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SELF-RATINGS OF COMMUNICATION STYLE AND DISCOURSE PERFORMANCE OF HEALTHY AGING ADULTS

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SELF-RATINGS OF COMMUNICATION STYLE AND DISCOURSE
PERFORMANCE OF HEALTHY AGING ADULTS

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Health Sciences
at the University of Kentucky

By

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Disorders

Lexington, KY

2013

ABSTRACT OF THESIS

SELF-RATINGS OF COMMUNICATION STYLE AND DISCOURSE
PERFORMANCE OF HEALTHY AGING ADULTS

This study investigated the accuracy of healthy aging adults' self-rating of communication style, as measured by quantifiable measures of discourse performance. Ninety cognitively healthy adults participated and comprised three age cohorts (20s, 40s, 60s). Participants completed discourse tasks that included recounting a vacation, telling a story, and describing a picture. Participants also self-rated their communication style, placing them in a talkative or reserved cohort. Communication style was measured by discourse performance variables of interest: length of output (TNW) and informativeness (%IU). When presented with an unconstrained task (recounting a vacation), talkative and reserved groups, regardless of age, produced a similar TNW and %IU. When considering age and self-rating, talkative 20, 40, and 60 year olds produced a similar TNW and %IU as reserved 20, 40, and 60 year olds. Overall, adults were found to be inaccurate, due to lack of significant differences between self-rating groups. Results indicated the need for further research on the relationship between age, discourse performance, and accuracy of self-rating of communication style of healthy aging adults.

KEYWORDS: healthy aging, communication style, self-rating, discourse, task constraint

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_____ 5/3/2013 _____

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ACKNOWLEDGMENTS

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Chapter One: Introduction

Background

Communication style is defined as the way in which one uses signals to process, interpret, filter, or understand literal meaning (Norton, 1983). Norton asserted that communication style is observable, multifaceted, and though variable, it remains sufficiently patterned to create expectations. Expectations and conversational rules were discussed by Grice (1975), who defined four conversational maxims (or guidelines). For a conversational exchange to be considered appropriate, maxims of quantity (e.g. "Make your contribution as informative as required"), quality (e.g. "Don't say what you lack adequate evidence for"), relation (e.g. "Be relevant"), and manner (e.g. "Clearly express yourself") should be considered (Grice, 1975). Older adults violate expectations for appropriate quantity, relation, and manner when they produce verbose spoken discourse (Mackenzie, 2000). These findings are of significance for older populations, specifically those over 60, and can serve as a basis for negative conversational expectations (Mackenzie, 2000; Odato & Keller-Cohen, 2009). Understanding patterns of communication style for adults through the lifespan is of increasing importance as the number of older adults continues to rise (Administration on Aging, 2010). Awareness of the effects of advancing age allow for more appropriate expectations for conversational exchanges (Mackenzie, 2000), and clinically, permit a better understanding of what is and is not a characteristic of healthy aging. Determining typical versus disordered communication in aging adults could result in earlier detection of neurological disorders, as the effects from such disorders are often reflected in communication exchanges.

Effects of aging on communication performance have been measured using both listener ratings (Allman & O'Hair, 1994; James et al, 1998; Montgomery & Norton, 1981; Odato & Keller-Cohen, 2009) and self-ratings of communication style (Montgomery and Norton, 1981; Teven, Richmond, McCroskey and McCroskey, 2010). Collectively, studies provide support for the use of both approaches. Listener ratings have been used to explore listener perceived effects of goals for communication, gender, and age on communication style. Self-ratings have been measured using questionnaires to determine how adults perceive their communication competence and how adults perceive influence of gender on communication style.

Communication style is most frequently measured in the context of discourse tasks. Garvey (1977) defined discourse as an interaction in which two people organize a verbal exchange. Discourse tasks allow for sampling of communication style. However, to comprehensively investigate self-ratings of communication style, one must consider the influences on discourse performance, such as *age* (Bortfeld et al., 2001; Capilouto, Wright, & Wagovich, 2005; James et al., 1998; Mackenzie, 1999; Wright, Capilouto, Srinivason, & Fergadiotis, 2011) and *task constraint* (Bortfeld et al., 2001; Cannizzaro & Coehlo, 2003; Coehlo, 2002; Federmeier & Kutas, 2005; James et al., 1998; Wright & Capilouto, 2009; Wright et al, 2005).

James et al. (1998) concluded that *age-related differences* in communication style were based upon the *degree of constraint* (level of scaffolding) inherent in the task presented to healthy aging adults in the study. Communication style can be quantified through measures of discourse performance, such as length of output and informativeness. Jointly, studies have shown that more open ended tasks (e.g. interview,

recount of an event) are associated with lengthier samples and decreased informativeness, while more constrained tasks (e.g. story re-telling, picture description) were associated with increased informativeness (Bortfeld, Leon, Bloom, Schober, & Brennan, 2001; James et al., 1998; Thorton & Light, 2006). James et al. hypothesized that increased constraint provides more communication support (i.e. scaffolding) which assists the speaker by keeping him/her on task.

In summary, research supports the use of both listener-ratings and self-ratings of communication style. However, accuracy of ratings of communication style should be confirmed through measures of discourse performance (i.e. - length of output and informativeness). Determining how communication style, as measured by variables of discourse performance, varies with age and task type will provide a baseline for understanding what is and is not typical communication throughout the lifespan. Clinically, the relationship between discourse performance and self-ratings of communication style must be established, to provide speech-language pathologists with a basis for determining if clients are experiencing changes as a result of healthy aging or due to an etiology. Therefore, *the purpose of the present study is to explore the accuracy of healthy aging adults' self-ratings of communication style, as measured by quantifiable measures of discourse performance.*

This study addresses the following research questions:

1. Are quantitative measures of discourse performance associated with self-ratings of communication style?

    a. Is the total number of words (TNW) for the unconstrained task associated with self-ratings of communication style?

It is hypothesized that the self-rated talkative group (participants with a mean of 3 or greater for the 2 communication style questions of interest) will have a significantly higher mean TNW than the self-rated reserved group for the unconstrained task.

b. Is the percent of information units (%IU) for the unconstrained task associated with self-ratings of communication style for the unconstrained task?

It is hypothesized that the self-rated talkative group (participants with a mean of 3 or greater for the 2 communication style questions of interest) will have a significantly lower mean %IU than the self-rated reserved group for the unconstrained task.

2. Is the relationship between self-ratings of communication style and quantitative measures of discourse performance influenced by age?

a. Is the relationship between self-ratings of communication style (talkative versus reserved) and TNW produced in an unconstrained task influenced by age?

It is hypothesized that self-rating of communication style, TNW, and age are significantly related.

b. Is the relationship between self-ratings of communication style (talkative versus reserved) and %IU produced in an unconstrained task influenced by age?

It is hypothesized that self-rating of communication style, %IU, and age are significantly related.

Chapter Two: Review of the Literature

Communication Style

To answer the questions of interest, a review of the literature was conducted for the topics of communication style and the influence of age and task on discourse performance. These topics are discussed as they directly relate to the current study.

Norton (1983) defined communication style as the manner in which one uses signals to process, interpret, filter, or understand literal meaning. Furthermore, Norton asserted that communication style is observable, multifaceted, and though variable, it remains sufficiently patterned to create expectations. Montgomery and Norton (1981) explained the significance of understanding communication style as it pertains to communication exchange by saying that, "Understanding the perceptions of one's own and others' behavior may be as vital to the explanation of the communication process as is the behavior itself" (p. 122), as perceptions of communication style determine expected outcomes of social interactions, which influence behavior (Montgomery and Norton, 1981).

Goals for the communication exchange as well as the gender and age of the communication partner have been found to influence ratings of communication style (Allman & O'Hair, 1994; James et al, 1998; Montgomery & Norton, 1981; Odato & Keller-Cohen, 2009). James and colleagues (1998) investigated how goals of a communication exchange influence discourse production. Authors explored off-topic speech and task type in twenty healthy young adults ($M = 19.4$ years, $SD = 1.2$) and twenty healthy aging older adults ($M = 73.1$ years, $SD = 4.2$). Off-topic speech (OTS) was defined as speech that began as relevant to a topic, but subsequently became more loosely

related or entirely unrelated to the topic (Arbuckle & Gold, 1993). Participants recounted 3 personal narratives and described 3 pictures. OTS was measured by the number of off topic words. Each instance of OTS was scored as "indirectly relevant" or "irrelevant." Results indicated that OTS was significantly greater for the older group compared to the younger group for personal narratives but not picture descriptions. The authors concluded that age-related differences in producing OTS were conditional and may have been intentional based upon the speaker's goals for the exchange. Researchers suggested that older participants may have had more experience storytelling and therefore were more inclined to give detail.

Gender is another factor that has been shown to influence listener perceptions of communication style. People tend to believe that women and men speak differently (Crawford, 1995), with recent studies confirming the stereotype that women are more talkative than men (Mehl, Vazire, Ramirez-Esparza, Slatcher, & Pennebaker, 2007; Popp, et al., 2003). Odato and Keller-Cohen (2009) explored gender stereotypes in listener perception of communication style. Participants included 40 undergraduate students (ages 18-25, $M = 20.1$, $SD = 1.8$) and 40 community dwelling older adults (ages 70-97, $M = 78.8$, $SD = 5.7$). Four narrative transcripts were taken from a previous study (2 stories with a conflict and resolution and 2 anecdotes) and researchers inserted two instances of off-topic speech into each transcript to ensure OTS was present. Participants were given all four narratives after being told the transcripts were from a female or male speaker who was young (26 years old) or old (81 years old). After reading the four transcripts, participants evaluated OTS by provided ratings for: focus, clarity, interest, and verbosity.

Transcripts were judged to contain significantly less OTS when the speaker was identified as a female versus a male, regardless of age of the listener.

Allman and O'Hair (1994) investigated age biases of listeners and speakers in conversations. They sought to determine how listeners perceive their communication partner's competence and how communication satisfaction differs based on the age of one's communication partner. One hundred and ninety participants (M = 87, F = 103) were divided into two large cohorts: 119 Young Group (ages 18-28) and 71 Old Group (ages 57-86). The two cohorts were further subdivided into cohort pairs, acting as communication partners. Communication dyads included old-young (*N* = 28), young-old (*N* = 28), old-old (*N* = 42), and young-young (*N* = 92) pairs. Dyads conversed, then reported their perception of their partner's communicative competence and reported their own personal satisfaction with the conversational exchange. Communication competence was measured using the Conversational Skills Rating Scale (Spitzberg & Hurt, 1987). Communication satisfaction, or how satisfied one was with the exchange, was measured using the Interpersonal Communication Satisfaction Inventory (Hecht, 1978). Findings showed, with respect to competence, that older participants considered young communication partners to be significantly more competent than young participants paired with old participants. Findings showed, with respect to satisfaction, that older participants were also significantly more satisfied with conversations that took place with young persons, while young persons were significantly less satisfied regardless of the age of their communication partner.

Odato and Keller-Cohen (2009) also investigated age biases and results were in agreement with Allman and O-Hair (1994). They found that young listeners based their

ratings on the age of their partner. Authors attributed this variation in rating style to a "benchmark" which they hypothesized younger listeners used to guide ratings (Biernat, 2003). For example, a young listener might categorize an older speaker as assertive *for their age* but would rate a young speaker with the same output as less assertive.

Taken together, the above studies suggest that goals for the exchange, gender, and age influence listener perceived communication style. Age-related differences in producing OTS may be intentional based upon the speaker's goals for the exchange. For instance, older adults may have a background that resulted in more storytelling experience, making them more inclined to give detail. Age also impacts listener ratings of competence and satisfaction, with older adults inclined to feel that young communication partners are more competent and satisfactory communicators. Younger communicators were found to feel less satisfied with conversational partners, regardless of age. Listener perception varies based on age of the listener *and* speaker. Listeners have a tendency to rate speakers based on expectations for the speaker's same-aged peers, not on communicative performance. Gender also influenced listener perceptions of communication style, with female speakers judged to produce less off topic speech.

Each of the above studies focused on *listener perception* as the measure of communication style. Communication style may also be measured via a self-rating scale. Self-ratings of communication style are derived from questionnaires and have been used clinically and in research to determine how one views their own communication. Self-ratings have proven valuable for measuring one's feelings of communication competence and when measuring effects of personality and gender on communication (McCrosky &

McCrosky, 1988; Montgomery and Norton, 1981; Teven, Richmond, McCroskey and McCroskey, 2010).

McCroskey and McCroskey (1988) developed the Self-Perceived Communication Competence (SPCC) scale which included a list of 12 situations, each having the participant hypothetically speaking in varied contexts (public, a meeting, a group, or in a dyad) with varied receivers (a stranger, acquaintance, or friend). Participants rated their communicative competence for each situation on a scale ranging from 0 (completely incompetent) to 100 (completely competent). The SPCC scale was used to explore the relationship between personality and communication style by Teven and colleagues (2010). Specifically, they were interested in the degree to which six self-rated communication *traits* (shyness, willingness to communicate, compulsiveness, aggressiveness, Machiavellianism, and apprehension) were related to self-perceived communication competence. The study included 140 undergraduate students (M = 68, F = 72) ranging in age from 18-38 (*M* = 21.49, *SD* = 3.98). Results indicated that the communication traits of apprehension, willingness to communicate, and shyness were significantly related to self-perceived communication competence. Increased apprehension and shyness resulted in significantly lower ratings of self-perceived communication competence. In contrast, increased willingness to communicate was significantly correlated with higher ratings of self-perceived communication competence. Researchers concluded that communication traits influence how one self-rates their communication style. Multiple traits were significantly correlated with self-perception of communication competence, indicating that individuals are aware of their personality and rate their communication based on said personality traits.

Montgomery and Norton (1981) explored the relationship between gender and typical self-ratings of communication style using the Communication Style Measure-Short Form (Norton, 1978). The Communication Style Measure-Short Form includes Likert-type scales which assess 10 independent variables related to personality traits and one dependent variable related to how one views their communicator image (i.e.- I am a very good communicator). In two studies, participants included 736 (M = 473, F = 263) and 382 (M = 238, F = 144) college students, with participants selected for their perspective study based upon semester of enrollment in an interpersonal communication course. Findings indicated that males rated themselves as significantly more precise communicators compared to female self-ratings. Females rated themselves as significantly more animated as compared to males. No significant differences were found between participants with respect to self-ratings of: impression leaving, contentious, open, dramatic, dominant, relaxed, friendly, and attentive. Authors concluded that males and females report more similarities than differences in communication styles, suggesting that men and women differ minimally in their self-ratings of their communication styles.

These studies demonstrate that self-rating of communication style is an effective means for measuring communication competence. Montgomery and Norton (1981) found that males and females report more similarities than differences in self-rated communication style. Teven and colleagues (2010) also used self-rating measures to lead them to the conclusion that communication *traits* (or personality traits as discussed above) influence how one self-rates *communication style*.

For each of the above studies, communication style was measured in the context of interactive discourse. Garvey (1977) defined discourse as an interaction in which two

people organize a verbal exchange. Discourse tasks allow for sampling of communication and communication style. However, to comprehensively investigate self-perception of communication style, one must consider the influences on discourse performance, such as *age* (Bortfeld et al., 2001; Capilouto, Wright, & Wagovich, 2005; James et al., 1998; Mackenzie, 1999; Wright, Capilouto, Srinivason, & Fergadiotis, 2011) and *task constraint* (Bortfeld et al., 2001; Cannizzaro & Coehlo, 2003; Coehlo, 2002; Federmeier & Kutas, 2005; James et al., 1998; Wright & Capilouto, 2009; Wright et al, 2005). Of relevance to the present study are investigations that explored aging and discourse where length of the sample and informativeness served as the outcome variables of interest.

<center>*Influence of Age and Task on Discourse Production*</center>

In the previously described study by James and colleagues (1998) the relationship between aging, off-topic speech (OTS), and task type was explored. The authors found that *age-related differences* in production of OTS were based upon the *degree of constraint* inherent in the task. More open-ended tasks (e.g. interview, recount of an event) are thought to be associated with lengthier samples and decreased informativeness, while more constrained tasks (e.g. storytelling, picture description) are thought to be associated with increased informativeness (Bortfeld, Leon, Bloom, Schober, & Brennan, 2001; James et al., 1998; Thorton & Light, 2006). The authors concluded that studies must use tasks of various levels of constraint when eliciting discourse samples to explore the relationship between length and informativeness of output. They hypothesized that increased constraint results in more support or scaffolding, which assists the speaker with remaining on task. However, how the speaker uses constraint varies based upon age.

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Pictures are considered constrained tasks as they provide a significant amount of scaffolding for the speaker (Heath, 1986). Picture descriptions are used in research for eliciting discourse samples due to the practical nature of the task. Picture description tasks allow for sampling of discourse in a systematic fashion, while lessening the demands on the speaker's memory (Mackenzie, 2000). Stimuli may be either a single picture, or a picture sequence (multiple scenes chronologically depicting parts of one story). Capilouto, Wright, & Wagovich (2005) used a picture description task to compare informativeness of young and older healthy adults. Participants included 34 cognitively healthy adults divided into two cohorts: younger group ($N = 17$, $M = 22.4$, $SD = 2.2$) and older group ($N = 17$, $M = 71.4$, $SD = 8.2$). Participants were presented 2 single picture stimuli and 2 sequential picture stimuli from Nicholas and Brookshire (1993) and asked to describe the events depicted. Discourse productions were analyzed to determine the amount of information conveyed. Results indicated that the young group produced significantly more accurate and informative content than the older group. Authors concluded that for constrained tasks, discourse performance was affected by age.

