; Interpersonal Communication Competence measure; Bubaš & Lovrenčić, 2002; Communicative Adaptability Scale; Duran, 1992; Social Skills Inventory; Riggio, 1986). Items were generated anew for the major contexts and constructs reflected in these measures, and relabeled into intuitive or common curricular topic categories. The most reliable composites from the Spitzberg (2007a) study were retained, with some minor revisions, and a few new constructs were added. The resulting 69-item measure of interpersonal competence is described briefly below. The rating scale for all of the 69 items was identical to that provided for the CSRS (e.g., “Compared to typical conversationalists I encounter, I am . . . [below average-to-above average] . . .”).

Small talk was assessed by two items (e.g., “at chatting with a diverse range of people,” “at engaging in casual conversation with others”).³ The remaining subscales were each assessed by three items. *Conversation* reflected general social interaction ability (e.g., “at conversation with others,” “at carrying on conversation”). *Meaning* assessed ability to achieve mutual understanding (e.g., “at making my intentions clear when I speak,” “at getting others to understand what I’m saying”). *Disclosure* represented the ability to open up to others appropriately (e.g., “at letting others know who I am,” “at revealing myself to others”). *Initiation* was the ability to begin interactions (e.g., “at beginning a conversation with a stranger,” “at introducing myself to others”). *Opening* reflected the ability to get other people to disclose self-relevant information (e.g., “at getting others to disclose themselves to me when I want to get to know people,” “at getting others’ to open up to me”). *Empathy* was the ability to read and understand others emotional states (e.g., “at understanding others’ feeling when I’m interacting with them,” “at interpreting other’s emotions correctly”). *Deception detection* was assessed as the ability to correctly see through others’ false representations (e.g., “at telling if someone is lying to me,” “at detecting others’ deceptions”). *Listening* was assessed as an ability to attend to and remember what others say (e.g., “at listening to others,” “at recalling and using details conversational partners say in my own conversation”). *Support* was viewed as the provision of needed confirmation or interactional assistance (e.g., “at providing the support others need when others talk about their troubles,” “at providing sympathy”). *Face management* was assessed in

terms of supporting other's preferred identities in interaction (e.g., "at letting others 'be themselves' during conversation," "at conversing with others so they feel I respect them"). *Immediacy* was referenced by items referring to warmth and intimacy (e.g., "at telling those I'm close to how I feel about them," "at showing warmth and closeness when I converse with others"). *Narrative* skills concerned the ability to tell and use stories in interaction (e.g., "at retelling my experiences in the form of entertaining stories," "at turning the little things in life into interesting stories"). *Humor* was operationalized as the ability to use wit, jokes, and laughter (e.g., "at telling a good joke," "at contributing laughter and humorous conversation"). *Secrecy* was assessed in terms of an ability to maintain appropriate levels of privacy (e.g., "at keeping secrets from others," "at revealing only what I want to reveal in interactions"). *Persuasion* was assessed as an ability to achieve interactional goals (e.g., "at getting someone to do something I want," "at persuading others"). *Regulative* ability was conceptualized as the ability to influence or comment on others' interactional actions (e.g., "at providing criticism in constructive ways," "at politely letting others know when they've said or done something wrong"). *Collaboration* skills represented the ability to reach constructive conflict outcomes (e.g., "at finding win-win solutions in disagreements," "at maintaining a cooperative climate during differences of opinion"). *Assertion* reflected an ability to confidently express personal opinions and goals (e.g., "at confronting others with my opinions," "at being assertive in conversation"). *Intercultural* competence was represented as the ability to interact skillfully across compositions of groups (Spitzberg, 1989; e.g., "at understanding others with diverse cultural or ethnic backgrounds," "at getting along with others who come from very different backgrounds than my own"). *Group* competence was assessed as the ability to manage small collective interactions (e.g., "at interacting with others in groups," "at engaging in cooperative actions during group interaction"). *Adaptability* was operationalized as the ability to adjust interactional behavior to the actions of others (e.g., "at changing my behavior to fit the situation," "at paying attention to cues about how to behave from one situation to the next").

Computer-mediated communication (CMC) competence. CMC has been conceptualized as "any human symbolic text-based interaction conducted or facilitated through digitally based technologies" (Spitzberg, 2006, p. 630), so competence in CMC is the appropriate and effective use of such technologies for communication. This competence is expected to result from motivation, knowledge, and skills in using such technologies (Spitzberg, 2006). A preliminary measure of CMC competence developed by Spitzberg (2006) was adapted for use in the IMPACCT. The a priori subscales were developed to mirror prior research and conceptualization of interpersonal competence, but as they would apply to a mediated context (Spitzberg, 1983, 2000, 2009a; Spitzberg & Brunner, 1991; Spitzberg & Cupach, 1984, 2002). This part of the survey was introduced by the following phrasing:

People differ quite a bit in terms of how skilled they are at using computers (including instant messaging, e-mail, blogs, MOOs, MUDs, etc.) in communicating and conversing with others. For the following statements, we would like you to estimate, *compared to*

typical conversationalists you encounter, how skilled you are in using *computer-mediated communication* (i.e., CMC).

Respondents used a 7-point response scale ranging from “Not at all true of me,” to “Very true of me,” with each anchor point referenced with an intermediate phrase.

CMC motivation was assessed by five items reflecting positive and negative inclinations to use CMC (e.g., “I enjoy communicating using computer media,” “I am nervous about using the computer to communicate with others”—reverse-scored). *CMC knowledge* was operationalized by five items representing familiarity and expertise with such media (e.g., “I am very knowledgeable about how to communicate through computers,” “I am very familiar with how to communicate through e-mail and the Internet”). *CMC efficacy* was conceived as an intersection of confidence and ability to use computerized media for communication, and assessed by eight items (e.g., “I don’t feel very competent in learning and using communication media technology”—reverse-scored; “I quickly figure out how to use new CMC technologies”). *CMC coordination*, assessed by four items, was envisioned as the ability to manage timing and turn-taking in mediated environments (e.g., “I know when and how to close down a topic of conversation in CMC dialogues,” “I am skilled at timing when I send my responses to people who e-mail me”). *CMC attentiveness* was measured by four items as an ability to demonstrate attention to, concern for, and interest in others through digital media (e.g., “I show concern for and interest in the person I’m conversing with in CMC,” “I take time to make sure my e-mails to others are uniquely adapted to the particular receiver I’m sending to”). *CMC expressiveness* was viewed as the ability to animate or enliven mediated interactions, and defined by four items (e.g., “I am very articulate and vivid in my CMC messages,” “I try to use a lot of humor in my CMC messages”). *CMC composure* was measured by six items reflecting assertiveness and intentionality of mediated interactions (e.g., “I display a lot of certainty in the way I write my CMC messages,” “I am skillful at revealing composure and self-confidence in my CMC interactions”). *CMC adaptability* was operationalized by 11 items assessing selectivity in using different media with different audiences, introduced by the phrase:

I choose which medium (i.e., computer, phone, face-to-face, etc.) to communicate based on . . . , followed by items such as “. . . how quickly I need to get a message out to people,” “. . . how much access the person I need to communicate with has to the medium,” and “. . . how personal or intimate the information in the message is.”

