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UNIVERSITY OF CALIFORNIA, SAN DIEGO

Talkativeness as a Component of Effective Communication & Impression
Management

A dissertation submitted in partial satisfaction of the requirements for the degree
Doctor of Philosophy

in

Psychology

by

Margarette Pamela Burd

Committee in charge:

Professor Nicholas Christenfeld, Chair
Professor Victor Ferreira
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2013

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Chair

University of California, San Diego

2013

DEDICATION

This dissertation is dedicated to all the colleagues, friends and loved ones who supported me (and put up with me) during this process without ever giving up on me. This document would not exist without them.

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Burd, M., Contreras, R., Steiner, T., & Ben-Zeev, T. (2004). Arousal and Stereotype Threat. Poster presented at the Stanford Undergraduate Conference, Palo Alto, CA.

ABSTRACT OF THE DISSERTATION

Talkativeness as a Component of Effective Communication & Impression

Management

by

Margarette Pamela Burd

Doctor of Philosophy in Psychology

University of California, San Diego, 2013

Professor Nicholas Christenfeld, Chair

This dissertation investigated the connection between verbosity and individuals' ability to communicate effectively, and to manage the impression that they leave on others. We explored also whether impressions of "talkativeness" were closely linked to the number of words produced by talkers.

Experiments 1a - 1d explored how verbosity changed when subjects were asked to either convey information accurately (control condition), accurately and intelligently (intelligence condition), accurately and amiably (friendly condition), or accurately and efficiently (efficient condition). Experiment 1e took it to the next step, and explored the relationship between verbosity and listeners' understanding. We used the recorded vocalizations from 1a - 1d to present to new subject listeners, who were blind to the talkers' conditions. These subjects followed the talkers' instructions in an attempt to arrive at the correct answer to a problem, and rated the talkers' personalities.

We found that people do alter how much they talk according to some situational cues, like interpersonal motivations. Further, it was shown that when

listeners got the correct answer, talkers had used more words and talked longer; and when talkers had made a positive impression on listeners in terms of efficiency, intelligence, friendliness, and skill, they had used more words and spoken more rapidly.

Experiment 2a asked dyads to interact in real time in two talking situations: A loose, question and answer session followed by a structured, task-oriented session. Subjects rated each other on a range of personal qualities (e.g. friendliness and listening skill) and how much they would like to work with their partner again. The number of words talkers used was significantly correlated between the two talking sessions, and was also correlated with ratings of subjects' talkativeness; it was negatively correlated with ratings of talkers' listening skills and with partners' ratings of desire to work with the talker again. This study found no difference between men and women in verbosity for any part of the study, though it did find that same-sex female pairs rated each other the most harshly.

A final, online component (experiment 2b) presented written transcriptions of the previous study subjects' answers to the get-to-know-you questions to new, naive subjects. Subjects were asked to rate the answers in terms of several personal qualities. We confirmed that reading rather than hearing more words also captured the quality of a talker's "talkativeness", and that using more words was related to others' increased ratings of talkers' creativity, interestingness, and friendliness, though perhaps at the expense of their apparent efficiency.

BACKGROUND AND INTRODUCTION

Talkativeness as a Component of Effective Communication & Impression

Management

Why Focus on Verbosity in Oral Communication?

Although communication can take many important forms such as writing, nonverbal gesturing, and physical posturing, oral communication is arguably one of the most vital components of this process for most human populations. The sheer amount that a person talks during an interaction is readily apparent to observers, and individuals' customary verbosity can range from the extremely reticent talkers on one end of the spectrum to the excessively gregarious ones on the other extreme, with all levels populated in between. Therefore, examining people's levels of talkativeness could be a viable avenue for researching how people form impressions about new individuals, and how talkativeness might impact individuals' communication efficacy.

Indeed, when one casually observes common people's interest in how volubility relates to a person's character and intelligence, one finds that there is a great deal of speculation and advice about it. To illustrate this, one may explore the many adages that exist for laypersons' "education" in how a person's talkativeness denotes his or her nature. For example, Matthew Prior, an English poet and diplomat, said that, "[t]hey never taste who always drink; they always talk who never think." The widely accepted wisdom behind this quote seems to be that it is detrimental for one to talk a great deal, because it indicates to others that one lacks intellect or ideas and is trying to hide these deficits behind a wall of words. Another perspective was offered

by the American theatre critic, John Lahr, who observed that talking too little may be equally problematic when he said, “[a]ccustomed to the veneer of noise ... society is suspicious of those who value silence.” So, this suggests that one's reticence to talk is a cause for others to distrust and to doubt the value of that person, since they may be hiding something or simply lacking anything useful to say. Other admonitions about verbosity, such as “[w]isdom is the reward for a lifetime of listening ... when you'd have preferred to talk”, which is attributed to D. J. Kaufman, allege that decreased wisdom due to an inability to take in new information while talking is the inescapable penalty for increased talking. Clearly verbosity is observed by society at large and used by people to evaluate each other, but the sum of these "common sense" dictums is, at best, a mixed message: On the one hand, talking "too much" is a bad thing because it precludes wisdom and thought, but on the other hand, not talking "enough" makes one appear dull and perhaps even of questionable character. It is an empirical question what the "correct" level of verbosity is when trying to make a positive impression and communicate ideas with accuracy, and whether it is advisable for a person to err on the side of volubility or of reserve in novel situations when these are the goals.