Wright and Capilouto (2009) examined how participants' linguistic performance varied based on presentation of instructions for two picture description tasks. Participants included 24 healthy aging adults ages 55-77, divided equally into two groups based on task instructions: picture description group (M = 6, F = 6) and storytelling group (M = 4, F = 8). Both groups were shown one single picture and one framed sequence, but were given differing instructions based on group assignment. Participants in the picture description group were instructed to "talk about what is going on in the picture." The story telling group was given story-like instructions to "look at the picture and tell me a

story that has a beginning, middle, and end." Transcripts were analyzed for information units, length of the sample, and main events (significant events from the pictures). Results indicated that the storytelling group (more specific instructions) produced a greater number of words than the picture description group. Additionally, the sequential picture stimuli led participants to produce significantly more words than were elicited by single pictures, regardless of instructions given. Results also indicated that instructing participants to create a story that had a beginning, middle, and end significantly promoted use of detail for both single and sequential picture stimuli. Researchers reported findings which were similar to their previous work (Capilouto et al., 2005; Wright et al., 2005), indicating that listing events and characters without identifying the connection(s) among them in a story-like manner is especially apparent when the stimulus is a single picture compared to a sequential picture stimulus. Authors concluded that altering the nature of instructions for constrained tasks altered the detail and length of the sample.

Mackenzie (1999) analyzed picture description tasks to determine typical changes in discourse performance across the lifespan. One hundred eighty nine healthy aging adults between the ages of 40 and 88 were divided into 3 cohorts: middle aged (ages 40-59, $N = 64$), young elderly (ages 60-74, $N = 63$) and old elderly (ages 75-88, $N = 62$). Picture description tasks were completed and performance was analyzed using relevant content, number of words, and occurrences of extraneous material as performance variables of interest. Results indicated that the variables of interest did not significantly vary across age groups. The author noted that discourse samples for all 3 groups had very large standard deviations due to variances in length of output (28-515 word transcripts).

Bortfeld et al. (2001) evaluated how aging affects length of the discourse sample and disfluencies in a picture description task. Interest in this topic stemmed from previous research which suggested that disfluency rates including repetitions, restarts, and fillers increase among older and middle aged speakers (Albert, 1980; Schow, Christensen, Hutchinson, & Nerbonne, 1978). Participants were divided into 48 conversation pairs (16 young pairs, $M = 28:10$; 16 middle aged pairs, $M = 47:11$; 16 older pairs, $M = 67:2$) with one person in each pair assigned to be the director, while the other was the matcher. The authors examined the director's disfluency rates when describing pictures of children to the matcher, who had 12 picture cards and was to determine which picture card they held matched the card the director described. Length of the sample (or total number of words) included filler words along with restarts and repetitions. Results indicated significant differences in mean length of sample with age (older = 566 words, middle aged = 541, young = 399). They concluded that older speakers produce higher disfluency rates (including repeats, restarts, and fillers) than middle age and younger adults when describing pictures.

The influence of age on length of output and informativeness should also be explored using a less constrained task, as these tasks provide less scaffolding. Stories are highly structured, fictionalized, semi-constrained narrative tasks (Heath, 1986). Two story tasks may be used in research: story generation and story retelling. For a story generation task, individuals are given a subject prompt or instructed to look at a wordless picture book and then tell a story based on the event depicted. Story generation tasks provide fewer scaffolds for the participant, making this task more similar to spontaneous communication than story retelling tasks (Liles, 1993). For story retellings, individuals

retell a familiar story, retell a story recently presented to them, or look through a familiar wordless storybook and tell a narrative based upon the pictures. Story retelling is considered a semi-constrained task due to an individual's opportunity to use provided context as a scaffold.

Coehlo (2002) investigated how discourse performance of healthy aging adults is influenced by constraint provided in story tasks. Participants included 47 neurologically intact hospital employees (M = 32, F = 15) ages 16-63 years (*M* = 30.9). Stories were elicited under two conditions: generation and retelling. When completing the story generation, participants were shown a single picture and asked to "Tell me a story about what you think is happening in this picture." It should be noted that Coehlo defined describing a single picture as a story generation, but for the purposes of the present paper, describing a single picture is a picture description task. When completing the story retelling task, participants were shown a filmstrip with no sound and various pictures depicting a story and asked to "Tell me that story." For the purposes of the present paper, review of the filmstrip and production of a story following the viewing is discussed as a story generation task, as the pictures depict an unfamiliar story with no accompanying information. Authors used words per T-unit (smallest word group considered a sentence (Hunt, 1964)) and cohesion as measures of interest. Results indicated that words per T-unit were significantly greater for the picture description task compared to the story generation task, which supports previous findings (see Liles et al. 1989 for reference). However, findings present support for the idea that story generations and single picture descriptions are similarly constraining. Results also indicated that participants demonstrated a significantly higher degree of cohesion in the story generation task.

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Coehlo (2002) concluded that the constraint provided in the story generation task

(multiple frames depicting a story, similar to sequential picture stimuli) may have led

participants to shorter t-units, as this task decreases the likelihood for one to provide extra

or incorrect information. It was further concluded that the story generation task allowed

participants to more easily produce episodes due to the multiple frames provided in the

task.

Cannizzaro and Coehlo (2003) investigated the influence of age and executive

functioning on story grammar abilities. Participants included 46 neurologically intact

adults ages 18-98 ($M = 56.78$, $SD = 27.7$) who completed one story generation task and

one story retelling task. Again, for the purposes of the present study, tasks will be

discussed as a picture description or story generation. Transcripts were analyzed for T-

units and story grammar content. Significant differences were found in the performance

of the older compared to the younger participants, while the performance of middle aged

participants did not significantly differ from either age group. Results indicated that

single picture descriptions produced by older participants included significantly fewer

complete episodes than story generations. Results from the story generation task

indicated that inclusion of irrelevant speech was significantly increased for older

participants when compared to younger participants. Researchers concluded that

discourse changes are more pronounced in the elderly, as stories produced by older

participants were not as informative, accurate, or complete as those produced by younger

adults.

The influence of age on length and informativeness of discourse samples has also

been investigated using unconstrained tasks, such as a recount. A recount is a verbal

reiteration of an event (Heath, 1986). Everyday life experiences may be recounted as episode-like sequences of events (Liles, 1993) and used to create an opportunity for participants to become off topic, as they are similar to conversation. Previous studies suggest that older adults produce longer speech samples when presented with autobiographical tasks, or recounts (James et al., 1998; Mackenzie, 1999; Thorton & Light, 2006). From the previously discussed study, James and colleagues (1998) investigated how aging relates to length and production of off topic speech in unconstrained discourse samples. Results indicated that when presented with an unconstrained task, older adults produced significantly longer samples. Results also indicated a significant increase in the proportion of off topic speech produced by older adults. They concluded that off-target utterances were specific to situations in which personal information or experiences were transmitted.

Thorton and Light (2006) reviewed the literature focused on discourse and aging. They reported that research indicates older adults generate longer responses as compared to younger adults when answering questions about their lives or describing personal experiences. Furthermore, authors indicated that as much as 20% of a personally related discourse sample elicited from of an adult over 60 years of age contains extreme off-target verbosity (Arbuckle & Pushkar Gold, 1993; Gold, Andres, Arbuckle, & Schwartzman, 1988; Pushkar Gold & Arbuckle, 1995).

In the previously described study by Mackenzie (1999) conversational exchanges were also examined to determine the effects of age on discourse performance. Although this study included conversation rather than explicitly asking for recounts, it should be noted that participants were asked to *recount* everyday topics such as weather,

employment, holidays, health, day to day activities, and family much like the open ended topics used for recount tasks. The examiner rated conversational interactive parameters (conversational initiation, turn taking, verbosity, topic maintenance, and referencing) based on a 1-5 scale (with 1 representing "abnormal" or "inappropriate" and 5 representing "normal"). Results indicated that the performance of those in the old elderly group was significantly different than the performance of those in the middle aged and young elderly groups. Results indicated that those in the old elderly group were significantly more inclined to poor topic maintenance, poor turn taking, verbosity, and the production of unclear references when in conversation. The authors concluded that changes in conversational style began to be seen in the young elderly group, resulting in violations of appropriate conversational rules.

Summary

Collectively, these studies provide support for the use of listener perceptions and self-ratings of communication style in research. Listener perceptions have been used to explore listener perceived effects of goals for communication, gender, and age on communication style. Self-perception has been measured using questionnaires to determine how adults perceive their communication competence and how adults perceive effects of gender on communication style. Regardless of how communication style is rated, communication style is measured in the context of discourse. De-Fina and colleagues (2006) have shown a relationship between language discourse and identity, making discourse a clinically useful tool for sampling communication style. Studies above collectively indicated that age and task constraint affect discourse performance. Of interest to the present study is the relationship between self-perception of communication

style and discourse performance, and how this relationship changes with age and task. Self-rating of communication style considers one's perception of communication traits and is not an indication of the degree of agreement between self-rated communication style and quantifiable measures of output. An understanding of how communication traits relate to communication performance must be reached. Therefore, *the purpose of the present study is to explore the accuracy of healthy aging adults' self-rating of communication style, as measured by quantifiable measures of discourse performance.*

The following chapter outlines methods for the current study.

Chapter Three: Methods

Participants

Data for this study were taken from a larger study investigating discourse processing in healthy adults across the lifespan. Data from 90 participants were randomly selected across three cohorts: 20-29 year olds in the young group (YG), 40-49 year olds in the middle aged group (MG), and 60-69 year olds in the older group (OG). Each cohort included 30 participants, with equal numbers of males and females. Table 3.1 summarizes the demographic variables of interest.

Participants were required to meet the inclusion criteria set for the larger study which included: (1) self-reported native English speaker (2) no self-reported history of a neurological condition (i.e.- stroke) or previous head injury; (3) no self-reported history of cognitively deteriorating conditions (i.e.- Alzheimer's, Parkinson's) and a score of 29 or above on the *Mini-Mental Status Examination* (Folstein & Folstein, 2002); (4) no depression at the time of participation as indicated by a score of 0-4 on the Geriatric Depression Scale- Short Version (Yesavage, 1988) (5) functional hearing abilities measured by the CID List of Everyday Speech (Davis & Silverman, 1970); and (6) functional visual abilities measured by passing a vision screening (Beukelman & Mirenda, 1998).

Experimental Procedures

Following consent, trained graduate assistants individually tested participants across two sessions, each lasting approximately one and a half hours. One session was completed for cognitive testing and one for collection of language samples, with the order of sessions randomized and counterbalanced. For the cognitive session, participants

completed standardized tests measuring memory and attention. During the discourse session, participants completed eleven tasks: 4 picture descriptions, 2 story tellings, 3 recounts, and 2 procedural descriptions. Task order was randomized and counterbalanced across participants. Only data from portions of 3 discourse tasks were considered for analyses in the present study.

Discourse Tasks

To investigate the relationship between self-perceived communication style and discourse, data from one picture description, one story telling task, and one recount were analyzed. Prior to the completion of each type of task, scripted directions were read to participants and an example of the task stimulus was provided.

The four picture description stimuli from (Nicholas & Brookshire, 1993) included two single pictures and two, six-framed picture sequences. For the present study, a sequential picture stimulus was selected for analysis as sequential picture stimuli have been shown to elicit more detailed language productions as compared to single pictures since clear settings, characters, and initiating events with subsequent actions are depicted (Wright, Capilouto, Wagovich, Cranfill, & Davis, 2005). In general, sequential picture stimuli are thought to provide a higher level of constraint and scaffolding when compared to single pictures (Capilouto, Wright, & Wagovich, 2005). In contrast, language samples elicited from single pictures tend to be characterized by a listing of events without story-like connections (Wright & Capilouto, 2009). "Argument" and "Directions" were the two framed picture stimuli used in the larger study. Only data from "Argument" were selected for analysis in the present study, as it was thought to include clearer images compared to "Directions." "Argument" depicts a disagreement between a husband and wife. The first

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frame illustrates the beginning of the fight, with the woman pointing at the man and yelling at him. Subsequent frames show the woman leaving, the man feeling remorse, and finally the woman returning after slamming the family car into a tree (See Appendix A).

To explain the task, the examiner placed the Cookie Theft picture (Goodglass & Kaplan, 1983) (See Appendix B) from the Boston Naming Test (Kaplan, Goodglass, & Weintraub, 1983) in front of the participant and read the following script: *"Let's look at this picture. I am going to tell you a story with a beginning, a middle and an end. 'A little boy is trying to get a cookie from the cookie jar. He wants one for his sister also. He climbed on the stool to get the cookie and is about to fall. His mother is not paying attention to anything that is going on. She is staring out the window while the water in the sink is overflowing.'"* Demonstration of the task was followed by a prompt, *"Now it is your turn. Take a minute to look at this picture. When you are ready, tell me a story with a beginning, middle, and end."* (See Appendix B). If participant spoke for less than 15 seconds, they were prompted with *"Is there anything else you can tell me?"*

Participants in the larger study completed two story telling tasks, which required participants to tell stories derived from wordless picture books, "Good Dog Carl" (Day, 1985) and "Picnic" (McCully, 1984). "Good Dog Carl" depicts a sequence of events, with time and space not critical to the story. "Picnic" was selected for analysis in this study, as the story includes both spatial and temporal content so that a richer context is available for the language sample (See Appendix C). "Picnic" includes no text other than the title and depicts a mouse family set to go on a picnic. The story begins with the mouse family gathering into a truck and driving to their destination, when the truck hits a rock and throws the baby mouse and her stuffed animal onto the street. The truck

continues and the story teller is then presented with pictures from the family picnic as well as pictures of the adventures the baby mouse has on her own. Finally, both story lines come together, as the mouse family searches for and find the baby mouse. To explain the task, the examiner read a script using the wordless picture book, *The Great Ape* (Krahn, 1978) (See Appendix D). Demonstration of the task was followed by a prompt, *"Now it is your turn. Look at this book and when you are ready tell me the story that goes with the pictures."*

Participants in the larger study completed three recounts, which included describing their weekend, vacation, and Christmas (or last holiday). Only data from the recount "vacation" were selected for analysis in this study. Vacation was selected for analysis from a pragmatic standpoint. Participants typically have more interest in relaying events from a vacation, but were more inclined to list events when asked to describe the previous weekend or most recent holiday. The examiner read the following script: *"I am going to tell you about a recent experience. Let me tell you about my Spring Break. My family and I took a trip to Daytona Beach, Florida. There were five of us. We drove and it took us 20 hours to get there. We spent the days lying on the beach getting a sun burn and at night we went out for dinner and then played Putt-Putt. We had a great time!"* Demonstration of the task was followed by a prompt, *"Now it is your turn. Tell me what you did on your last vacation."* If participants spoke for less than 15 seconds, they were prompted with *"Is there anything else you can tell me?"*

Language Transcription and Reliability

Language samples for all tasks were orthographically transcribed from audio recordings by trained graduate research assistants. Ten percent of samples were randomly

selected for a second transcription to determine intra-rater and inter-rater reliability for word-by-word agreement. Reliability was calculated based on the following formula: (total agreements / [total agreements + total disagreements] X 100). Intra-rater and inter-rater agreement were both above 90 percent. Ten percent of samples were randomly selected for determining intra-rater and inter-rater reliability for calculating %IU and TNW. Reliability was subjected to the following formula: 100-[Δ IU count/(total agreements + total disagreements)]. Intra-rater and inter-rater agreement were >90% for both measures.

Language Analysis

Total number of words (TNW) for each task was calculated using rules described by (Nicholas & Brookshire, 1993), which stated that unintelligible words, made-up words, partial words and fillers (non-words such as um, uh) are not considered words. Commentary beginning or ending the task, such as "that's it" or "the end," was not counted toward TNW, but commentary was counted throughout the transcript when in the body of the task (Nicholas & Brookshire, 1993). The following rules were applied to all remaining words: whole words and acronyms were counted as one word, and contractions were counted as two words (e.g. - can't) as well as shortened words (e.g. – "kinda" was counted as the words 'kind of').

After eliminating commentary, words were evaluated for informativeness and considered an "information unit" (IU) if it was intelligible, relevant, accurate, and informative in relation to the stimulus (Dijkstra, Bourgeois, Allen, & Burgio, 2004; Marini, Boewe, Caltagrone, & Carlomagno, 2005; Nicholas & Brookshire, 1993; Shadden, 1997; Tomoeda, Bayles, Troddet, Azuma, & McGeagh, 1996). Counting TNW

and IUs provides for calculation of the percentage of information units (%IU) of a sample, or the percentage of words in a sample that carry relevant and accurate information (Marini, Boewe, Caltagirone, & Carlomango, 2005). Regardless of whether a speaker uses a high low or TNW, a high %IU denotes that their sample was informative and accurate. In contrast, a low %IU would be indicative of increased off topic speech, or content that is irrelevant, inaccurate, or unintelligible. TNW and %IU for each task were considered the outcome variables of interest to examine against self-ratings of communication style.

<center>*Communication Style*</center>

Participants completed the Communication Style Checklist (Christensen, S., Wright, H., Ross, K., Katz, R., & Capilouto, G., 2009), a questionnaire used to gather self-ratings of one's typical communication style. This rating is the participant's self-perception of their communication style. The questionnaire includes fourteen questions scored via a five-point Likert scale (see Appendix E). For this study, two questions (questions 6 and 7) were used for analysis. These questions were selected because of their relation to self-perception and talkativeness. Item six read, "After someone has asked me a question, I realize I have gone on and on for some time!" Item seven read, "I like to use 10 words even when 2 will do!" Participants self-rated communication style using the Likert scale (none of the time (1), some of the time (2), half of the time (3), most of the time (4), and all of the time (5)). The mean of the two responses was used to determine group placement, with a higher mean score indicating a more talkative or gregarious self-perceived communication style and a lower mean score indicative of a quiet or reserved self-perceived communication style (Capilouto & Wright, 2008; Christensen et al., 2009).