Group and leadership competence. Functional approaches to group interaction often identify a variety of vital group communication functions (Barge, 1989), and these provided a conceptual guide for formulating items representing an ability to manage groups toward constructive process and outcomes. This part of the survey was introduced by the following:

You probably have at some time or another been a member of a task-based group that was assigned to solve a problem or develop a product or report. What follow are statements that may or may not describe your attitudes and abilities in contributing and communicating in such a group.

The response scale was the same 7-point “Not At All True of Me” to “Very True of Me” as used in the CMC measure.

In this survey group-leadership competence was operationalized by 15 items reflecting a range of group role performance functions (e.g., “I am able to help the group define the problem, or what it needs to accomplish,” “I am able to come up with creative ideas for potential solutions or alternatives,” “When comments diverge from the task, I am helpful in bringing it back to the task,” “I am good at keeping conflicts constructively focused on ideas rather than on people or personalities”).

Public speaking competence. As part of a systematic effort to develop broadly applicable and valid assessments of public speaking competence, Morreale and colleagues (Morreale, Johnson, & Hackman, 1991; Morreale, Morley, & Naylor, 1991) constructed an instructor-based assessment of public speaking quality. This framework was translated into self-report items reflecting most of the key elements of their assessment. This measure was introduced by the following instructions:

You probably have at some time or another given a speech or made a presentation to a group or audience, even if it is a presentation to a class or an extracurricular group. You may have made much more formal presentation or given a more elaborate speech at some kind of function (e.g., speech class, debate class, Rotary Club contest, presentation to an employer, etc.). What follow are statements that may or may not describe your attitudes and abilities in making such presentations.

The items were responded to by the same 7-point “Not At All True of Me” to “Very True of Me” scale. The first five items were intended to assess public speaking motivation (e.g., “speaking in public makes me nervous”—reverse scored, “I can confidently get up and speak spontaneously to a group of people”). The subsequent 26 items represented various functions and features of competently developed speech design and performance (e.g., “I am good at coming up with an interesting and appropriate topic for a speech,” “I make sure I have at least a few main points to get across to my audience,” “I use good grammar in my oral presentations,” “I use vivid and appropriate gestures when making oral presentations”).

Communication quality. Communication competence has been conceptualized as a judgment of quality, and quality is most commonly evaluated along relatively standard *topoi* or dimensions (Spitzberg, 1987, 2000, 2009a). Five criteria domains of communication competence evaluation were assessed. *Appropriateness* refers to the relative legitimacy of behavior in a given interaction context. In this survey it was assessed by four items (e.g., “I avoid saying things that might offend someone,” “I pay as much attention to the WAY I say things as WHAT I say”). *Effectiveness* refers to the ability to achieve relatively preferable outcomes in communication contexts. It was assessed by four items (e.g., “I generally get what I want out of interactions,” “I am effective in my conversations with others”). *Clarity* refers to related achievements concerned with expression, getting meanings across and mutual understanding (Powers & Spitzberg, 1986). It was operationalized by four items (e.g., “I get my ideas across clearly in conversations with others,” “I feel understood when I interact with others”). *Satisfaction* represents a feeling of having fulfilled positive expectancies in

interaction (Spitzberg & Hecht, 1984), and was assessed by four items (e.g., “I am generally satisfied with my communication encounters,” “I enjoy my interactions with others”). *Attractiveness* represents the ability of an interactant to get others to have relatively positive impressions of the interactant (e.g., “If I can engage someone in conversation, I can usually get them to like me,” “People generally enjoy my company when interacting with me”).

Peer competence ratings. When a student registers into the IMPACCT system, the student provides the e-mail addresses of two individuals who have had the opportunity to observe the student communicate in a wide variety of circumstances, and could provide reasonable feedback about the student’s communication behavior. These “peers” were automatically sent an introductory statement explaining that their assistance is requested by an acquaintance of theirs who needed their participation for a school assignment. Upon activating the link in the introductory message, peers were taken to a survey site with a few demographic and informational items, and then 45 items in which the peers rated the competence of the student. These data were then automatically merged by the IMPACCT system and matched with the student, based on correspondence of the e-mail address and the student’s registration ID. The competence items were introduced with the instruction: “Based on my conversations with this student, and/or my observations of this person’s communication, I would consider this person’s communication to be . . .” This was followed by a 7-point rating scale corresponding to the scale used for the CSRS, ranging from “Extremely Below Average” to “Extremely Above Average.” It was decided to ask the students what their relationship was to the peer, but not to preselect the nature of that relationship for the student. Whether or not different types of peers produce systematically different types of evaluations is an empirical question, so it was decided to collect a variety of such data points so that future research could determine the advisability of predetermining types of peer raters.

The first four items of this measure were intended to assess *peer-rated molar competence impression* (e.g., “at being highly motivated,” “at being highly knowledgeable,” “at engaging people skillfully through conversation,” and “at making the best possible impression through conversation”). *Peer-rated interpersonal competence* was assessed by 23 items written to correspond with one item per skill cluster in the student self-rating of interpersonal competence (e.g., small talk: “at managing ‘small talk’ competently; support: “at providing social or emotional support to others,” persuasion: “at getting others to do what she or he wants”). *Peer-rated CMC competence* was operationalized by six items (e.g., “at using new media technologies competently in communicating with others,” “at getting his/her meanings across when using new media technologies”). *Peer-rated group and leadership competence* was assessed by six items (e.g., “at managing interactions in groups competently,” “at keeping conflicts constructively focused on ideas rather than on people or personalities”). *Peer-rated public speaking competence* was measured by six items (e.g., “at avoiding anxiety or nervousness when speaking in public,” “at providing entertaining aspects to his/her public speeches”).