Researcher Susie Scott has published work extensively examining shyness, which is often characterized by individuals' reticence to speak or perform other behaviors in social settings that would make them stand out in the group (2004a, 2004b, 2006). She argues that the perception in Western cultures that quiet people are somehow "abnormal" and perhaps need to be treated for this "affliction," causes shy

people to engage even more in behaviors that perpetuate their marginalization in social settings: For example, shy people tend to contribute less in groups, and this makes them seem aloof and alienating to others. Her perspective suggests that "being shy" is less of a stable, personality trait and more of an ascribed role that people who are less naturally extraverted play. Her work suggests that people who are inclined to be introverted and taciturn can learn to be more gregarious through behavioral practice, and that the "disease" of shyness is not necessarily a problem except insofar as how others in our Western culture view one who is shy. Her work focuses on the idea that society's negative beliefs about shy people must be challenged; however, it also points to the possibility that a person who speaks very little might learn how to talk more than seems "natural" for her, and that this may improve the way that she is viewed in group situations such that she no longer appears to be standoffish and unapproachable. The work for this dissertation aimed to increase understanding of exactly what impressions the amount that a person talks leaves on others, including whether talking more really does go along with leaving a positive impression.

The research literature in this area reveals that some aspects of how oral communication affects a person's impression on others have been studied, such as a person's oration style, level of vocabulary recognized and produced, and capacity for conversational turn-taking. One study in this vein showed that physicians' success with attaining high patient satisfaction and compliance is predicated heavily on the doctors' oral communication style, rather than on their years of experience or the length of their relationship with the patients, as intuition might suspect (e.g. Christen,

Alder & Bitzer, 2008; Tamblin, et al, 2007). Oral communication production is also a vital component of diagnosing cognitive pathology in early childhood development, as well as in adults [i.e. late talking children often prove to have developmental issues such as Autism Spectrum Disorder or other cognitive disorders (Buckley, 2003), while early onset of dementia of the Alzheimer type presents primarily with communicative degeneration (e.g., Bayles, Tomoeda & Trösset, 1992; Orange, 1991)]. Significantly, up to one-half of a person's intellectual potential and development is assessed using the verbal components of important diagnostic instruments such as the SAT, GRE, Wechsler Adult Intelligence Scale (WAIS), and the Wechsler Intelligence Scale for Children (WISC). People's level of talkativeness is also often used as a factor in classifying their personality characteristics by psychologists. For example, the personality trait of "extraversion" is (in part) identified when individuals, or the individuals' close acquaintances, claim that they readily engage in conversations that exhibit high levels of verbosity, even with unknown strangers; while people's "introversion" is established via self- or others'- reports of one's reticence to talk in these same situations (e.g. Hampson, John & Goldberg, 1986; Levesque & Kenny, 1993; Thorne, 1987).

It is not unreasonable to think being highly talkative might impact how much one is esteemed among peers, since it is such a salient and fundamental component of interpersonal interactions. One study that asked strangers to interact in small groups over a series of four weeks and rate each other, found that people's evaluations of their peers' likeability and leadership potential, indeed, is positively correlated with their

ratings of their peers' talkativeness (Castellaneta & Stang, 1976). An important detail to highlight about this finding, though, was that it was only the subjects' *perception* of how much their peers talked that was significantly and positively correlated with subjects' ratings of the others' likeability and leadership. When the talkers' objective level of talkativeness, as measured by the experimenters' actual tally of the number of utterances talkers produced, was correlated with the subjects' ratings, it did not yield a significant correlation. In summary, when subjects thought that a person talked a lot, regardless of the talker's actual amount of talking, subjects liked the talker more. This leaves the obvious questions of what causes a person to appear to be more talkative to a listener than he or she objectively is, as well as why this perception leads people to like one more?

One area where perceptions of verbosity may not match with objective reality is in societal perceptions of sex differences in talkativeness. The societal stereotype of women is that they are overly talkative, while the stereotype of men is that they do not talk enough. One need look no farther than popular culture, where "scientific" books like *The Female Brain* by Louann Brizendine (2006) claim that men only utter 7,000 words per day, while women produce a staggering 20,000. These numbers, according to fact-checking work by the linguist Mark Liberman (2006), were not based on empirical evidence, but instead were made up or perhaps influenced by a non-scientific, self-help book that the author read. Nevertheless, popular media outlets were quick to accept it at face value and to widely report it as "fact." The general belief in the difference between male and female talkativeness has persisted, but a

recent study (Mehl, Vazire, Ramirez-Esparza, Slatcher & Pennebaker, 2007) that used longitudinal, naturalistic recordings of conversations as data showed that there is actually no reliable difference between how much men and women talk in everyday situations. Therefore, though women are perceived in society as being more talkative, they objectively are not in normal situations. In fact, other research has shown that it is actually men who talk significantly more than women in specific situations like group discussions (e.g. Mulac, 1989).