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Participants with a mean score of 3 or above were placed in the talkative group, while those with an average of 2.5 or below were placed in the reserved group (see Table 3.2).

Statistical Analyses

The relationships among age, indicators of performance (TNW, %IU), and self-perception of communication style were analyzed using PASW Statistics 18 (SPSS Inc., 2001). To answer question one, two independent t-tests were conducted to determine if a relationship existed between self-perceived communication style and the quantitative measures of discourse performance (TNW and %IU). To answer the second research question, two, two-way factorial ANOVAs were conducted to determine the effect of age and self-rating of communication style on quantitative measures of discourse performance (both TNW and %IU). A significance level of alpha = .05 was used for all analyses. The following chapter provides the results of the research questions.

Chapter Four: Results

Preliminary Analysis for Question 1

To answer Question 1 participants were divided into 2 cohorts based on self-rating of communication style (talkative or reserved), regardless of age. Preliminary analyses were conducted to ensure that years of education was not a contributing factor to results (see Table 3.2). Mean education level was 16.06 ($SD = 2.74$) years for the talkative group and 15.42 ($SD = 2.54$) years for the reserved group. A one-way ANOVA indicated no significant difference between self-rating cohorts with respect to years of education, $F(1, 88) = 1.250, p = .267$. Therefore years of education was not considered in subsequent analyses.

Research Question 1a: Is there a difference in TNW for individuals who self-rate

as talkative versus reserved for the unconstrained task, regardless of age?

An independent variable *t*-test was conducted to examine the difference in mean TNW for talkative participants and mean TNW for reserved participants in an unconstrained task. The unconstrained task was selected for initial analyses as it was hypothesized that an unconstrained task would most likely result in differences in discourse performance (differing values of TNW) between the two groups, if differences did exist. Results indicated no significant difference in mean TNW for the unconstrained task between the talkative and reserved groups, $t(88) = .996, p = .322$ (see Table 4.1, see Figure 1).

Post hoc Analysis for Question 1a

Post hoc analyses were conducted to investigate the relationship between TNW and communication style for tasks of varying constraint. Independent samples *t*-tests

were used to examine the difference in mean TNW for talkative participants and mean

TNW for reserved participants, regardless of age, in a semi-constrained (story telling) and

a constrained task (picture description). Results indicated a significant difference between

the talkative and reserved groups for the semi-constrained task, $t(88) = 2.801$, $p = .006$

(see Table 4.4). Talkative participants ($M = 568.79$, $SD = 221.49$) had a significantly

higher TNW than reserved participants ($M = 458.58$, $SD = 151.02$) (see Figure 2). Results

indicated no significant difference in mean TNW for the constrained task between the

talkative and reserved groups (see Figure 3).

A series of post hoc analyses followed to examine the difference in mean TNW

for each task (unconstrained, semi-constrained, and constrained) between the talkative

and reserved groups *within age cohorts* (See Table 3.3). For example, the relationship

between TNW for young talkative vs. young reserved participants was examined across 3

tasks: unconstrained, semi-constrained and constrained. Similar analyses were conducted

for the middle-aged and older groups. Preliminary analyses were conducted to ensure that

years of education was not a contributing factor to results. One-way ANOVAs indicated

no significant difference between self-rating cohorts and age, with respect to years of

education for 20 year olds, $F(1, 28) = .080$, $p = .780$, 40 year olds, $F(1, 28) = 3.039$, $p =$

.092, and 60 year olds, $F(1, 28) = .309$, $p = .583$. Therefore years of education was not

considered in subsequent analyses. No differences in TNW were significant (see Figures

4-8, 10, and 12). However, the relationship between older adults' ratings of

communication style and TNW produced approached significance for both the semi-

constrained and constrained tasks. For the semi-constrained task, the difference between

mean TNW produced by the older talkative group ($M = 649.27$, $SD = 212.91$) and mean

TNW produced by the older reserved group ($M = 509.27$, $SD = 171.49$) approached significance $t(28) = 1.983$, $p = .057$ (see Table 4.6, see Figure 9). Older talkative participants produced a greater TNW than older reserved participants. In addition, for the constrained task, the difference between the mean TNW produced by the older talkative group ($M = 142.40$, $SD = 57.12$) and the mean TNW produced by the older reserved group ($M = 106.00$, $SD = 48.46$) approached significance, $t(28) = 1.882$, $p = .070$ (see Table 4.9, see Figure 11). Older talkative participants produced a greater TNW than older reserved participants.

Research Question 1b: Is there a difference in %IU for individuals who self-rate as talkative versus reserved for the unconstrained task, regardless of age?

An independent variable *t*-test was conducted to examine the difference in mean %IU for talkative participants and mean %IU for reserved participants in an unconstrained task. Results indicated no significant difference in mean %IU for the unconstrained task between the talkative ($M = 91.50$, $SD = 5.57$) and reserved groups ($M = 90.43$, $SD = 5.93$); $t(88) = .844$, $p = .401$ (see Table 3.1, see Figure 13).

Post hoc Analysis of Question 1b

Post hoc analyses were conducted to investigate the relationship between %IU and communication style for tasks of varying constraint. Independent samples *t*-tests were used to examine the difference in mean %IU for talkative participants and mean %IU for reserved participants, regardless of age, in a semi-constrained (story telling) and a constrained (picture description) task. No differences were significant (See Tables 4.3 and 4.5; see Figures 14 and 15). A series of post hoc analyses were conducted to examine the difference in mean %IU for each task (unconstrained, semi-constrained, and

constrained) between the talkative and reserved groups *within age cohorts*. No differences were significant (see Tables 4.2, 4.4, and 4.6; see Figures 16-24).

Preliminary Analysis for Question 2

To answer Question 2, participants were divided into 3 cohorts based on age: young, middle aged, and older. Equal numbers of male ($n = 45$) and female ($n = 45$) participants were included in this study, with equal numbers of male and female participants within each cohort. Preliminary analyses were conducted to ensure that years of education was not a contributing factor to results. Mean education level was 15.97 (*SD* = 1.47) years for the young group (YG), 15.50 (*SD* = 3.19) years for the middle aged group (MG), and 15.50 (*SD* = 2.92) years for the older group (OG). A one-way ANOVA indicated no significant difference between age cohorts with respect to years of education, $F(2, 87) = .313$, $p = .732$. Therefore years of education was not considered in subsequent analyses.

Research Question 2a: Is the relationship between self-ratings of communication style (talkative versus reserved) and TNW produced in an unconstrained task influenced by age?

An analysis of variance was conducted to answer question 2a. To meet the requirements of an ANOVA, a test of normal distribution was conducted. A Shapiro-Wilkes test of normality indicated that data for TNW were not normally distributed, $p = 0.000$, but were instead severely skewed right. This is problematic because ANOVAs assume that the residuals have a normal distribution. Correcting this involved transforming the response variable using the natural logarithm (y'= ln(y)) of the TNW values to create a normally distributed data set linear in nature. The new variable value

was used to run a two-way ANOVA. A two-way ANOVA was conducted to examine how age influenced the difference between self-rating of communication style and mean TNW for an unconstrained task. Within and between factors were self-rating of communication style and age, respectively. No significant interaction was observed suggesting that there was no differential effect between talkative and reserved cohorts across age groups, $F(2, 89) = .518$, $p = .597$ (see Table 4.3). Therefore, age did not significantly influence the relationship between self-rating of communication style and TNW in the unconstrained task (see Figure 25).

Research Question 2b: Is the relationship between self-ratings of communication style (talkative versus reserved) and %IU produced in an unconstrained task influenced by age?

An analysis of variance was conducted to answer question 2b. To meet the requirements of an ANOVA, a test of normal distribution was conducted. A Shapiro-Wilkes test of normality test indicated that data for %IU were not normally distributed, $p = 0.000$ (inferior to $p = 0.05$). The variable was transformed using the arcsine of %IU, and the new variable value was used to run the two-way ANOVA. A two-way ANOVA was conducted to examine how age influenced the difference between self-rating of communication style and mean %IU for an unconstrained task. Within and between factors were self-rating of communication style and age, respectively. Results approached significance for a difference between cohorts for self-rating of communication style and %IU, $F(2,89) = 2.784$, $p = .068$ (see Table 4.3). However, age did not significantly influence the relationship between self-rating of communication style and %IU for the unconstrained task (see Figure 26).

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Post hoc Analysis of Questions 2a and 2b

Post hoc analyses were conducted to investigate how age influenced the difference between self-rating of communication style and mean TNW and %IU for a semi-constrained and constrained task. No findings were significant (see Figures 27-30).

Chapter Five: Discussion

The purpose of the current study was to investigate the accuracy of self-ratings of communication style of healthy aging adults' (ages 20-69), as indicated by quantifiable measures of discourse performance. Accuracy was explored in the context of language production tasks of varying constraint. It was hypothesized that participants self-rated as talkative would produce a greater number of words with decreased informativeness as compared to participants self-rated as reserved regardless of task. It was further hypothesized that age, self-rating of communication style, and discourse performance would be related. Results provided limited support for the hypotheses. What follows is a discussion of results, limitations, future directions, and clinical implications.

Results indicated a significant difference in mean TNW between the talkative and reserved groups for the storytelling (semi-constrained) task. Regardless of age, adult communication performance on the story telling task and self-rating of communication style by participants was related, with talkative participants producing a greater TNW. However, results indicated no significant difference in mean TNW between the self-rated talkative and self-rated reserved groups for the recount (unconstrained) or picture description (constrained) tasks. Samples indicated that adults self-rated as talkative produced discourse of comparable length to that of self-rated reserved adults. Therefore self-ratings of communication style may need to be considered within the context of the task. Surprisingly, no significant differences existed for %IU for any task, regardless of age. The trend for the recount task indicated that the talkative group produced a slightly greater TNW as compared to the reserved group. In contrast, performance related to %IU was similar for both groups, indicating that speakers may produce longer discourse

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samples without a concomitant increase or decrease in informativiveness. No clear trend was present for the story telling or picture description tasks. Given that there were only significant group differences (talkative versus reserved groups) in discourse performance as measured by TNW for the storytelling task, results provided limited support for the hypotheses that talkative participants would have a significantly higher mean TNW and significantly lower %IU as compared to reserved.

When age was not considered, a difference in the TNW produced by talkative and reserved participants was found for the storytelling task. Talkative participants produced a significantly greater TNW, possibly due to the nature of the storytelling task. "Picnic" is a story which contains temporal and spatial elements, which might lead talkative participants to embellish the story beyond simply listing events, while reserved participants might be more inclined to relay the story with minimal detail beyond the pictured events. Furthermore, storytelling tasks inherently lead to the production of a longer language sample, sue to the fact that the stimulus is several pages long and includes story elements such as a conflict and a resolution. Findings further indicate that differences between talkative and reserved participants might be due to the nature of the task due to non-significant findings for the recount and picture description tasks. For example, the recount selected for analysis in the present study was simple, without a problem or resolution, limiting the likelihood that participants would embellish their response.

Findings from the present study indicated that adults of all ages produce a similar TNW regardless of self-rating when completing discourse tasks of varying constraint. Studies by Shewan and Henderson (1988) and Cooper (1990) found that length of the

discourse sample elicited by picture description tasks did not vary based upon age. However, the test-retest reliability measure demonstrated that length of discourse samples, with the exception of samples collected from older adults, was not a stable measure. Older adults produced samples of comparable length over several trials, while length of discourse samples of younger adults was highly variable. Furthermore, results from the current study are not significant, but the trends that emerged are consistent with other studies demonstrating that the discourse of older adults is lengthier than that of younger adults (James et al., 1998; Mackenzie, 1999; Thorton and Light, 2006). Results from the James et al. (1998) research indicated that when presented with an unconstrained task, older adults produced significantly longer samples. Mackenzie (2000) also concluded that older adults are more inclined to verbosity, particularly when tasks were less constraining.

For the storytelling and picture description tasks, mean %IU for older participants on more constrained tasks was less than %IU produced by young participants. Findings suggest that younger participants use context and constraint to their benefit, and therefore provided more relevant information than older adults on similar tasks. Previous research suggested that older adults do not use context to their advantage as well as younger adults (Capilouto et al., 2005; James et al., 1998). Results from the current study are also consistent with findings from Cannito et al. (1988) and Ultowska and Chapman (1991), who found that when presented with more complex tasks (or those with greater constraint), the information conveyed decreased for older populations. Task complexity was interpreted as a function of constraint, with more constraint increasing the difficult of the task, as more information should be conveyed for the message to be accurate and

informative. Clinicians routinely ask clients to complete picture description tasks as a part of an assessment. Clinicians must consider that a younger adult producing a small %IU is of far more concern that an older individual producing a small %IU when given a picture description task, as younger individuals should better use information provided through the context of the task.

Several studies have explored aging and informativeness, with findings often contradictory. Results from the current study are consistent with findings of Ultowska et al. (1985) who reported preservation of superstructural (organizational and informational) elements of discourse across the lifespan for unconstrained tasks. For the unconstrained task in the present study, %IU produced by older participants was not significantly different than %IU of younger or middle aged participants, indicating that informational elements were intact and did not increase with age for this group of participants.

A possible explanation for the absence of significant findings may be the extent of variability within and across cohorts as indicated by large standard deviations on the output measures of interest. Variability is presumed to reflect age-related changes in one's socialization, environment, economic situation, health, and physiological and cognitive status, all of which can affect communication (Shadden, 1988). Large standard deviations on output measures of interest were present for all three cohorts, similar to the findings reported by Mackenzie (2000). Mackenzie noted that variability in discourse length often exists within age cohorts, with samples ranging from 28 to 515 words in her study. Findings indicate that greater variability is a result of age. Within cohort variability, particularly within the 40 and 60 year old cohorts, is suspected to be related to the early presence of mild cognitive impairments (Balota et al., 2010; Jensen, 2012)

which may explain the finding that variability is greatest among older participants (Mackenzie, 2000). Another possible reason for large group variability observed for TNW and %IU might be that group placement as talkative or reserved based on the average of just two responses to communication style checklist. Averaging responses from two questions might not have provided enough of a valid indication of communication style. Participants might have been placed in a different group had more questions been considered in calculating the mean. The selected questions for classification may also have influenced group placement. The question which read "After someone has asked me a question, I realize I have gone on and on for some time!" was the only question targeting talkativeness, while "I like to use 10 words even when 2 will do!" targeted informativeness. Upon reflection of the Communication Style Checklist (Capilouto & Wright, 2009), it might have been beneficial to include participant responses to question 8, which read "I love to argue." It is estimated that a person inclined to argue would be one willing to speak longer than a reserved individual, as they are driven to prove a point. Question one, which read, "My family and friends would describe me as someone who can 'talk to anybody about anything'" also considers talkativeness, as someone described by others as gregarious tends to be more talkative. Question twelve measured informativeness, reading "When completing the language tasks it was important to me that I stayed on topic and that my stories were well organized." Additional questions, such as questions discussed above, might have yielded a more valid indication of one's communication style.

Study Limitations and Future Directions

Future studies should include a greater number of questions for analyses when determining participant's self-rating of communication style. Additional questions might vary in how they are written, with some more direct to ensure that responses indicate what the participant actually intended to portray. Perhaps if questions were more direct, self-rating responses might be more accurate for all tasks. For instance, questions for the present study did not state what they were measuring (talkativeness or informativenss) but more direction questions, such as "I would describe myself as a talkative person" or "What I say is informative," might result in a more direct interpretation of one's communication style. Direct questions could also act as a control to determine if other responses for questions related to talkativeness are similar (e.g. – similar ratings across several questions related to talkativeness indicates a more competent rater), thus it may be concluded that the participant understood the questions and has deeper insight into their communication style.

Future studies might also consider the effects of neutral responders, or those selecting "half of the time" on questions of interest, as one's placement based upon mean self-rating of communication style might also have been compromised by the inclusion of neutral responses. A possibility for maximizing differences across self-rating groups might be to exclude participants self-rated as a "3" which correlates with the answer "half of the time" on the Communication Style Checklist (Christensen, et al., 2009). Inclusion of only liberal raters (those self rating as "all of the time" or "none of the time") would not be an accurate depiction of the general population's communication style trends either. Therefore, if future studies include participants with neutral responses, those

participants might be included as a self-rated control group to compare with "talkative" and "reserved" participants. Inclusion of all raters divided into three groups would possibly yield a clearer picture of the relationship between self-ratings of communication style and discourse performance for talkative and reserved individuals, and would also allow for conclusions about typical communication style for adults less definitive with their self-ratings.

The present study elicited discourse productions in an unconstrained recount task. However, the nature of the vacation prompt may have limited the richness of the sample. During a recount task, participants might be inclined to relay heaps of information versus relaying the relationships between persons and events. Asking a participant to describe a time when they had a problem with someone would likely lead to output with a story-like structure, including a person, a problem that must be resolved, actions to solve the problem and a resolution. However, the selected vacation recount might have restricted participants, as the prompt itself was limiting to the events that occurred. Asking a participant to discuss a vacation could result in a temporal listing of the events that occurred. Events of daily life are often sequential and lack an initiating even, problem, and resolution all required for a story-like recount. Therefore, recounting a vacation will result in a listing of events, lacking the directionality of a story. This may have provided a skewed view of participants' natural language by giving them only one opportunity to speak for the given task.