Results

Given the number of variables, only a select number of analyses can be reported. This report will focus on basic psychometrics (sans factor analyses⁴), issues of bias, and criterion validity, with the intent of demonstrating the basic feasibility and potential value of the assessment approach.

Reliability

The CSRS and portions of most of the interpersonal items had been investigated previously (Spitzberg, 2007a, 2007b), but the remainder of the survey items were new and untested. Many of the subscales had minimal margin for error, considering that many of the constructs consisted of only three to six items. As Table 1 displays, the a priori constructs performed excellently overall, with 53 of 55 constructs producing reliabilities greater than .70. Critical thinking, consisting of nine cognitive and semantic puzzles and problems, produced a marginally acceptable reliability of .67, and CMC motivation at Time 2 produced unacceptable reliability of .61, but it was retained to assure consistency with the item composition of its Time 1 items.

Correspondence of Student and Peer Ratings

A key element of IMPACCT is the avoidance of an exclusive reliance on student self-perceptions. There is often minimal correspondence between an interactant's self-perception of competence and the perceptions of other persons evaluating that interactant's competence (e.g., Cupach & Spitzberg, 1983; Spitzberg, 1987). Studies indicate correlations between .40 and .50 between an interactant's self-assessment and others' evaluations (Kenny, 1994; Ready, Clark, Watson, & Westerhouse, 2000). In this study, correlations ranged from .00 to .33 (see Table 2). Many of these were statistically significant, although most effect sizes were small. The correlations between the two peers also revealed small but generally statistically significant intercorrelations, ranging from .05 (ns) to .27.

Ratings Biases

The problem of *bias* is a concern of any assessment system that will be used for both basic research and pedagogical assessment. There are numerous types of bias, but two that have potentially potent implications for the instructional context are ethnicity and biological sex. Simple mean differences of all constructed variables were investigated. For the ethnic groups, only the self-identified categories of Asians, Whites, Blacks/African Americans, and Hispanics/ Latino(a)s were retained for analysis, given the small sample sizes in the other ethnic categories.

Out of 99 contrasts, only one contrast achieved significance $p < .01$ (Time 2, Humor), which, given the number of contrasts, would be expected by chance. In no instance did the effect size of the difference across ethnic categories account for more than 1.5% of the variance, and only two contrasts accounted for 1% or more of the

Table 1 Coefficient alpha reliability of major a priori constructed measures

Scale	No of items	T1	T2
<i>Critical Thinking Ability</i>	9	.67	
CSRS/Conversational Skills Rating Scale (Aggregate)	25	.94	.95
Attentiveness Skills (a priori)	7	.87	.90
Composure Skills (a priori)	6	.80	.80
Coordination Skills (a priori)	6	.88	.89
Expressiveness Skills (a priori)	6	.82	.85
Interpersonal Skills (Aggregate)	69	.98	.98
Small Talk Skills	2	.87	.89
Conversation Skills	3	.89	.91
Meaning Skills	3	.92	.92
Self-Disclosure Skills	3	.92	.92
Initiation Skills	3	.93	.92
Opening Skills	3	.92	.92
Empathy Skills	3	.91	.91
Deception Detection Skills	3	.92	.92
Listening Skills	3	.87	.89
Social Support Skills	3	.93	.93
Face Management Skills	3	.86	.97
Immediacy Skills	3	.91	.92
Narrative Skills	3	.91	.91
Humor Skills	3	.87	.89
Secrecy (Privacy Management) Skills	3	.81	.85
Persuasion Skills	3	.93	.93
Affect Regulation Skills	3	.79	.86
Regulative Skills	3	.80	.83
Collaboration (Conflict) Skills	3	.89	.91
Assertion Skills	3	.90	.91
Intercultural Skills	3	.92	.92
Group Management Skills	3	.91	.91
Adaptability Skills	3	.91	.91
CMC Skills (Aggregate)	50	.96	.96
CMC (Aggregate)	40	.95	.96
CMC-Motivation	5	.73	.61
CMC-Knowledge	5	.87	.87
CMC-Efficacy	8	.84	.82
CMC-Coordination Skills	4	.85	.88
CMC-Attentiveness Skills	4	.87	.89
CMC-Expressiveness Skills	4	.82	.84
CMC-Composure Skills	6	.94	.94
CMC-Adaptability Skills	12	.93	.94
Quality/Competence (Aggregate)	20	.95	.96
Appropriateness Outcomes	4	.83	.84
Effectiveness Outcomes	4	.93	.93
Clarity Outcomes	4	.89	.91
Satisfaction Outcomes	4	.93	.94
Attraction Outcomes	4	.92	.92
Group/Leadership Skills	15	.90	.93
Public Speaking Motivation	5	.85	.80
Public Speaking Skills	26	.97	.97
Peers	No of items	Peer1	Peer2
Peer (Aggregate)	45	.95	.96
Peer (Molar Competence)	4	.82	.84
Peer: Interpersonal Skills	23	.91	.94
Peer: CMC Skills	6	.89	.88
Peer: Group/Leadership Skills	6	.89	.91
Peer: Public Speaking Competence	6	.94	.94

Table 2 Correlations of Time 1 self-reported assessments with peer-reported assessments, and correlations among the individual and averaged peer ratings (minimum $n \cong 738 - 976$)