The high mean education levels in the present study may have acted as a protective measure of cognitive abilities. The use of highly educated subjects may lead to heterogeneity between subjects, limiting the differences in discourse production that

might be present (Ringel & Chodzko-Zajko, 1990). Findings from Mackenzie (2000) indicated that education significantly influences discourse performance, as less educated participants produced shorter outputs with less content when presented with a picture description task. Future researchers should consider completing a similar study with groups of differing levels of education. Education has not been linked to a change in accuracy of self-ratings or a change in communication style, but differences in quantifiable measures (e.g. – TNW and %IU) might be seen from participants from varying educational backgrounds. Therefore, participants with different levels of education should be included as a study population of interest in future research.

Future studies should explore effects of gender on accuracy of self-rating of communication style. Montgomery and Norton (1981) asserted that "information about male/female differences and similarities will help researchers and educators better understand the communication process" (page 132). People tend to believe that women and men speak differently (Crawford, 1995). Research which explores discourse performance between sexes and asks participants to self-rate their communication style would yield valuable information to confirm or discredit stereotypes that women are more talkative than men (Mehl, Vazire, Ramirez-Esparza, Slatcher, & Pennebaker, 2007; Popp, et al., 2003).

The present study included participants in their 20's, 40's and 60's, while excluding the elderly, as findings from previous research indicated that the elderly population produced greater off topic speech when presented with an unconstrained task (James, Burke, Austin, & Hume, 1998; Jensen, 2012; Mackenzie, 2000). However, elderly adults should be included in future studies to determine if self-rating of

communication style is accurately reflected through discourse performance for this population. Including the elderly would be clinically important, as this population is highly represented on clinical caseloads.

Finally, future studies should consider including listener perceptions of communication style. Determining the accuracy of self-ratings and accuracy of listener perceptions for a participant's transcript would allow for researchers to reach conclusions about the relationship between communication style and age, similar to the present study, but would also allow for information about how age biases affect the listener's perceptions. Additionally, input or ratings from the listener collecting the speech sample might be a valuable indicator of listener perception from someone directly involved in the communication exchange process. Furthermore, input from participant spouses would relay valuable information about accuracy of listener ratings from a source that experiences frequent conversational exchanges with the participant. Clinically, clients might not be accurate sources for communication style ratings, but a spouse might give an accurate indication of pre-morbid functioning. Spouses could be the only source able to communicate the client's communication style, as the client's communication skills might be impaired. Therefore, findings concerned with spousal and listener perceptions are clinically valuable.

Clinical Importance

Current clinical approaches to treatment of communication disorders focus on etiology. Deficits are approached in a way which does not consider pre-morbid communication style. For instance, an adult with a reserved communication style prior to their stroke may also be reserved in a group aphasia therapy session, so therapy should be

planned in a way that addresses and accounts for all styles of communication. If clinicians fail to consider a person's communication style, results of therapy might seem skewed or progress limited. However, the client might actually be performing in a way commiserate with their premorbid communication style. A more comprehensive communication style questionnaire is proposed based on the limitations of the current study (see Appendix F). Questions are direct, so that participants may more clearly understand the meaning of the question and provide insight based upon their understanding of the purpose of the question. More direct questions might provide participants with a more self-assured response, thus leading to a more exact self-rating of communication style, however, the scale needs to be tested.

The current study provides useful clinical information regarding the relationship between aging, discourse, and accuracy of self-rating of communication style. Findings from the current study contribute to the growing body of literature about healthy aging adults. Such literature is clinically relevant due to the speech-language pathologist's role in communication maintenance and enhancement of older adults (ASHA Committee on Communication Problems of the Aging, 1988). However, clinicians must first have knowledge of what is defined as typical communication for aging individuals, both healthy and those with acquired communication disorders. Discourse production is often assessed and then treated by speech-language pathologists. During assessment, clinicians must obtain a natural language sample from a patient to determine goals for treatment. It is important to assess discourse production for those with acquired communication disorders, as the disorder affects social interactions and participation in society, both of which are the goals for any communication exchange.

Conclusion

Results of the present study indicate that there is variability in the ability to accurately self-rate communication style in healthy aging adults. Previous findings from studies concerned with communication style, as indicated by length of output and informativeness, have also depicted the variability found in the present study. Variability was present for all ages, with changes in communication style and discourse performance most obvious in older adults. However, findings indicate that older adults are more aware of communication style, as findings from the present study suggest that older adults provide more accurate self-ratings of communication style.

Communications style varies and is wholly individual. Discourse task performance varies based upon communication style, the task presented, and age. Lack of significant results for the present study can be attributed to variability, thus indicating the need for a more precise indicator of communication style and more accurate measures of discourse performance. Communication style measures might be adjusted, so that self-rating questionnaires include less abstract and more direct questions. Discourse measures of communication style might be expanded to include measures of cohesion.

Clinicians must consider the client's communication style when analyzing discourse performance, as one's communication style is individual and should be analyzed based on norms for that individual. Results from the present study were not significant, possibly because the approach to measuring communication style was not individualized to a great enough degree. Future self-rating questionnaires, input from families and listeners, as well as a holistic measure of discourse performance should be

used when determining therapy for an individual. Individual norms, as indicated by self-ratings of communication style and discourse performance should shape therapy.

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Table 3.1

Reported Means and (standard deviations) of Demographic Variables of Interest,

By Age Cohort (n = 30 per cohort)

	YG[1]	MG[2]	OG[3]
M:F	15:15	15:15	15:15
Age	24.40(2.88)	45.13(3.15)	65.90(2.85)
Education[4]	15.97(1.47)	15.50(3.19)	15.50(2.92)
MMSE[5]	55.57(7.07)	53.67(5.16)	55.03(7.28)

[1]Young Group (20 year olds); [2]Middle Aged Group (40 year olds); [3]Older Group (60 year olds); [4]Years of Education; [5]Mini Mental Status Examination Scaled Score

Table 3.2

Reported Means and (standard deviations) of Demographic Variables of Interest,

By Self-Rating Cohorts.

	Talkative[1]	Reserved[2]
Participants	33	57
M:F	8:25	37:20
Age	48.45(17.30)	43.23(17.14)
Education[3]	16.06(2.74)	15.42(2.54)
MMSE[4]	56.24(5.88)	53.89(6.80)

[1]Participants had a mean self-rating ≥ 3 on questions of interest; [2]Participants

had a mean self-rating ≤ 2.5 on questions of interest; [3]Years of Education;

[4]Mini Mental Status Examination Scaled Score

Table 3.3

Reported Means and (standard deviations) of Demographic Variables of Interest,

By Age Cohort and Self-Rating (n = 30 per age cohort)

	TYG[1]	RYG[2]	TMG[3]	RMG[4]	TOG[5]	ROG[6]
M:F	4:5	11:10	2:7	13:8	2:13	13:2
Age	24.67(2.69)	24.29(3.02)	44.78(3.73)	45.29(2.95)	64.93(2.91)	66.87(2.50)
Educ.[7]	16.56(0.88)	16.44(1.59)	17.00(4.00)	15.56(2.96)	15.44(2.24)	16(3.74)
MMSE[8]	55.00(8.75)	55.81(6.46)	55.44(3.64)	52.90(5.58)	57.47(4.98)	52.6(8.49)

[1] Talkative Young Group (20 year olds); [2] Reserved Young Group (20 year olds); [3] Talkative Middle Aged Group (40 year olds); [4] Reserved Middle Aged Group (40 year olds); [5] Talkative Older Group (60 year olds); [6] Reserved Older Group (60 year olds); [7] Years of Education; [8] Mini Mental Status Examination Scaled Score

Table 4.1

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style for Unconstrained Task

	Total Number of Words	Percent Information Units
Self-Rated Talkative (n = 33)	197.06 (185.81)	91.50 (5.57)
Self-Rated Reserved (n = 57)	158.46 (171.95)	90.43 (5.93)

Table 4.2

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style and Age Cohort for Unconstrained Task

	Total Number of Words	Percent Information Units
Cohort 1[1] Talkative (n = 9)	99.22 (87.77)	93.48 (6.55)
Cohort 1 Reserved (n = 21)	128.9 (185.42)	89.34 (7.56)
Cohort 2[2] Talkative (n = 9)	179.89 (163.9)	90.69 (6.26)
Cohort 2 Reserved (n = 21)	148.29 (137.14)	91.13 (5.42)
Cohort 3[3] Talkative (n = 15)	266.07 (218.44)	90.79 (4.54)
Cohort 3 Reserved (n = 15)	213.87 (193.79)	90.95 (3.81)

[1]Young Group (20 year olds); [2]Middle Age Group (40 year olds); [3]Older Group (60 year olds)

Table 4.3

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style for Semi-Constrained Task

	Total Number of Words	Percent Information Units
Self-Rated Talkative (n = 33)	568.79 (221.49)	90.33 (5.62)
Self-Rated Reserved (n = 57)	458.58 (151.02)	91.07 (4.06)

Table 4.4

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style and Cohort for Semi-Constrained Task

	Total Number of Words	Percent Information Units
Cohort 1[1] Talkative (n = 9)	445.89(160.41)	93.10(2.49)
Cohort 1 Reserved (n = 21)	419.71(144.68)	91.52(2.33)
Cohort 2[2] Talkative (n = 9)	557.56(248.78)	92.24(3.45)
Cohort 2 Reserved (n = 21)	461.24(137.19)	92.59(3.87)
Cohort 3[3] Talkative (n = 15)	649.27(212.91)	87.53(6.80)
Cohort 3 Reserved (n = 15)	509.27(171.49)	88.33(5.00)

[1]Young Group (20 year olds); [2]Middle Age Group (40 year olds); [3]Older Group (60 year olds)

Table 4.5

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style for Constrained Task

	Total Number of Words	Percent Information Units
Self-Rated Talkative (n = 33)	131.64 (52.68)	90.05 (5.26)
Self-Rated Reserved (n = 57)	107.53 (44.86)	91.50 (4.98)

Table 4.6

Reported Means and (standard deviations) for Outcome Variables of Interest,

by Self-Rating of Communication Style and Cohort for Constrained Task

	Total Number of Words	Percent Information Units
Cohort 1[1] Talkative (n = 9)	114.89(62.60)	91.03(6.41)
Cohort 1 Reserved (n = 21)	104.76(44.84)	91.29(4.31)
Cohort 2[2] Talkative (n = 9)	130.44(30.64)	90.89(4.61)
Cohort 2 Reserved (n = 21)	111.38(44.21)	92.84(3.55)
Cohort 3[3] Talkative (n = 15)	142.40(57.12)	88.96(5.02)
Cohort 3 Reserved (n = 15)	106.00(48.46)	89.98(7.03)

[1]Young Group (20 year olds); [2]Middle Age Group (40 year olds); [3]Older Group (60 year olds)

Figure 1.

Mean TNW by self-rating of communication style for unconstrained task.
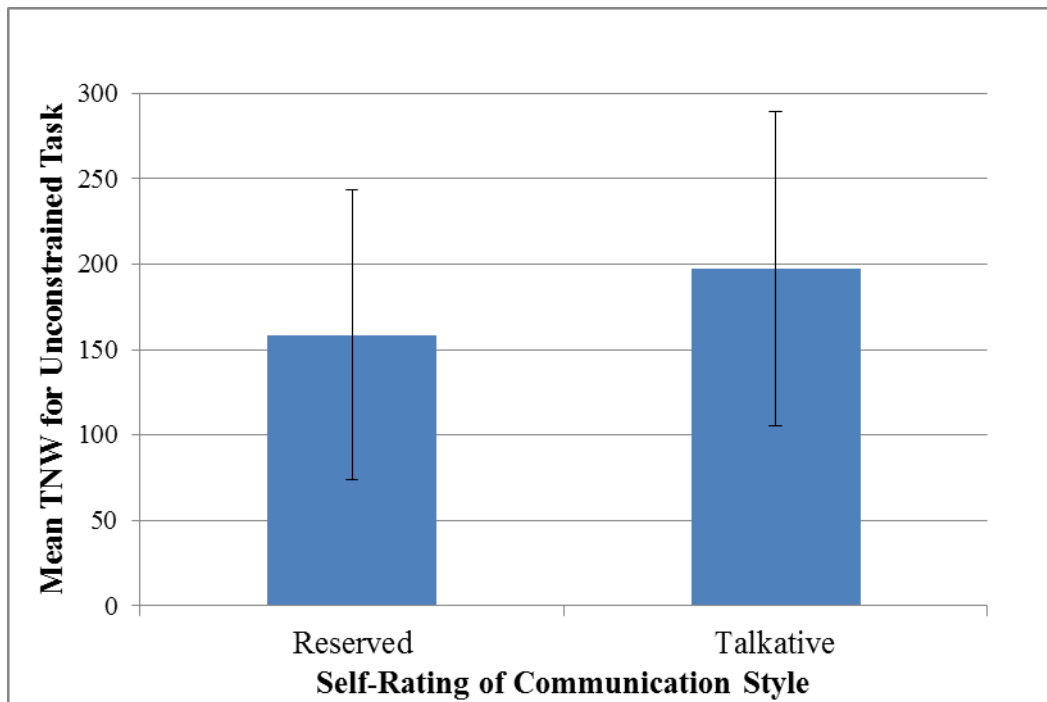
Figure 2.

Mean TNW by self-rating of communication style for semi-constrained task.
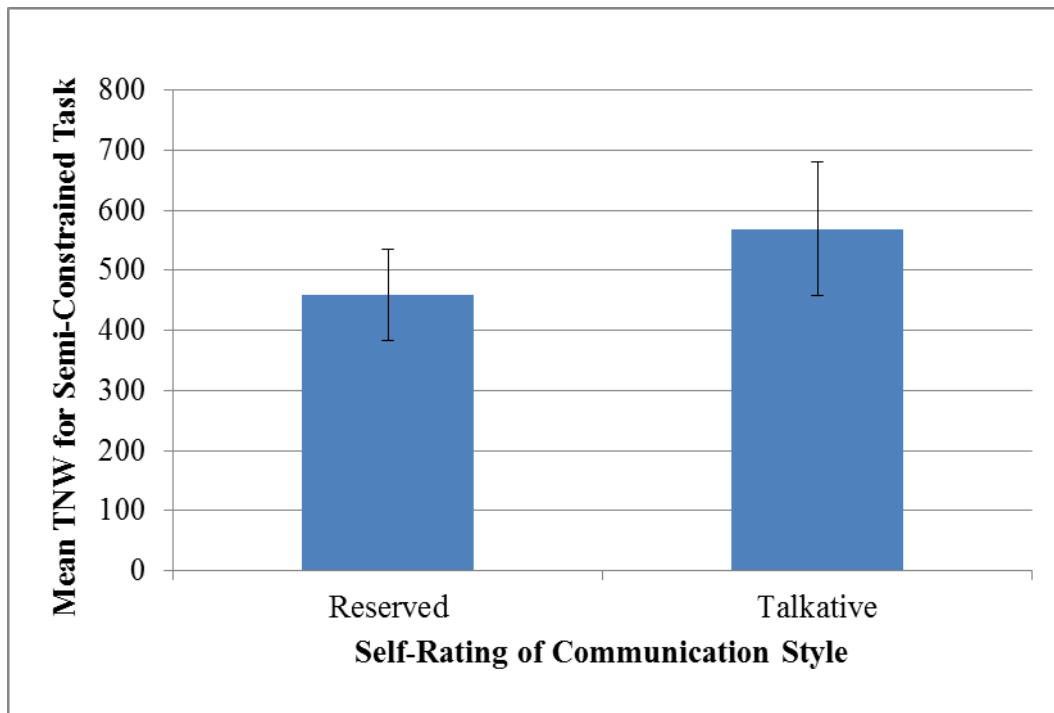
Figure 3.