	P1-ICC	P1-Group	P1-CMC	P1-Public	P2-ICC	P2-Group	P2-CMC	P2-Public	P1P2-ICC	P1P2-CMC	P1P2-Group	P1P2-Public
CRITTHNK	-.004	.037	.000	.004	.035	.073*	.008	.017	.025	.006	.083*	.026
T1CSRS	.177**	.132**	.039	.176**	.193**	.131**	.090**	.185**	.226**	.064	.183**	.240**
T1INTCOMP	.299**	.191**	.097**	.178**	.223**	.123**	.127**	.147**	.327**	.145**	.226**	.229**
T1CMCAGG	.120**	.077*	.134**	.036	.087*	.027	.119**	.019	.123**	.164**	.074*	.036
T1GROUPLDR	.291**	.198**	.048	.164**	.201**	.101**	.103**	.125**	.304**	.076*	.208**	.190**
T1PUBMOTIV	.114**	.106**	.057	.264**	.091**	.097**	.018	.247**	.137**	.040	.148**	.341**
T1PUBSKILLS	.234**	.145**	.074*	.202**	.191**	.111**	.079*	.205**	.255**	.091*	.172**	.275**
T1QUALITY	.271**	.160**	.071*	.127**	.171**	.079*	.072*	.112**	.276**	.086*	.174**	.166**
P1ICC	1.000											
P1GROUP	.695**	1.000										
P1CMC	.466**	.393**	1.000									
P1PUBLIC	.462**	.523**	.315**	1.000								
P2ICC	.265**	.185**	.083*	.121**	1.000							
P2GROUP	.163**	.155**	.071*	.100**	.654**	1.000						
P2CMC	.144**	.118**	.134**	.094**	.518**	.449**	1.000					
P2PUBLIC	.140**	.136**	.046	.206**	.483**	.494**	.375**	1.000				
P1P2ICCC	.784**	.552**	.343**	.369**	.806**	.520**	.418**	.391**	1.000			
P1P2CMC	.411**	.341**	.757**	.278**	.394**	.348**	.749**	.275**	.505**	1.000		
P1P2GROUP	.568**	.754**	.303**	.414**	.554**	.766**	.379**	.412**	.705**	.453**	1.000	
P1P2PUBLIC	.398**	.439**	.239**	.780**	.381**	.375**	.297**	.773**	.489**	.356**	.534**	1.000

Note. T1; T2 Time 2; P1: Peer 1; P2: Peer 2; P1P2: average of the two peers' ratings. Student self-reports: CRITTHNK (critical thinking), CSRS (Conversational Skills Rating Scale), INTCOMP (Interpersonal competence), CMCAGG (aggregated computer-mediated communication competence), GROUPLDR (group communication and leadership competence), PUBMOTIV (public speaking motivation), PUBSKILLS (public communication skills), QUALITY (aggregate communication quality: satisfaction + attraction + effectiveness + appropriateness + clarity), ICC (interpersonal communication competence), PUBLIC (public speaking competence), GROUP (group communication and leadership competence). Upper right bold emphasizes correlations between average peer ratings and student self-ratings. Lower left bold emphasizes correlations between the corresponding measures of the two peers.

* $p < .05$; ** $p < .01$.

variance across ethnic groups. Although the statistical power of these tests are likely affected somewhat by the unequal N across groups (Asians \cong 175, Blacks \cong 43, Whites \cong 610, Hispanics \cong 315), assuming equal group sizes the power to find a small effect (i.e., .10) was approximately .65, and over .95 to find a marginally larger effect (.15). IMPACCT does not appear to be significantly affected by major standard ethnic or cultural self-identifications.

The contrasts by sex produced no significant effects ($p < .01$), and no effects accounting for as much as 1% of the variance. The power to find a small effect (.10), assuming equal group sizes, is approximately .45, but approximately .80 to find a marginally larger effect size (.15). Indications are that IMPACCT is not affected by biological sex of participant.

Another bias cannot be directly assessed, but there is at least a simple intuitive approach to examining it. The “Wobegon” effect has been identified across a wide variety of human domains of endeavor, and is reflected in positively biased self-evaluations of competence and ability (Dunning, Heath, & Suls, 2004). Typical interactants expect their daily communication encounters to be above scale midpoints in achieving goals of being perceived as friendly, liked, competent, intelligent, interesting, honest, and attractive (Nezlek, Schütz, & Sellin, 2007). In this study, peers rated students consistently higher than the students rated themselves, across all domains except public speaking competence (see Table 3). Although competence assessments are above scale midpoint, they are not substantially above the practical midpoint of the 7-point scale. Most of the ratings average between 4.5 and 5.5, despite the obvious social desirability implicit in self-referential competence assessments.

Assessment of Changes From Time 1 to Time 2

People are expected to sustain some degree of stability in self-perceptions. Table 4 reveals strong correlations between parallel Time 1 and Time 2 student self-assessments, ranging between .48 and .65. Despite the relative stability of self-perceptions over the semester, out of 40 separate communication competence constructs measured at Times 1 and Time 2, students reported a statistically significant *increase* on 38 indicators, with no significant decreases ($p < .001$). Only CMC motivation and CMC efficacy failed to show an increase between Time 1 and Time 2. The typical amount of change was approximately a half of a scale interval.

The only reasonable rival explanations for such null results are (a) ‘learning’ the test rather than the competencies, or (b) a cohort effect, in which freshmen generally become more competent (or more positive or confident in their self-evaluations) in their first semester of college coursework. The first possibility does not seem very likely, because there is no obvious reason why mere familiarity with the survey itself would lead to a “more positive or favorable” rating tendency at Time 2. The second rival possibility is a problem with almost any collegiate assessment, and could only reasonably be ruled out by administering the IMPACCT survey to first-semester freshmen students in some other course who are not taking a communication course.

Table 3 Differences Between Student Self-Perceived Competence and Nominated Peers 1 and 2 Perceptions of Student's Competence at Time 1

	T1 Mean	T1 SD	T2 Mean	T2 SD	Mean Δ	SD	SEM	Lower CI (95%)	Higher CI (95%)	<i>t</i>	<i>df</i>	<i>p</i> <
T1CSRS-PIICC	4.60	.80	5.51	.90	-.92	1.09	.04	-.99	-.84	-24.53	854	.001
T1CSRS-P2ICC	4.58	.81	5.49	.96	-.91	1.13	.04	-.98	-.83	-23.21	827	.001
T1INTCOMP- PIICC	4.89	.77	5.51	.90	-.62	.99	.03	-.69	-.55	-18.25	854	.001
T1INTCOMP- P2ICC	4.86	.76	5.49	.96	-.62	1.08	.04	-.70	-.55	-16.55	827	.001
T1CMCAGG- P1CMC	5.03	.83	5.40	1.53	-.37	1.64	.06	-.48	-.26	-6.55	854	.001
T1CMCAGG- P2CMC	5.03	.85	5.37	1.47	-.34	1.61	.06	-.45	-.23	-6.15	827	.001
T1PUBSKILLS- P1PUBLIC	4.58	.92	4.53	1.84	.05	1.88	.06	-.08	.18	.79	851	.429
T1PUBSKILLS- P2PUBLIC	4.58	.91	4.58	1.83	-.01	1.87	.07	-.13	.12	-.10	825	.918
T1GROUPLDR- P1GROUP	4.93	.78	5.33	1.39	-.40	1.45	.05	-.50	-.31	-8.14	854	.001
T1GROUPLDR- P2GROUP	4.91	.75	5.32	1.44	-.40	1.56	.05	-.51	-.30	-7.46	827	.001

Note. T1: Time 1; P1: Peer 1; P2: Peer 2. Student self-reports: CSRS (Conversational Skills Rating Scale), INTCOMP (Interpersonal competence), CMCAGG (aggregated computer-mediated communication competence), GROUPLDR (group communication and leadership competence), PUBMOTIV (public speaking motivation), PUBSKILLS (public communication skills), ICC (interpersonal communication competence), PUBLIC (public speaking competence), GROUP (group communication and leadership competence).

* $p < .05$, ** $p < .01$.

The evidence is otherwise consistent with the conclusion that the basic communication course instruction is significantly enhancing students' skills, and doing so in a fairly comprehensive manner. The average effect represents an average of about .20 to .40 increase in a given interval of 7-point response scale. If each integer interval is viewed as consisting of 10 subintervals of .1, this is only about a 3 to 6% shift overall, but if thought of as a shift within the *practical range* of intervals, ranging from 3 to 7, it equates to something more on the order of 5% to 10% of improvement over the 12 weeks of the semester. The largest gain is in self-rated public speaking skills (.6, or an increase of about 15% of the practical scale of assessment).

Criterion Validity

At its core, the conative model proposed by Spitzberg and colleagues (Spitzberg, 2000, 2009a; Spitzberg & Brunner, 1991; Spitzberg & Cupach, 1984) predicts that motivation, knowledge and skills predict *impressions* of competence. This suggests a predictive model in which motivational, knowledge, and skills-based constructs predict molar judgments of competence. This model is typically tested by treating constructs such as appropriateness, effectiveness, clarity, satisfaction, and attractiveness as criterion outcomes of competent interaction, with the various motivational,

Table 4 Zero-Order Correlations Among and Between Time 1 and Time 2 Constructs ($n \cong 1140\text{--}1491$)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	CRITTHNK														
2.	T1CSRS	.072**													
3.	T1INTCOMP	.080**	.689***												
4.	T1CMCAGG	.105***	.346***	.520***											
5.	T1GROUPLDR	.078**	.528***	.700***	.541***										
6.	T1PUBMOTIV	.107***	.400***	.299***	.082***	.212***									
7.	T1PUBSKILLS	.082**	.613***	.632***	.459***	.671***	.458***								
8.	T1QUALITY	.076**	.548***	.739***	.606***	.724***	.180***	.615***							
9.	T2CSRS	.084**	.478***	.466***	.301***	.431***	.285***	.463***	.413***						
10.	T2INTCOMP	.067*	.448***	.618***	.356***	.512***	.249***	.462***	.542***	.751***					
11.	T2CMCAGG	.092***	.271***	.379***	.581***	.361***	.064*	.336***	.428***	.518***	.618***				
12.	T2GROUPLDR	.036	.353***	.470***	.344***	.495***	.147***	.401***	.457***	.593***	.733***	.600***			
13.	T2PUBMOTIV	.050	.320***	.271***	.126***	.208***	.647***	.371***	.192***	.381***	.303***	.150***	.234***		
14.	T2PUBSKILLS	.073**	.407***	.464***	.336***	.452***	.280***	.545***	.453***	.654***	.697***	.577***	.696***	.385***	
15.	T2QUALITY	.037	.373***	.517***	.392***	.466***	.154***	.427***	.565***	.616***	.772***	.680***	.746***	.230***	.688***

Note. Bold numbers represent the T1 construct correlation with its T2 equivalent.
 * $p < .05$; ** $p < .01$; *** $p < .001$.

knowledge, and skills constructs as predictors. The measures reveal nonsignificant to strong intercorrelations within each time period. To the extent that significant amounts of additive variance are accounted for in such outcomes, it would support the criterion validity of the IMPACCT measure.

Three models were examined. First, Time 1 *communication quality* was used as a dependent variable. It represented the aggregation of the student self-rated five criterion evaluations of communication quality: appropriateness, effectiveness, clarity, attractiveness, and satisfaction. The independent variables were entered stepwise in groups from the Time 1 measures: (a) critical thinking, (b) CSRS, 22 of the 23 interpersonal competence subscales—sans the group subscale; (c) CMC motivation, CMC knowledge, CMC coordination, CMC expressiveness, CMC composure, CMC attentiveness, CMC adaptability, CMC efficacy; (d) group/leadership competence, the group subscale from the interpersonal competence measure; (e) public speaking motivation, public speaking skills; (f) each peer's ratings of the student's molar competence, interpersonal competence, CMC competence, group/leadership competence, and public speaking competence. The second regression model paralleled the first, but used Time 2 constructs where substitutable. The third model used the same variables in the first Time 1 model, except the dependent variable was Time 2 communication quality.

As displayed in Table 5, a student's communication quality is highly predictable, with 66% of the variance accounted for by 17 competence variables. Because regressions are sensitive to order of entry, it is not surprising that the bulk of the variables are interpersonal, but each context is represented. It is important to note,

Table 5 Multiple Regression of Time 1 (T1) Predictors Onto Time 1 Communication Quality (APP + EFF + ATTR + CLRTY + SAT)

DV = T1: Communication Quality	R	R ²	R ² (adj)	Beta	R ² Δ	FΔ	df2	p
Sex	.051	.003	.001	.028	.003	1.781	685	.182
Peer ratings ^a	.701	.492	.490	.083	.489	657.698	684	.000
P1-ICC				-.029				
P1-Group				-.041				
P1-CMC				-.011				
P1-Public				-.004				
P2-ICC				.004				
P2-Group				-.032				
P2-CMC				.026				
P2-Public				.233				
T1-Group/Leadership Skills	.748	.560	.558	.100	.068	105.894	683	.000
T1-Adaptability Skills	.771	.594	.592	.121	.034	57.321	682	.000
T1-Meaning Skills	.787	.619	.616	.062	.025	44.381	681	.000
T1-CMC-Expressiveness Skills	.794	.630	.627	.133	.011	20.888	680	.000
T1-CMC-Adaptability Skills	.799	.638	.635	.144	.008	15.540	679	.000
T1-CMC-Coordination Skills	.805	.648	.644	.093	.010	18.522	678	.000
T1-Immediacy	.809	.655	.650	.099	.007	13.465	677	.000
T1-Public Speaking Skills	.812	.659	.654	.086	.004	8.048	676	.005
T1-Intercultural Skills	.814	.662	.657	.067	.003	6.743	675	.010

^aVariables force-entered as a set.