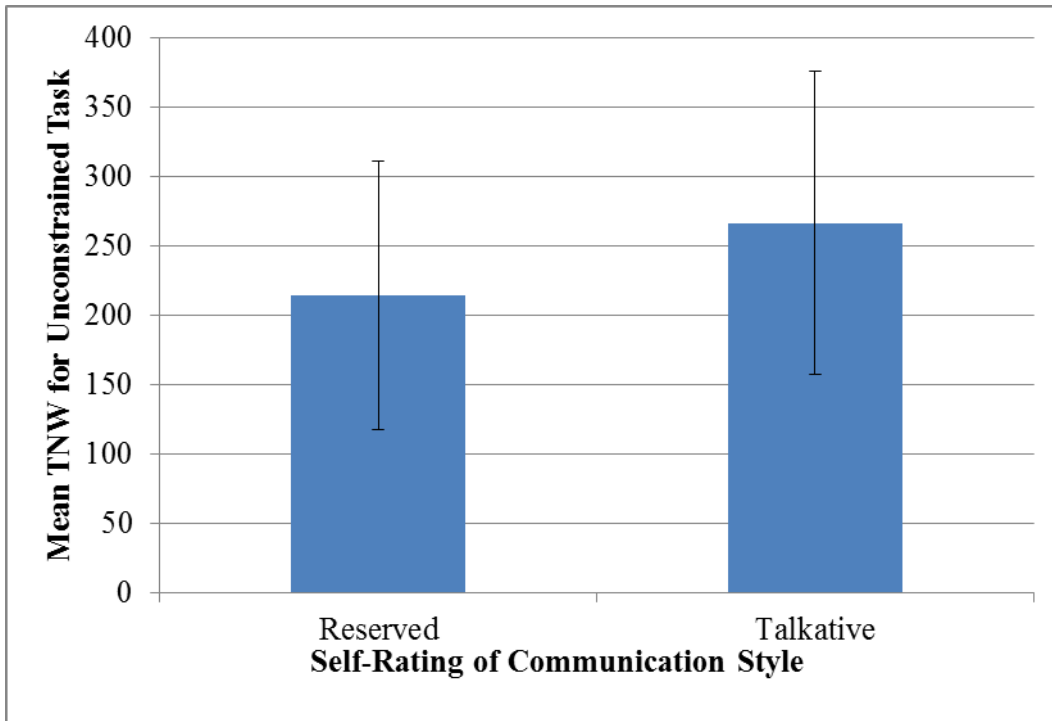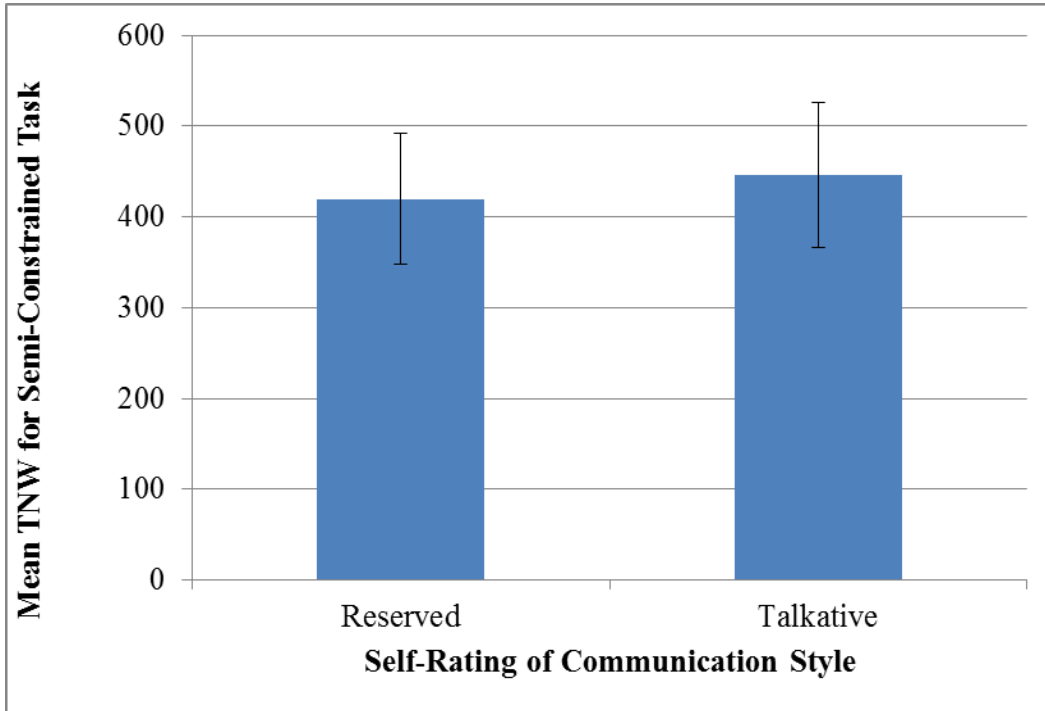Mean TNW by self-rating of communication style for constrained task.
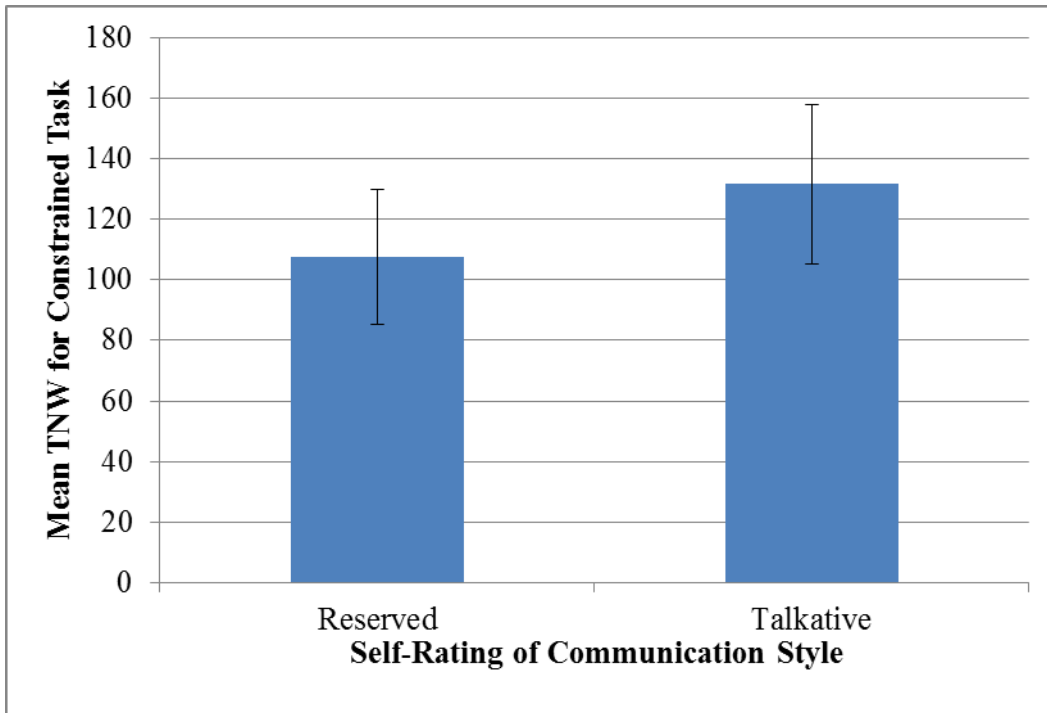
Figure 4.

Mean TNW by self-rating of communication style for young group for unconstrained task.
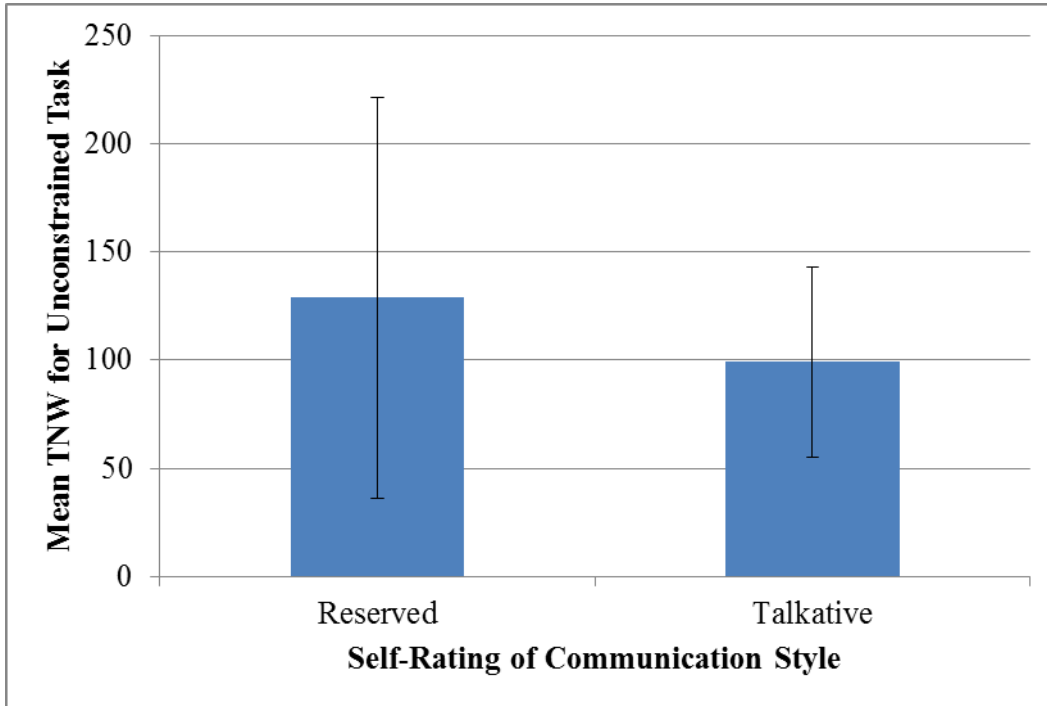
Figure 5.

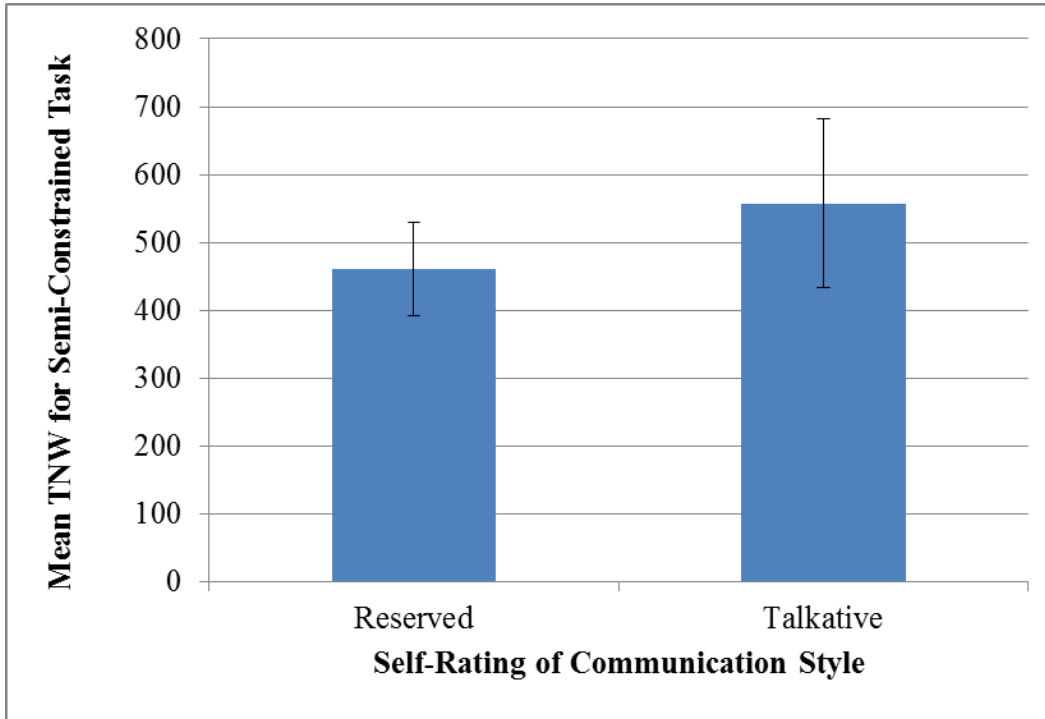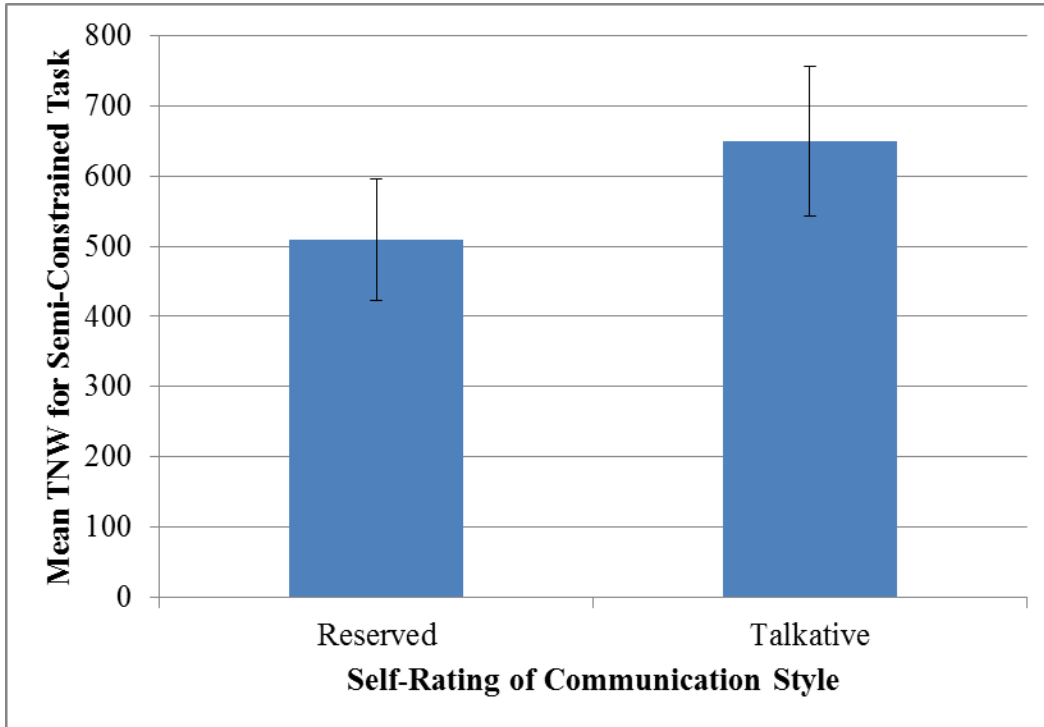Mean TNW by self-rating of communication style for middle aged group for unconstrained task.
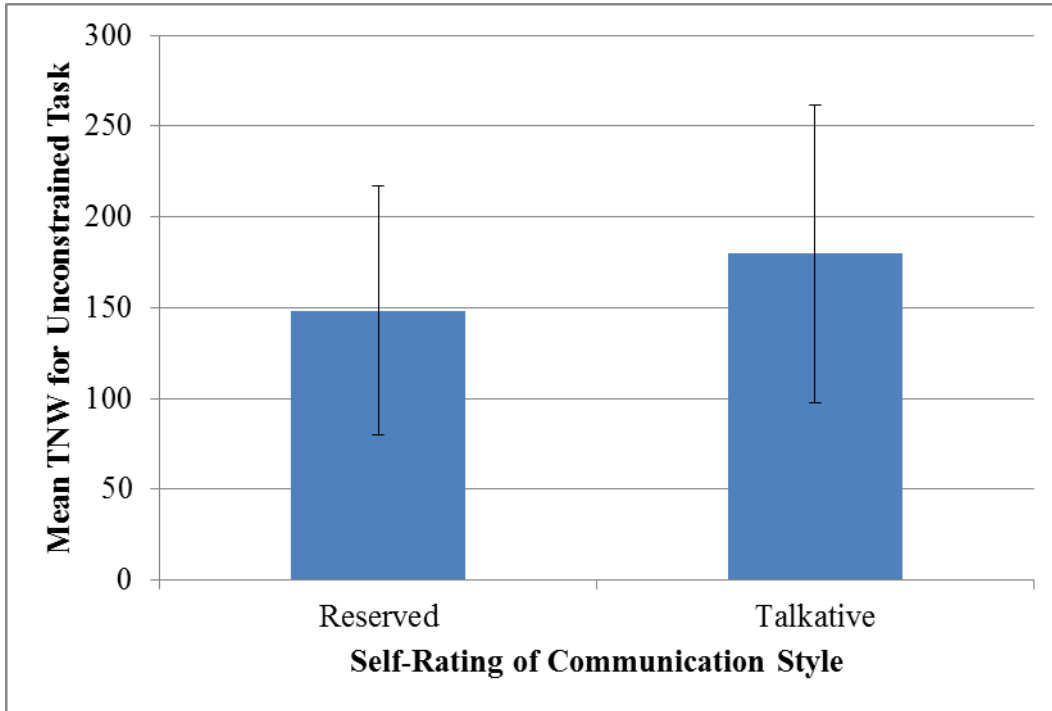
Figure 6.

Mean TNW by self-rating of communication style for older group for unconstrained task.

Figure 7.

Mean TNW by self-rating of communication style for young group for semi-constrained task.

Figure 8.

Mean TNW by self-rating of communication style for middle aged group for semi-constrained task.

Figure 9.

Mean TNW by self-rating of communication style for older group for semi-constrained task.

Figure 10.

Mean TNW by self-rating of communication style for young group for constrained task.
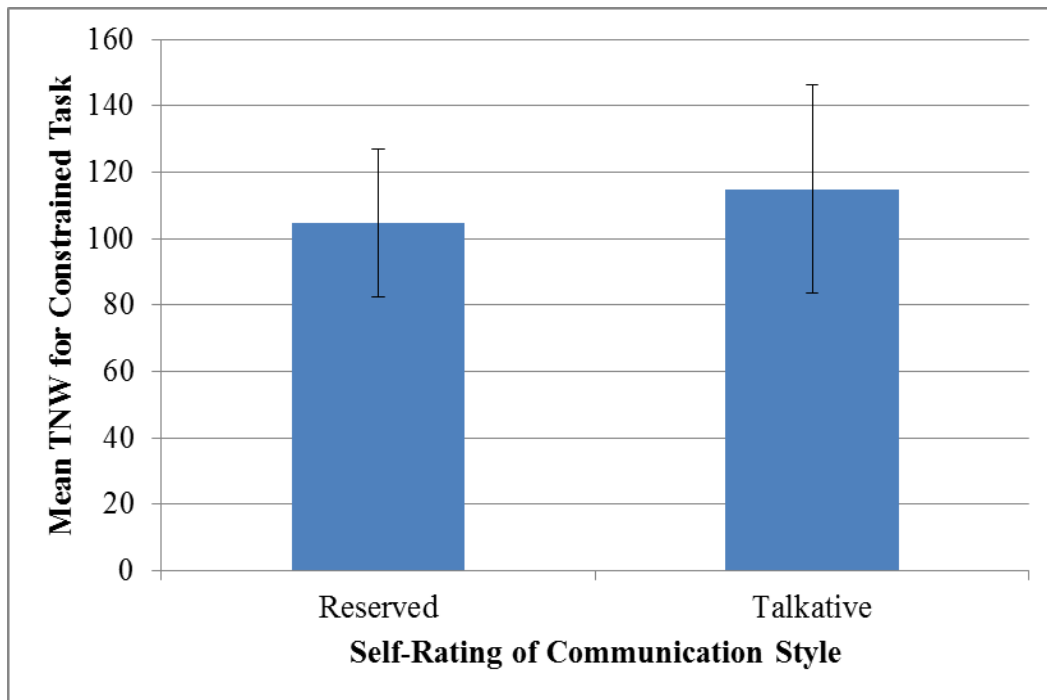
Figure 11.