Table 6 Trimmed Multiple Regression of Time 1 (T1) Predictors Onto Time 2 Communication Quality (APP + EFF + ATTR + CLRTY + SAT)

DV = T2 Communication Quality	R	R ²	R ² adj.	Beta	R ² Δ	FΔ	df	p
T2-Group & Leadership Skills	.747	.557	.557	.222	.557	1618.68	1285	.001
T2-CMC-Adaptability	.801	.642	.642	.193	.085	304.79	1284	.001
T2-Meaning Skills	.825	.681	.680	.087	.039	155.57	1283	.001
T2-CMC-Expressiveness Skills	.835	.698	.697	.071	.017	70.39	1282	.001
T2-Persuasion Skills	.842	.709	.708	.094	.012	50.76	1281	.001
T2-Adaptability Skills	.846	.716	.715	.060	.007	31.46	1280	.001
T2-Public Speaking Skills	.850	.722	.720	.104	.006	26.75	1279	.001
T2-Collaboration Skills	.852	.726	.724	.063	.004	17.02	1278	.001
T2-CMC-Attentiveness Skills	.853	.728	.727	.057	.003	13.22	1277	.001
T2-Narrative Skills	.855	.731	.729	.081	.002	11.77	1276	.001
T2-Listening Skills	.856	.733	.730	.047	.002	8.17	1275	.004
T2-CMC-Coordination Skills	.857	.734	.731	.057	.001	5.39	1274	.020
T2-Humor Skills	.857	.735	.732	-.048	.001	5.46	1273	.020
T2-Immediacy Skills	.858	.736	.733	.042	.001	5.24	1272	.022

however, that critical thinking did not enter the model. Peer-rated competence revealed modest predictive value. A largely similar picture emerges with the prediction of Time 2 communication quality with Time 2 variables (see Table 6). The variables account for 73% of the variance in Time 2 communication quality, with several variables entering the model that are different from the model for Time 1. Neither critical thinking nor any of the peer ratings entered the model. The third model intended to see if Time 1 perceptions of competence would predict Time 2 perceptions of communication quality. The Time 1 variables accounted for 30% of the variance (Table 7). None of the peer rating variables at Time 1 contributed to the model.

Discussion

There are several significant findings resulting from this study. First, the assessment methodology overall is feasible, relatively convenient, psychometrically reliable, and capable of handling large numbers of students. Second, a student's self-perception of communication competence at a given time is highly predictable by the kinds of

Table 7 Trimmed Multiple Regression of Time 1 (T1) predictors Onto Time 2 Communication Quality (APP + EFF + ATTR + CLRTY + SAT)

DV = T2 Communication Quality	R	R ²	R ² adj.	Beta	R ² Δ	FΔ	df	p
T1-Group & Leadership Skills	.460	.212	.211	.152	.212	300.18	1117	.001
T1-Meaning Skills	.506	.256	.255	.113	.044	66.51	1116	.001
T1-Persuasion Skills	.524	.274	.272	.122	.018	28.00	1115	.001
T1-CMC-Attentiveness Skills	.537	.289	.286	.078	.014	22.61	1114	.001
T1-Supportiveness Skills	.545	.297	.294	.073	.008	12.85	1113	.001
T1-Public Speaking Skills	.550	.302	.298	.107	.005	8.43	1112	.004
T1-CMC-Efficacy	.552	.305	.301	.065	.003	4.87	1111	.028
T1-Empathy Skills	.555	.308	.303	.075	.003	4.69	1110	.031

skills and competencies often covered as topics in communication curricula. In this study, approximately 70% of a student's overall self-perceived communication quality is predictable by the skills assessed by the IMPACCT. Third, however, the measure of critical thinking was unrelated, and the peer evaluations of student competence are only slightly related, to the student's own self-evaluations. In addition, the student's self-evaluations at Time 1 were related modestly to their self-evaluations at Time 2. These latter results will require extensive future consideration regarding their theoretical, methodological, and pedagogical implications. In particular, the critical thinking measure will need to be significantly retooled to be more relevant to argument and reasoning analysis, in an attempt to bring it closer to skills likely to be relevant to communication majors and curricula. This process is currently underway.

Research and theory have long indicated that self-perceptions of competence are often discrepant from the perceptions and metaperceptions of others (Cupach & Spitzberg, 1983; Spitzberg, 1987), but *some* correspondence of perceptions and metaperceptions of social behavior is generally expected (Allik, Realo, Mõttus, & Kuppens, 2010; Kenny, 1994). Further, by virtue of the same person producing the evaluations at Time 1 and Time 2, it would be reasonable to expect at least some shared variance from method artifact alone. From a theoretical perspective, it now becomes important to consider what variables moderate interpersonal correspondence of perceptions of competence. For example, are the self-perceptions of high self-monitors or highly cognitively complex interactants more correspondent with peers' views of the interactants' competence (Spitzberg, 1990, 1991)? Is the size of the discrepancy itself an indirect measure of interactional incompetence? Might peers who are more engaged with the student's educational experience be more correspondent (Waldron & Yungbluth, 2007)? The cognitive schematic configuring of what *constitutes* competence may remain relatively stable over time (Canary & MacGregor, 2008; Pavitt, 1989, 1990; Pavitt & Haight, 1985), yet the association of these concepts may be relatively fluid in the transition to the first semester of university experience. Are the cohort developmental effects of the college, and especially the freshman, experience in general, separable from the influences of exposure to the communication course specifically?

A final important result of this study is the demonstration that student self-perceptions of competence increased significantly over the course of the semester. There are at least two reasonable rival hypotheses to account for such an increase. First, familiarity with the test might lead participants to either anticipate implications of more favorable ratings (i.e., a demand effect). Second, there may be a cohort effect in which first-semester freshmen in general tend to be on a developmental path of increased communication skills and self-evaluation in the transition to their new social context. The first hypothesis seems relatively weak, for lack of clear theoretical basis. The first year of college is known as a highly stressful time, and failure experiences seem likely to be at least as common as success experiences (Kingston, 2008; Thompson, 2008). The second hypothesis, however, can be addressed by assessing students in the same semester at the same university, but not enrolled (and having

not taken) a course in communication. This will be an important priority for future research on the IMPACCT.

Approaches to communication competence assessment in the academic context commonly run afoul of a number of limitations. They are often not based on any strong theoretical basis. They are often 'one-off' approaches derived from the politics of local academic contexts and curricula. They are seldom submitted to rigorous empirical validation efforts. They are also often labor-intensive, inefficient, and complicated. The IMPACCT system attempts to address these concerns directly.

The IMPACCT assessment potentially fits the needs of many higher education communication programs. It is convenient, time-efficient for faculty, self-administered, and permits the development of program reports for ongoing administrative evaluation, as well as providing feedback for students. It appears unbiased by gender and by ethnicity. It provides one source of evidence of curricular effectiveness in enhancing student communication competence. It provides more than mere self-assessment by providing 'naturalistic expert' evaluation of student competence in the form of peer raters. It also has the potential to eventually provide comparative data for program evaluation relative to national, regional, and institutional norms. It is demonstrably reliable, and scalable to both small and large institutional applications. The design of this assessment project provides several potential advantages:

1. Online Access: the ability of a student to link from any online location, and enter the online IMPACCT assessment system;
2. Interactive Participation: the incorporation of interactive elements in the critical thinking component that diminish the routine repetition of ordinary surveys;
3. Personal Portfolio Profiles: the ability to produce a graphic personal profile sheet to represent how the student scored relative to others who have completed the IMPACCT on themselves;
4. "360°" Assessment: to overcome the limitations of a purely self-report assessment, the student receives 'reflected appraisals' of raters familiar with the student's communication abilities;
5. Change Scores: the ability to compare Time 1 to Time 2 assessments, which can evidence the effect(s) of intervening educational experiences;
6. Diagnoses of Multiple Skills: IMPACCT provides assessment of a comprehensive set of communication competencies, as represented in most communication curricula;
7. Scalability: in the future, it will be relatively easy to expand the conceptual breadth of IMPACCT subscales to provide a customizable menu of assessment options that reflect the particular departmental priorities of a given communication program or institutional objectives;
8. Comparative potential: the potential, with wider scale adoption by colleges and universities, to tailor the data comparisons by type of region, institution, or even for the first time in the communication discipline, national norms;

9. Data Management: the ability to download aggregate data from the assessment system to develop statistical reports on the status of students at the college or university;
10. Research: the ability to incorporate new measures each semester to promote ongoing basic and applied research into instructionally related and assessment issues.

Future Implications

This measure will continue to evolve, and ongoing analyses will be conducted on the data reported here and on the ongoing data being collected. In the context of this evolution, there are numerous avenues for future research, most extending from recognition of the many limitations of this study and this approach to assessment. First, although social desirability does not appear to be a problem with online surveys per se (Richman, Kiesler, Weisband, & Drasgow, 1999), research on social desirability continues to indicate severe validity problems with existing self-report measures (e.g., Barger, 2002; Leite & Beretvas, 2005; Thompson & Phua, 2005). It will be important to continue investigating sources of bias in the IMPACCT measure, given its reliance on self-report methods. Second, as research continues, it will be important to examine the existence of systematic differences among peer raters. If, for example, 'friends' rate students higher than 'siblings' or 'coworkers,' then this has significant implications not only for the design of IMPACCT, but also for the understanding of the nature of social evaluation biases. Third, measures of peer rating 'certainty' and of peer 'familiarity' with the student may assist with examining moderating effects of such variables on the consistency of peer evaluations with student self-evaluations. Fourth, over time, any number of new skills and competencies, as well as other theoretically grounded constructs, can be integrated on a revolving basis into IMPACCT to provide research opportunities for extending existing knowledge. For example, are the constructs of argumentativeness or cognitive complexity related to self- and peer-ratings of competence, as well as student progress across an academic major? Fifth, IMPACCT ratings will eventually need to be linked empirically to student performance and instructor evaluations in the classroom, if only to begin to understand the nature of student and peer perceptions of communication quality with the types of assessments applied in instructional contexts. Finally, the generalizability of IMPACCT assessments to domains such as employment, relationship quality and psychological adjustment (Waldron & Lavitt, 2000, 2001) will provide additional opportunities for examining the role of communication in quality of life.

Notes

- [1] Most of the underwriting of the online engineering and software development for this project was from a gift to the School of Communication and the College of Professional Studies and Fine Arts at San Diego State University. The donor, Sanford I. Berman, Ph.D., wanted the gift to advance concepts of general semantics in ways that would facilitate student

education and communication excellence. Therefore, the critical thinking items were written with feedback oriented to general semantics principles.

- [2] A copy of the text and figures of the critical thinking items is available by request of the author.
- [3] There were three items written for this subscale, but one (“at small talk”) was inadvertently left out of the IMPACCT. It has been reinserted in the current operating version of IMPACCT.
- [4] A welcome debate with the reviewers regarding the necessity and appropriateness of factor analysis developed, which warrants extended comment for the sake of future research on measurement issues related to communication assessment. It is time to consider seriously the appropriateness of factor analytic techniques for many assessment purposes in communication (see Conway & Huffcutt, 2003; Fabrigar, Wegener, MacCallum, & Strahan, 1999; Park, Dailey, & Lemus, 2002).

First, *communication skills are often best considered causal indicators rather than effect indicators*. Exploratory factor analysis (EFA), in contrast to principal components analysis (PCA), presupposes that there are multiple observed effects of a latent construct. It matters, therefore, whether a factor of corresponding items represents an underlying explanatory cause, or whether the items themselves are the cause of the phenomenon. For example, eye contact and smiling may determine, or be compositional of, expressiveness. A latent model, in contrast, presumes either an underlying skill that produces eye contact and smiling, or a set of behaviors that produce a distinctive impression of these as a collective skill labeled expressiveness (Bollen & Lennox, 1991). One of the implications of this distinction is that construct reliability is essential for effects indicator constructs, but less so for causal indicators “because these correlations are explained by factors outside of the model” (Bollen & Lennox, p. 307). Related, such causal indicators may need to comprise heterogeneous observed indicators, which may mitigate against the likelihood of high interitem correlations (Bollen & Lennox), and thus, the likelihood such items would emerge as coherent factors in EFA.