Mean TNW by self-rating of communication style for middle aged group for constrained
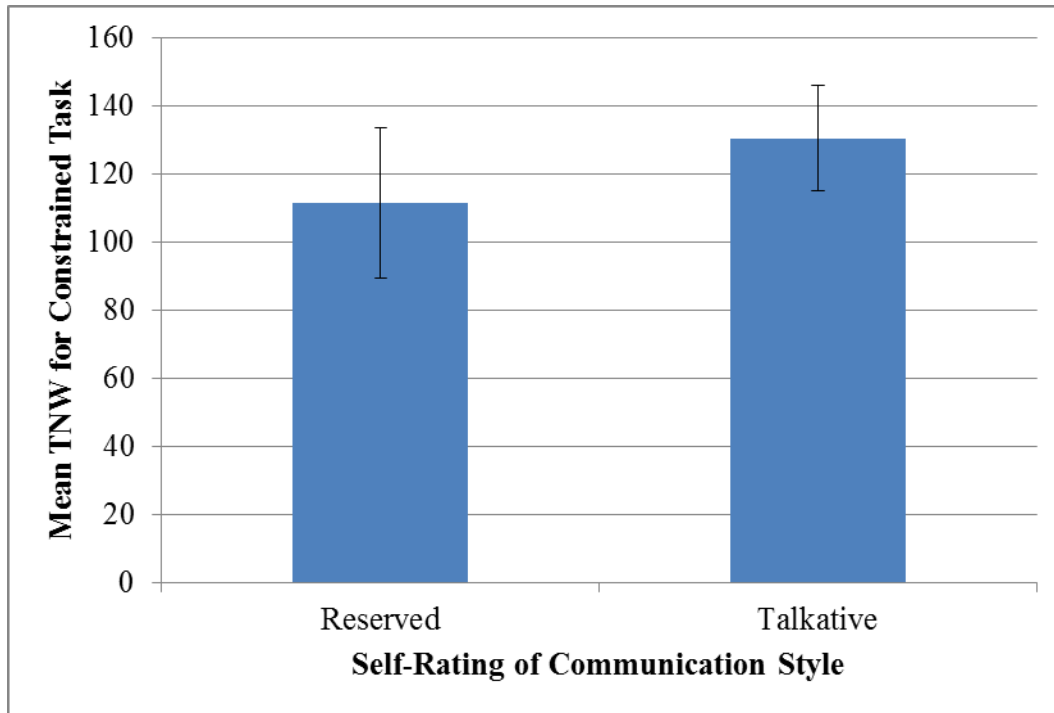
task.

Figure 12.

Mean TNW by self-rating of communication style for older group for constrained task.
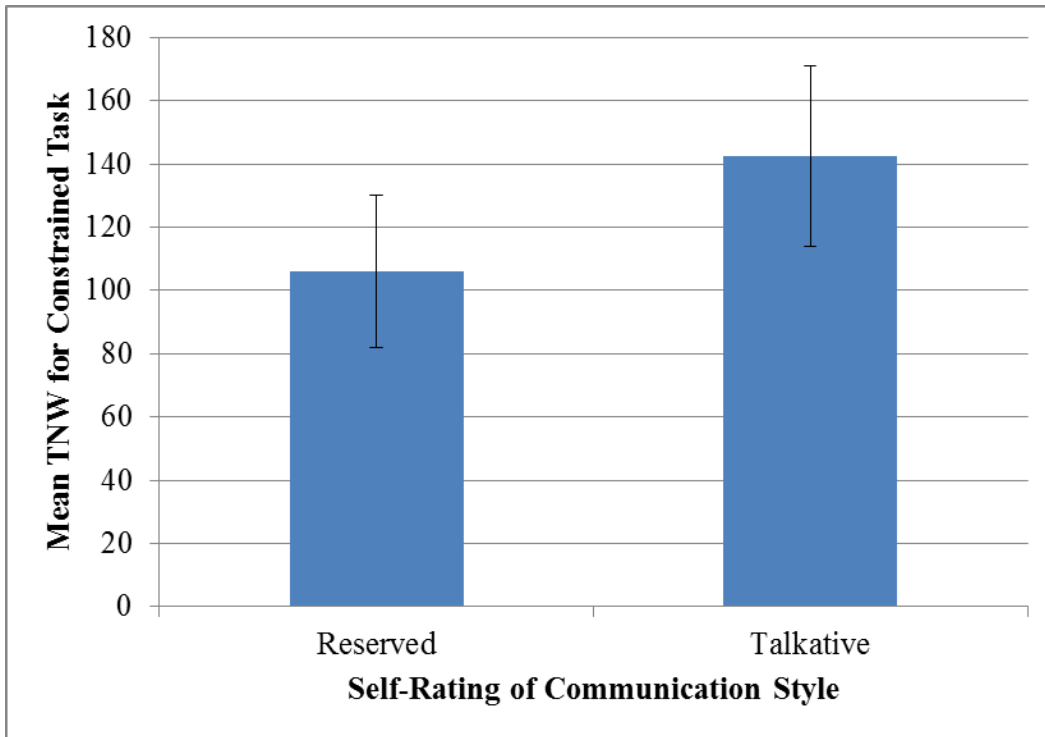
Figure 13.

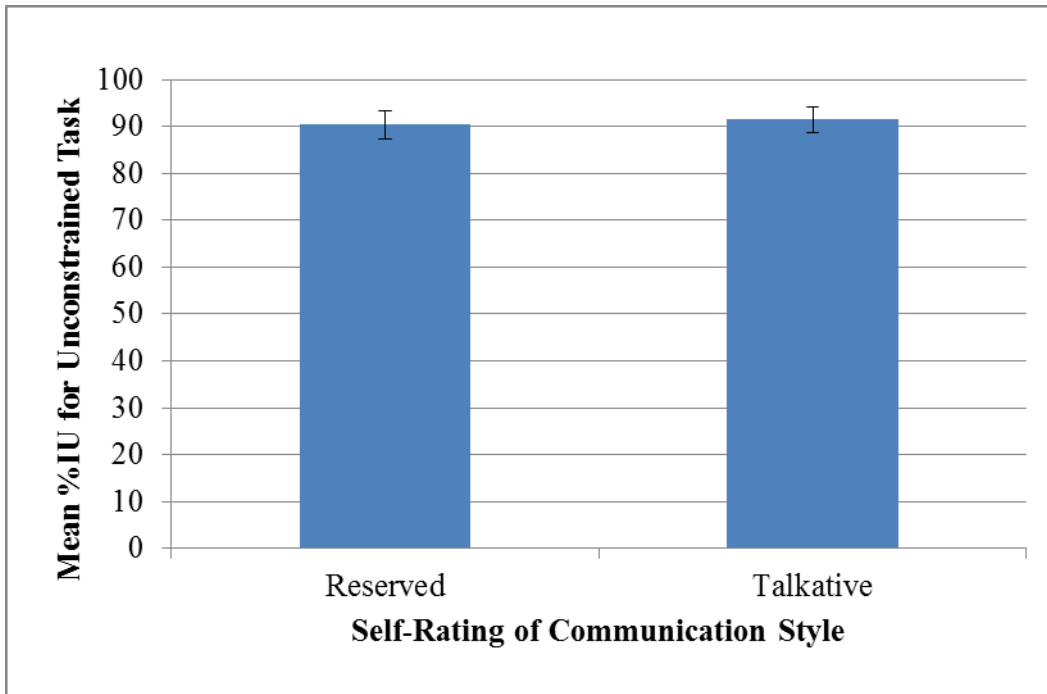Mean %IU by self-rating of communication style for unconstrained task.

Figure 14.

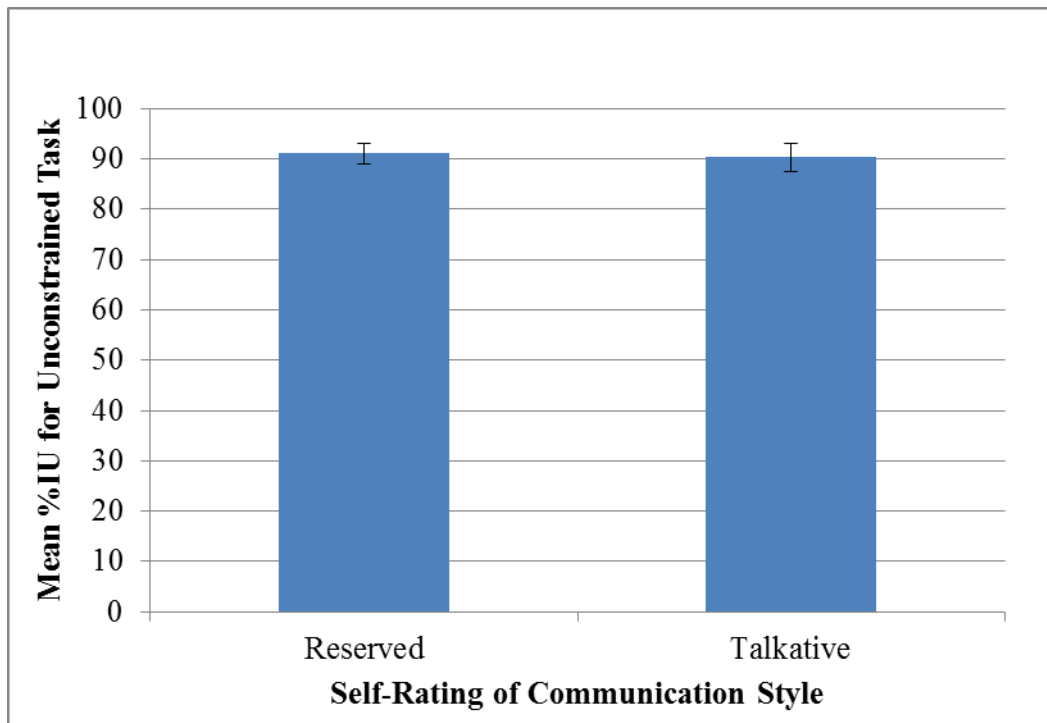Mean %IU by self-rating of communication style for semi-constrained task

Figure 15.

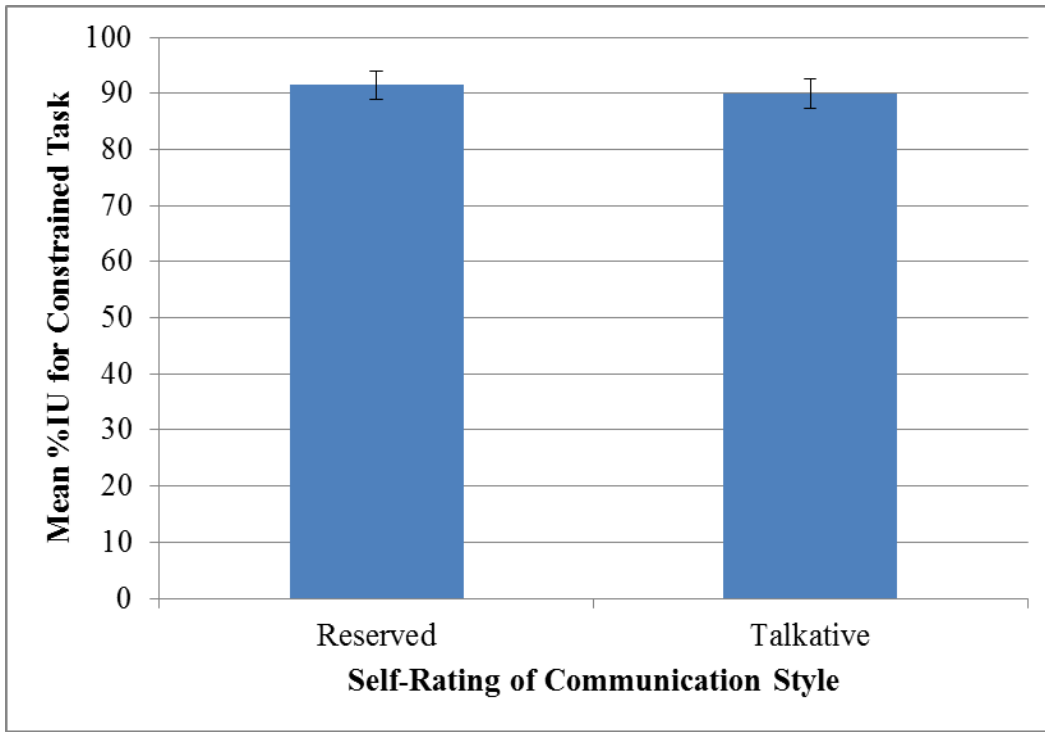Mean %IU by self-rating of communication style for constrained task

Figure 16.

Mean %IU by self-rating of communication style for young group for unconstrained task.

Figure 17.

Mean %IU by self-rating of communication style for middle aged group for unconstrained task.

Figure 18.

Mean %IU by self-rating of communication style for older group for unconstrained task.

Figure 19.

Mean %IU by self-rating of communication style for young group for semi-constrained task.

Figure 20.

Mean %IU by self-rating of communication style for middle aged group for semi-constrained task.
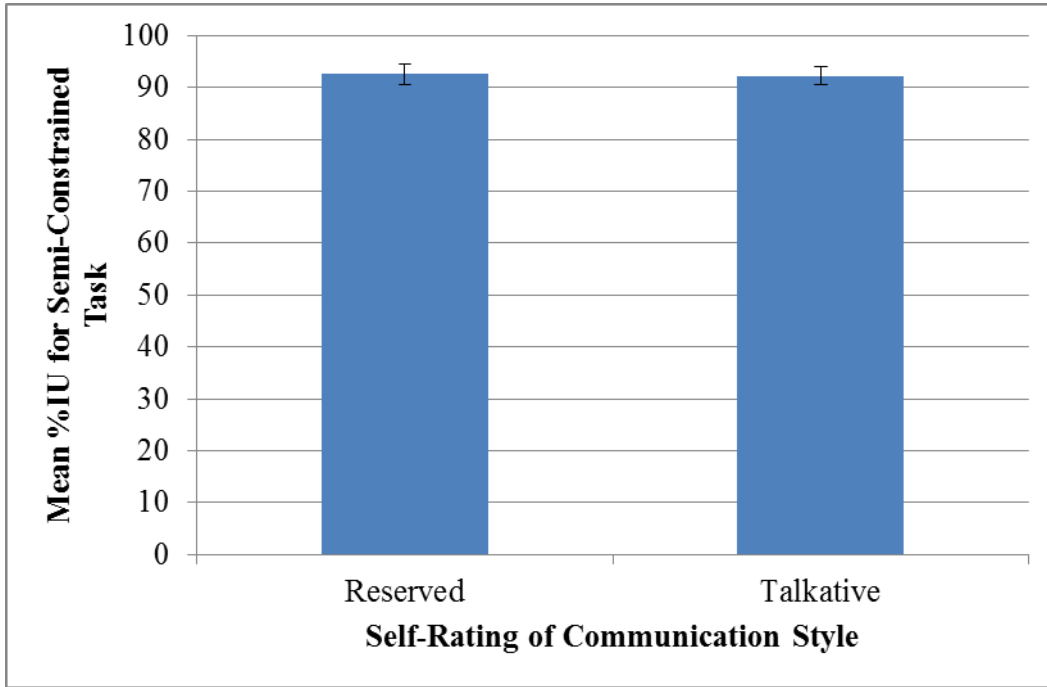
Figure 21.

Mean %IU by self-rating of communication style for older group for semi-constrained task.

Figure 22.