Second, *the validity of EFA and PCA are dependent on the rating scale*. Just because behavioral items correspond in terms of ratings does not assure that they represent a sound conceptual construct. A factor tends to reflect a commonality of perceptions on the part of raters. The emergence of a communication skill in EFA or PCA, therefore, presupposes both that the rating scale is sensitive to the phenomenal existence of a coherent skill domain and that raters are able to perceptually and coherently discriminate that domain. In the IMPACCT the most common rating scale is a continuum from “extremely below average skill” to “extremely above average skill” compared “to typical conversationalists.” The rating scale is not asking whether or not the skill is *there*, but how the behaviors and abilities indicated in the items fare relative to an abstract continuum of average performance *quality*. Thus, a communicator may be similarly above average across a variety of specific skill domains, which might result in those skills factoring together, even though they may involve substantively distinct domains of cognitive and affective substrates, as well as distinct observable behaviors. Similar reasoning applies to commonly used frequency rating scales—just because eye contact and self-disclosure are used with corresponding frequency does not mean they comprise a coherent or pedagogically meaningful “skill” or ability (Spitzberg, 2003; Spitzberg & Cupach, 2002).

Third, *many communication skills may exist, and yet be relatively indistinguishable or imperceptible to raters*. In the case of the IMPACCT, for example, a presumed skill of *secrecy* (i.e., ability to keep secrets appropriately) is included because it has been identified as an important set of activities in interpersonal interactions and relationships (e.g., T. Afifi, Caughlin, & Afifi, 2007). The question of whether secret-keeping (a) actually exists as a separate set of cognitive

and behavioral routines, (b) is accessible as a phenomenal domain separable from other types of cognitive and behavioral routines, and (c) is psychometrically consistent (i.e., reliable) and distinct (higher intraconstruct item correlations than interconstruct item correlations) is not an obviously legitimate assumption in regard to rater perceptions.

Fourth, *the factor structure is determined as much by the domain sampling as it is by the existence of the effects or causal indicators.* The potential domain of communication competence is vast, but presumably not infinite. Spitzberg and Cupach (1984, 1989, 2002) identified well over 100 empirically derived factors identified by research as compositional of interpersonal competence alone. Any practical measure must make choices of what to include and what to exclude, but the basis for such decisions is not obvious. Thus, for example, secret-keeping is probably no more (or less?) important than *argumentation* or *interviewing* skills, but no measure can reasonably hope to include *all* potentially relevant factors or constructs in its content. Factor analytic techniques are therefore highly sensitive to what indicators, items, and constructs are represented in the initial scale construction. Identifying a factor structure as defined may imply that the resulting structure *comprises* the domain of the construct being operationalized, when in fact it is little more than an artifact of the initial item-generation and selection process.

Fifth, *a priori categorization is therefore a reasonable alternative to EFA and PCA in formulating measurement.* A measure intended for both basic research and applied curricular purposes has dual objectives: reasonable psychometric evidence of construct validity, and relevance to administrative, curricular and instructional needs. These are not necessarily compatible objectives. Students, for example, may spend relatively small amounts of time in an interviewing context, but to the extent that “interviewing” is a curricular option as a course or a set of learning objectives, then a measure may need to include indicators of interviewing regardless of whether or not the indicators form a psychometrically distinct factor or component.

Sixth, in regard to reporting the results of factor analyses in this manuscript, there are too many decision points to permit a coherent discussion of the results and implications, including the following: (a) *Which measures to factor with which other measures:* The IMPACCT comprises motivation constructs, knowledge constructs, and skills constructs. Should these be factored collectively or separately? Should the CSRS items be included with the ‘interpersonal’ items, and should the interpersonal items be included with the small group items, and so on? For example, when the 93 “interpersonal” and conversational (CSRS) items intended to assess 26 to 30 a priori constructs are submitted to PCA, 17 potentially definable factors emerge, and when all 164 “skills” items (sans motivation, knowledge, and outcomes items) are submitted, 25 potentially definable components emerge. Yet, when all items of the IMPACCT are submitted to PCA, the first traditionally definable structure that emerges only reveals 10 components. The results of EFA and PCA are highly dependent upon such initial inclusion decisions, which in turn depend on various objectives for conducting the analyses. (b) *How to match factors across times:* If the Time 1 measures are factored, then must the Time 2 factors be constructed according to these Time 1 factors, even if Time 2 produces different factor structures? In Time 1, for example, the item “speaking about self” loaded modestly on a component with “articulation” and “speaking fluency,” but in Time 2, it loaded on a different component with “smiling and/or laughing” and “use of humor and/or stories.” For curricular assessment reasons, Time 1 and Time 2 indicators must be equivalent, regardless of their factor structures. (c) *Whether both a first- and second-order factor analysis should be employed:* Should the measures be factored at the item level, or at the construct level, or both? For example, when PCA was applied to the 40 a priori motivation, knowledge and skills constructs, in what amounts to a second-order analysis, a six-component solution

emerged, but when the 187 items comprising these constructs are submitted to PCA, a 10-component solution emerged. (d) *What to do with isolated items*: What if a construct considered important by the discipline shows up as an isolate loading? So, for example, “meaning” loaded with humor and persuasion in a second-order factor analysis that extracted six factors, but did not load anywhere when 10 factors were extracted. Should the assessment of a student’s perceived ability to “get meaning across accurately” go unassessed because it does not load on a factor? (e) *Which criteria should be applied for determining the number of factors to extract and define*. All of the standard criteria have demonstrated substantial limitations (Fabrigar et al., 1999; Floyd & Widaman, 1995). For all these reasons, and especially given the constraints of manuscript length in reporting the measure debut, the risks of concretizing a factor structure in reporting this measure before all these relevant issues get properly aired in scholarly forums justifies pursuing these issues in separate scholarly and academic contexts and manuscripts. The results of first- and second-order EFAs and PCAs are available from the author upon request.

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