Mean %IU by self-rating of communication style for young group for constrained task.
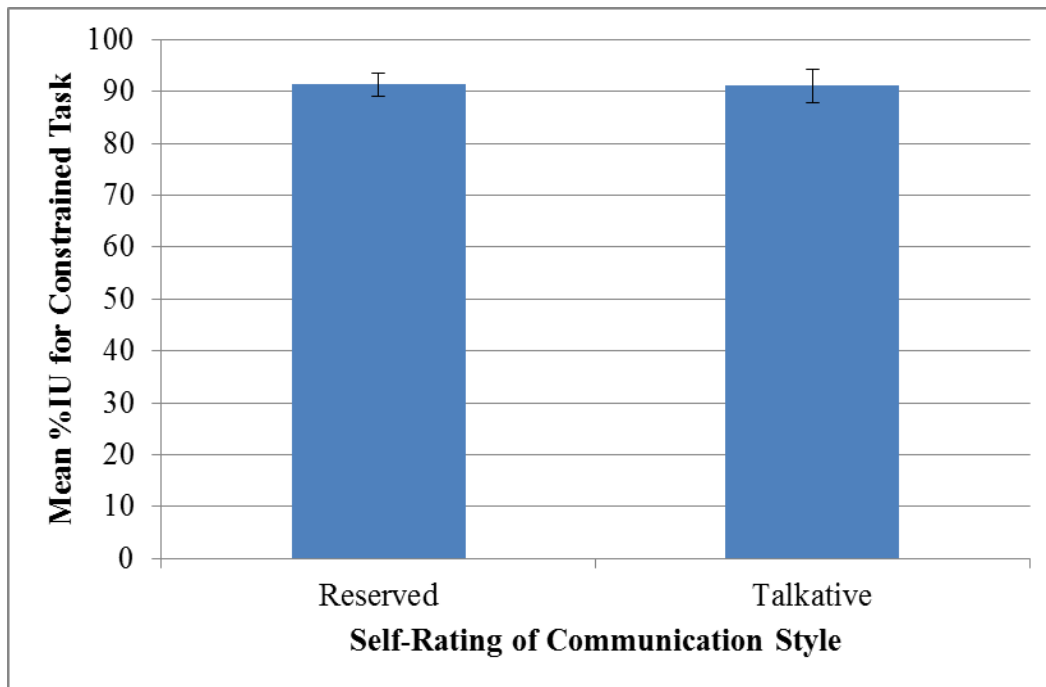
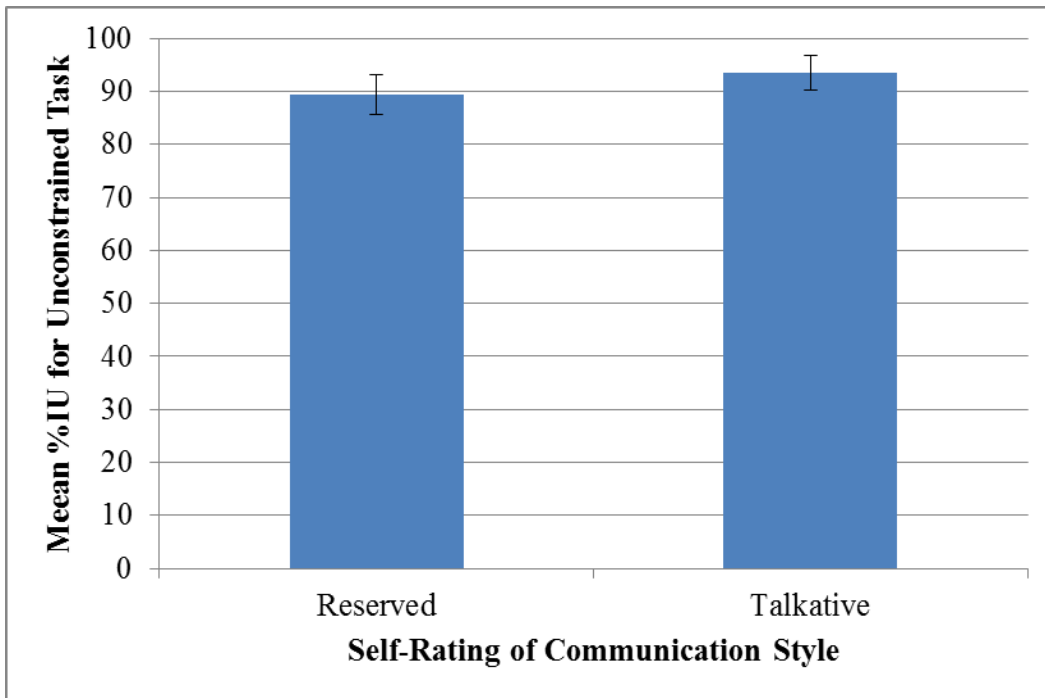Figure 23.

Mean %IU by self-rating of communication style for middle aged group for constrained task.

Figure 24.

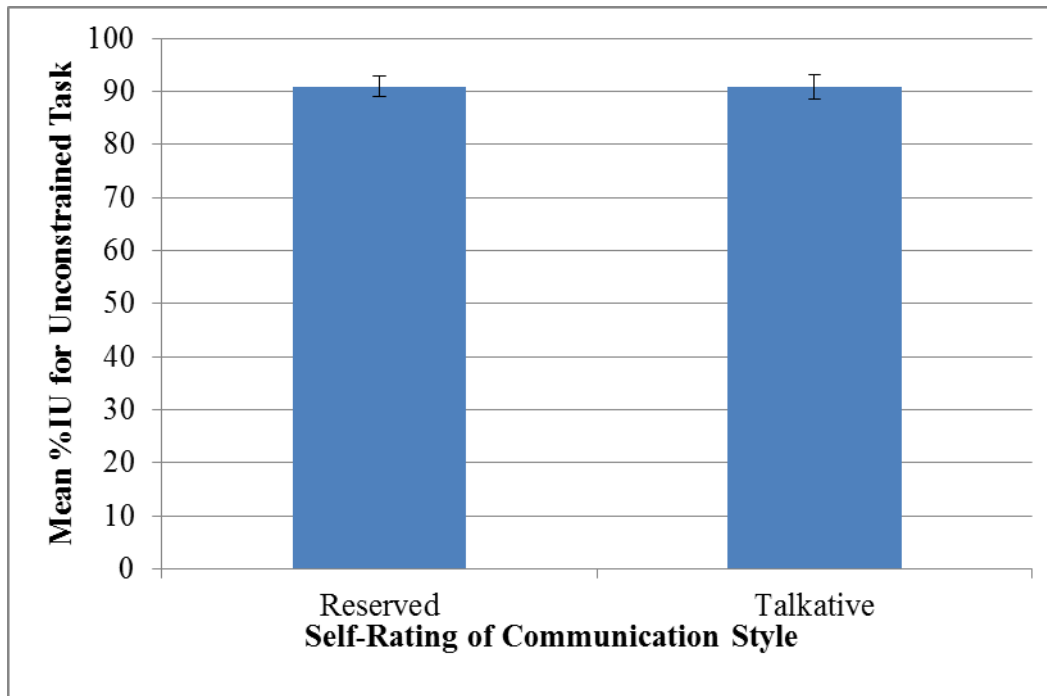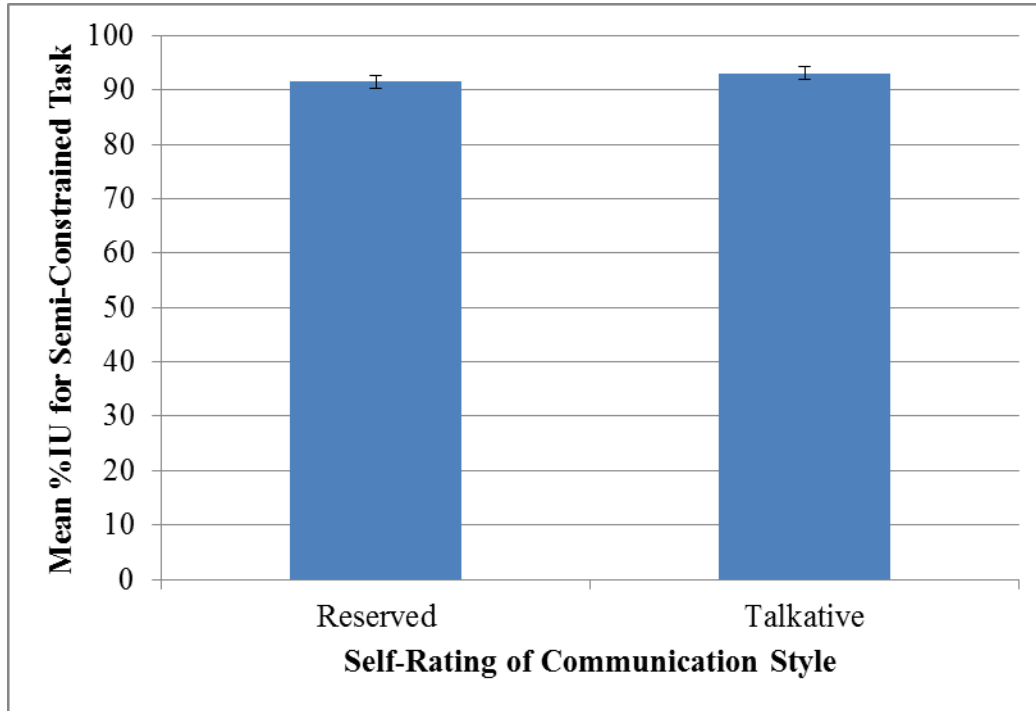Mean %IU by self-rating of communication style for older group for constrained task.

Figure 25.

Mean TNW by age and self-rating of communication style for unconstrained task.

Figure 26.

Mean %IU by age and self-rating of communication style for unconstrained task.
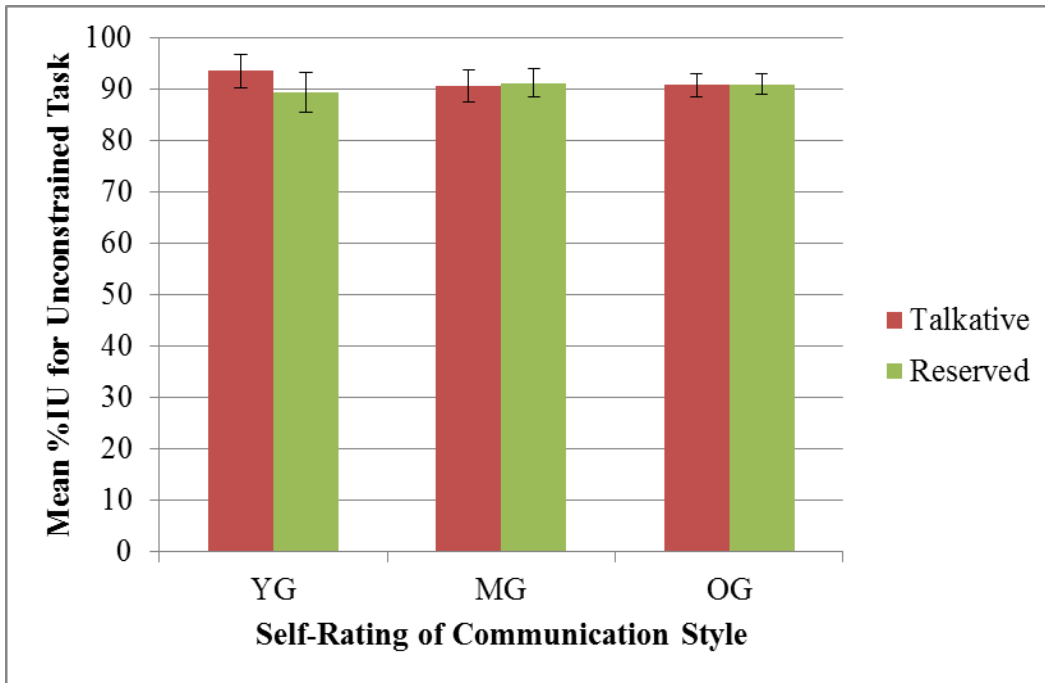
Figure 27.

Mean TNW by age and self-rating of communication style for semi-constrained task.
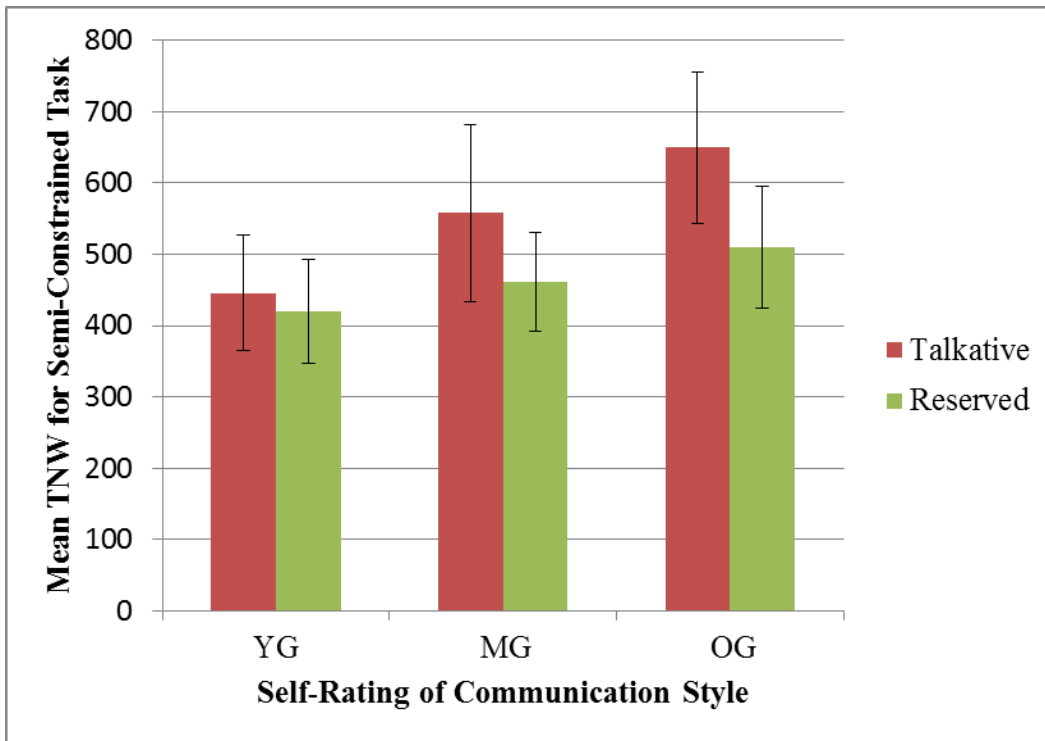
Figure 28.

Mean %IU by age and self-rating of communication style for semi-constrained task.
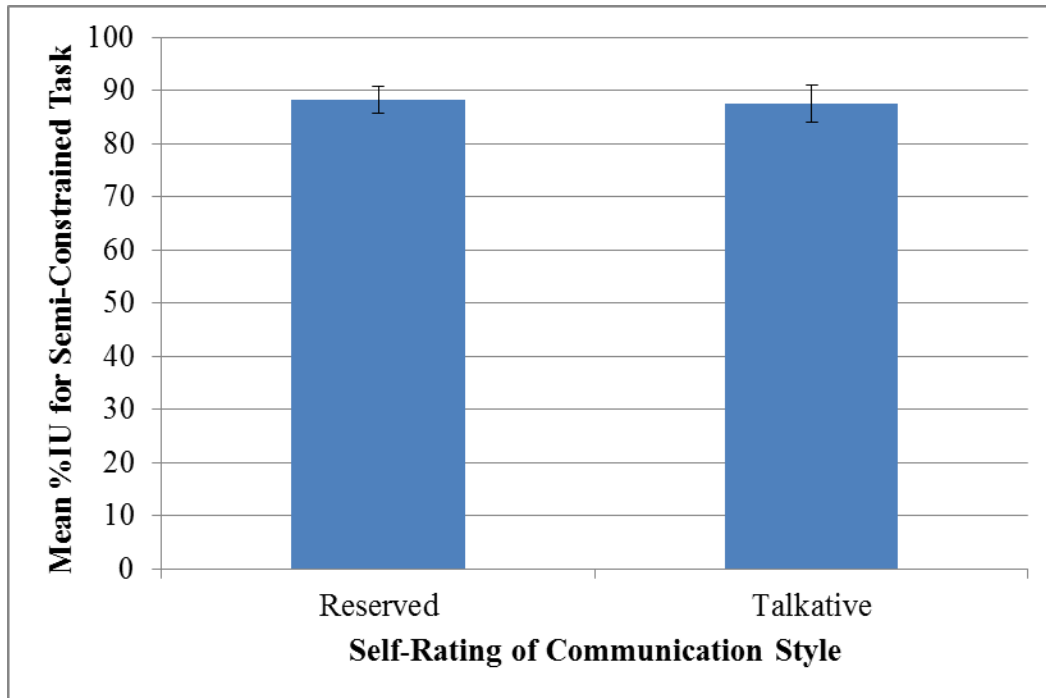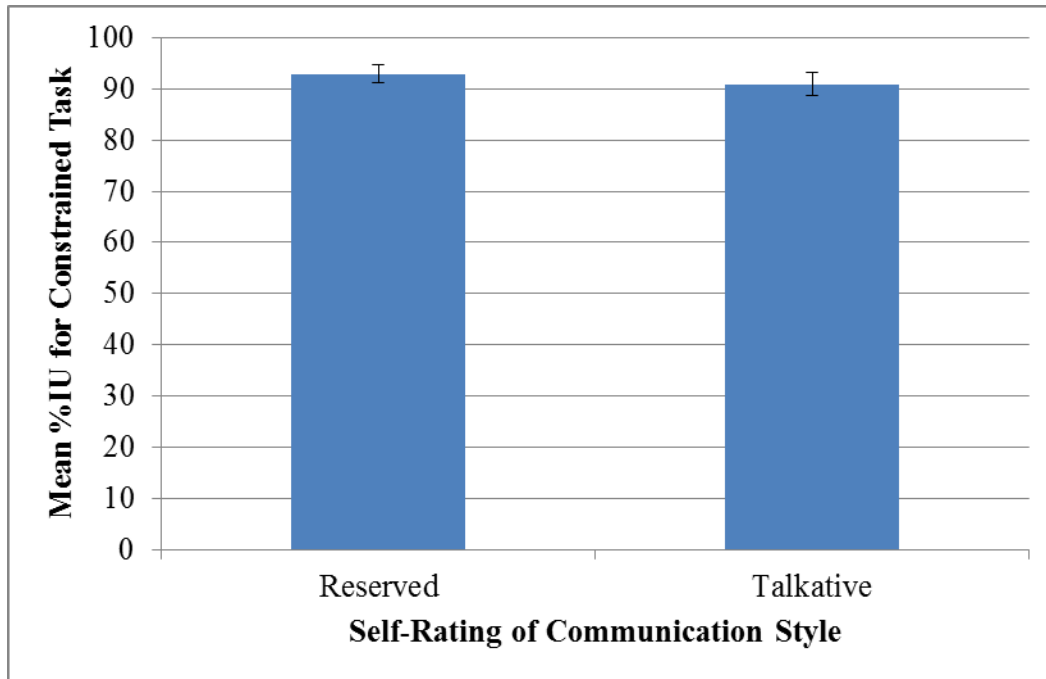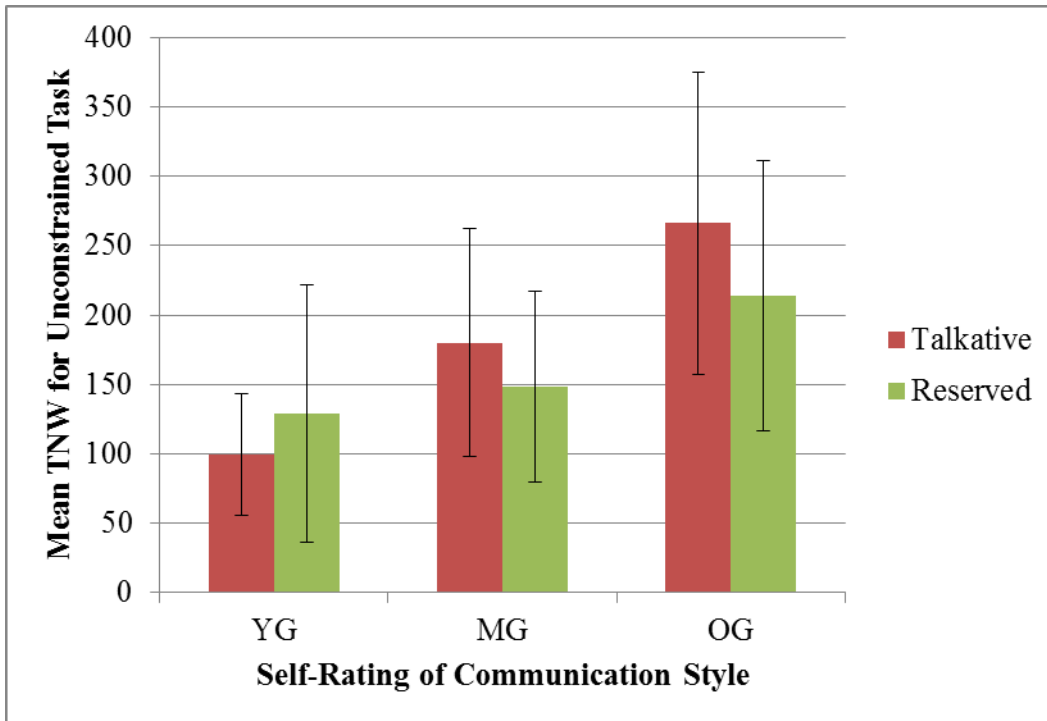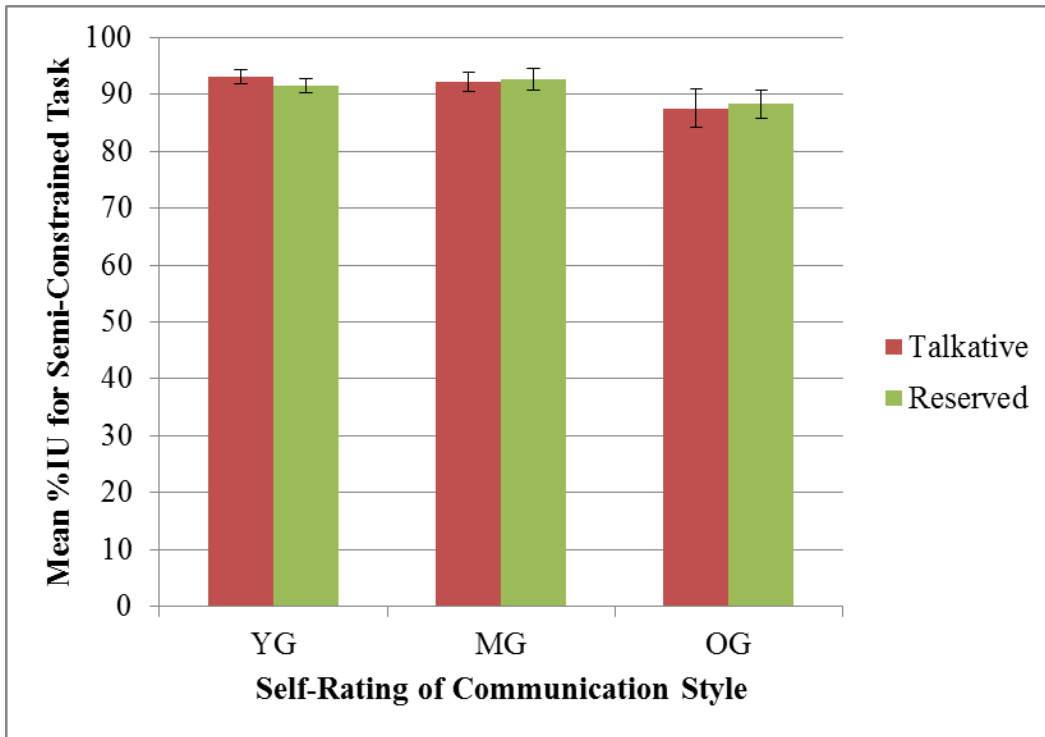
Figure 29.

Mean TNW by age and self-rating of communication style for constrained task.
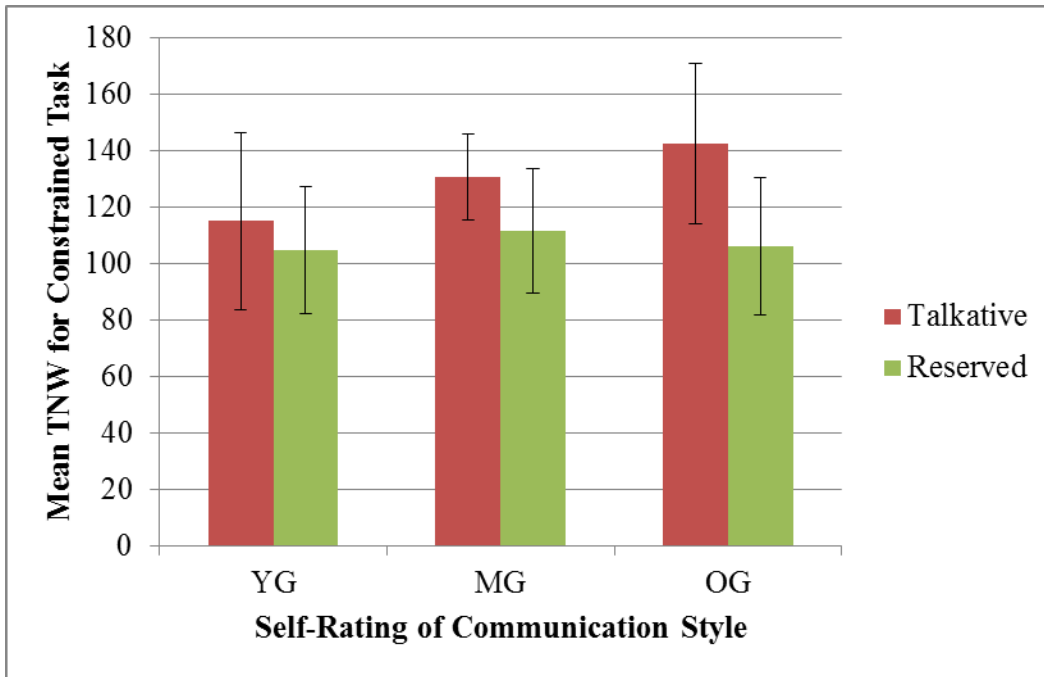
Figure 30.

Mean %IU by age and self-rating of communication style for constrained task.
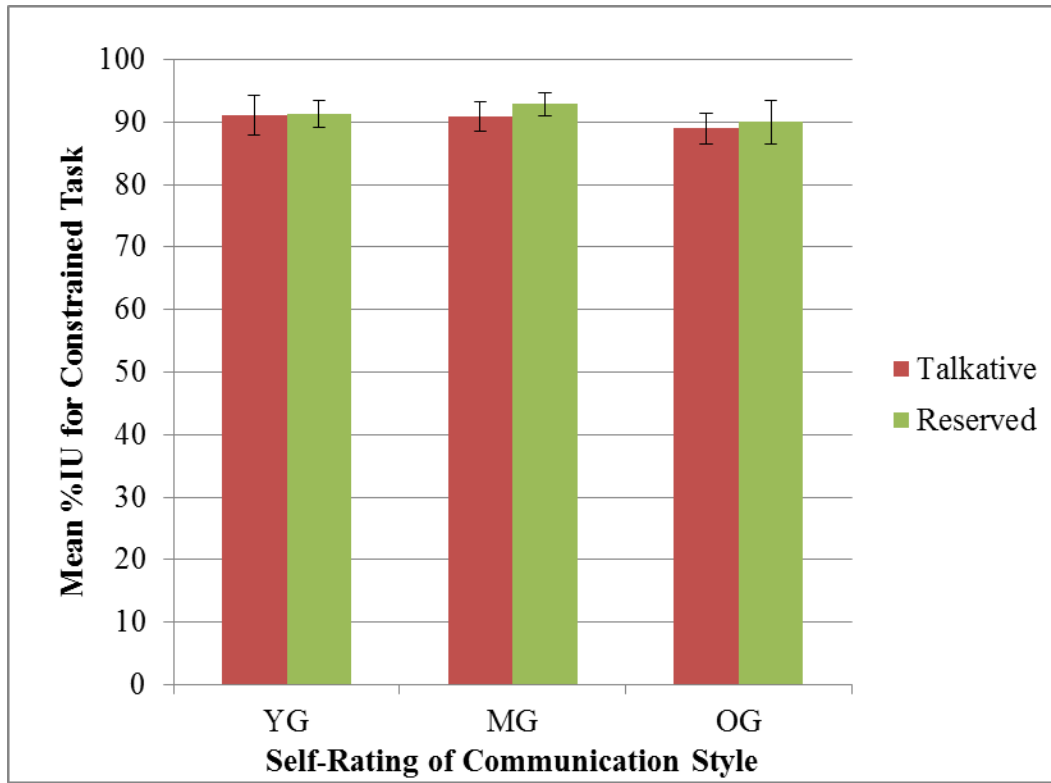
Appendix A.

Argument (Nicholas & Brookshire, 1993).
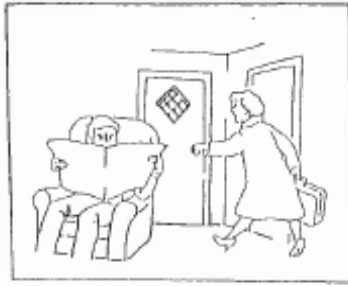
Appendix B.

Cookie Theft (Goodglass & Kaplan, 1983).
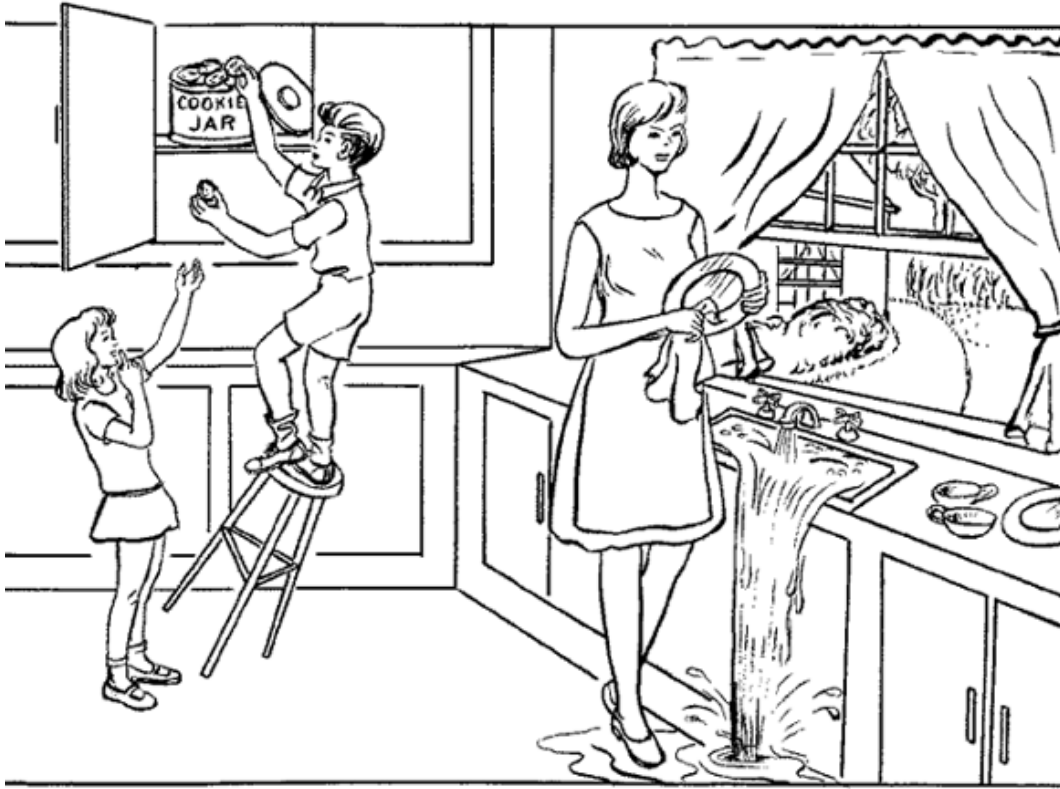
Appendix C.

Story structure for Picnic (McCully, 1984). Taken from Wright et al. (2011).

Family of mice head off in their truck

↓

Truck hits a bump in the road, baby mouse falls out, no one notices

↓

Truck continues down the road

Baby mouse is all alone & sad		Mice arrive at the park, begin setting up for a picnic
↓		↓
Baby mouse holds stuffed animal		Mice play games & music
↓		↓
Baby mouse sees some berries/flowers		Mice eat, swim, take pictures
↓		↓
Baby mouse picks berries/flowers		Mice realize baby mouse is missing, start looking for him
↓		↓
Baby mouse lies in the grass		Mice are sad
↓		↓
Baby mouse walks around		Mice head to the truck
		↓
		Mice in truck drive down the road

↓

Baby mouse runs out in the road, sees the truck, sees mice & they reunite

↓

Baby mouse misses his stuffed animal

↓

Baby mouse goes back into the grass and finds his stuffed animal

↓

The mice family reunite and have the picnic on the side of the road

Appendix D.

Script for Story Task Example.

"These are children's books without words- so that a person can make up their own story. First I will look through the book and get an idea of the story. Then, I will start at the beginning and tell you the story that goes with the pictures"
The examiner read the following scripted story with each new line indicating a page turn:
"A ship captain and his first mate have cited something in the water. A father and daughter are also on board the ship.
The crew along with the father and little girl left the ship in a small boat and traveled to an island they spotted. Now they are on foot and have a great deal of camera equipment with them. They come across a group of natives watching a turtle race.
The captain taps one of the natives on the shoulder and asks a question. The native points to the top of a mountain. The crew begins to climb the mountain. They climb and climb until the captain calls out to them as he points to something in the distance. He is pointing to a great ape swinging on a swing that is held up by a huge tree between two mountains. The crew begins to climb the mountain looking at the ape and the ape looks back in time to see the little girl fall- the ape catches her. He smiles at her and puts her on top of his head-And starts to swing some more. The crew opens a chest they have been carrying and put out a pump and something else- Oh, it is a giant banana. They blow it up. The ape reaches for it.
The crew starts to run down the mountain with the banana hoping the ape will follow them-
And he does. He follows them into the water as they head back to their ship.
Once they get to the ship- the ape gets the banana and turns to look at it- when he does he accidentally sits on the ship and the little girl falls off his head into a ship mate's arms.
The ape continues back to shore pleased with his banana. He stops about half way back and feels the top of his head. He realized that the little girl is gone and he is sad.
The little girl is on the deck of the ship- waving goodbye to the ape and crying.
The ship enters New York Harbor.
The father takes a picture of the little girl with the Empire State Building in the background.
Meanwhile, the ape is in the mountains looking very sad.
A plane flies over his head and drops something out- he catches it.
It is the picture of the little girl! The ape is very happy and hugs the picture.
The End."

Appendix E.

Communication Style Checklist (Capilouto & Wright, unpublished).

Self-Assessment of Communication Style **SCORE SHEET**

1.   My family and friends would describe me as someone who can 'talk to anybody about anything'.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

2.   I tend to be more comfortable speaking in a small group rather than one-on-one.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

3.   I use my hands, facial expressions and/or body language when I talk.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

4.   I do not consider myself to be shy but 'chatty' when I meet new people or interact with acquaintances.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

5.   When asked my opinion, I respond quickly.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

6.   After someone has asked me a question, I realize I have gone on and on for some time!

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

7.   I like to use 10 words even when 2 will do!

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

Appendix E (continued).

8.   I love to argue.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

9.   I say what I think.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

10.   My preferred form of communication is:

face to face   phone   email   texting

11.   When completing the language tasks it was important to me that I connected with the "audience".

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

12.   When completing the language tasks it was important to me that I stayed on topic and that my stories were well organized.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

13.   When completing the language tasks it was important to me that my stories were interesting.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

14.   My performance today was a true estimate of my story-telling skills.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

Appendix F.

Self-Rating of Communication Style Checklist.

1. I would consider myself to be a talkative person.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

2. I am a quiet person.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

3. I like to tell people about events in my life.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

4. I enjoy talking about my interests with people.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

5. I enjoy carrying on conversations with people.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

6. I would prefer to be around people.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

7. What I say is informative.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

Appendix F (continued).

8. When asked a question, I give a detailed answer.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

9. I can answer questions in a concise and to the point manner.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

10. My answers to questions are relevant.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

11. The more that I talk, the more detail I am sharing.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

12. I think before I speak.

1	2	3	4	5
None of the time	Some of the time	Half of the time	Most of the time	All of the time

Vita

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College of Health Sciences Academic Excellence Scholarship Recipient, 2011
Preparing Related Services Personnel for Rural Employment Grant Recipient, 2012