There is still relatively little research into how talkativeness relates to impression-management and communication, which is surprising as there are many issues that one could address via its analysis. For instance, one could examine whether highly talkative people are better or worse teachers and/or learners. One might also explore how listeners' impressions of talkers' worth and compatibility as friends, lovers, or colleagues may be altered by a talkers' verbosity. Early research in this area did reveal some important findings, but these studies were conducted many decades ago, and have left various questions unanswered. One broad finding from multiple studies has been that the individual who talks the most in a group setting receives higher subjective ratings from his group members in the areas of his leadership skill and his contribution to the group's successful problem-solving (Bass, 1949; and Norfleet, 1948). In exploring specifically how an individual's persuasiveness within a group is affected by his talkativeness, another study showed that the most loquacious group member, as objectively measured by the amount of time each member spent talking in the discussion, was more able than the most

taciturn member to get the rest of the group to accept his solution to an assigned problem (Rieken, 1958). Acceptance was measured in a binary "accepted/rejected" manner. It was also shown by Rieken's work that the talkative member was subsequently correctly identified as the source for this solution more often than was the reticent member. It is important to note for this particular study that the "best" answer to the problem was not the original idea of the talkers, but instead was secretly provided by the experimenters to either the most or the least talkative group member, once they had been ranked to be such; so it was not from the talkers that the answers originated, it was simply the talkers' job to get the group to listen to "their" solution, and accept it as the final solution, without letting the other members know that it was not actually their idea.

These studies also did not examine whether talkative individuals have more fertile minds that spontaneously produce better ideas, or if quiet people have relatively less fertile minds that therefore fail to produce good ideas. For example, in the studies discussed above, when the talkers' contributions were original and spontaneous contributions, they were rated subjectively by their peers, and not on their objective merits. In contrast, if talkers' contributions were objectively measured to be the "best possible idea," the contributions were not original ideas produced by the talkers, but were instead pre-researched contributions that the talkers were coached by the experimenters to say. Therefore, it remains an empirical question whether the ratings of talkative subjects' group mates are reflective of the fact that talkative people are, indeed, providing more leadership and better ideas within the group, or whether the

group mates have instead been incorrectly assigning high value to members that just talked a lot regardless of the objective value of their contribution to the group.

This latter topic was investigated, to some extent, by Hayes and Meltzer (1972). These researchers sought to disentangle the issues of simply speaking more often from all of the possible confounding paralinguistic cues such as tone of voice, speech pattern, volume, and others' support or assent, to see if even without these features raters would view high talkers more positively than low talkers. In a series of studies, they compared subjects' ratings of discussants that were either viewed on video with audio, only heard in audio, or whose speaking was visually represented by a panel of lights that each lit up whenever the associated discussant spoke, with no accompanying audio. The light panel was meant to remove all possible paralinguistic cues so that subjects could only see, via the lights, which person was talking over time and how long each utterance lasted. The result was that all subjects, even those who only viewed lights, tended to rate discussants who talked the most, the most positively, leading the researchers to claim that it really is quantity of speaking, more than any other feature, that engendered these increased ratings. More recently, however, work by Jones and Kelly (2007) contradicted this finding in part. They contended that the manipulation of "quality" in past research was too weak, making quantity of speech the de facto basis for determining talkers' value in group discussions. So, to counteract this weakness, they provided participants with written discussion summaries of dyads that had each discussant's contributions listed with a quality rating already assigned to it, and additionally manipulated the quantity of words (high vs. low), and the quality

of the content (high vs. low). They then compared the resulting possible discussion scenarios to each other (i.e. they looked at what occurs when the quality and quantity of the contribution is either both high or both low (quality = quantity), when the quality is higher than the quantity (quality > quantity) or when the quantity is higher than the quality (quantity > quality)). In the discussions where quality = quantity, discussants had either the same number of contributions or the same star ratings for their contributions, and the other scenarios had either the quality or quantity of one discussant's contribution equal to twice that of the other discussant. This led to the result that quantity did not trump the value of quality in subjects' ratings of the discussants' leadership skill. Yet when these researchers tried to use a more real-world variation of the manipulation that listed the discussion contributions without ratings, requiring the participants to assign their own quality assessments, the quantity of contributions again trumped the quality in the subjects' ratings of the discussants' leadership skill; this occurred despite the fact that the presented contributions had been pilot-tested to show the same levels of difference in quality (i.e. the high-quality points shown had been rated by subjects in previous testing to be two-times stronger than the low-quality points). It appeared to be the case that in the more ecologically-valid scenarios, where subjects had to make subjective quality judgments about each discussants' input, something about the quantity of participation influenced their perceptions more than the quality did. It was our intention to see if this quantity-over-quality bias effect would extend to other interpersonal perceptions like friendliness, intelligence, and communication efficiency.

A final question that will be examined is whether those who speak more are perceived by others as being more or less interesting and creative. Perhaps verbose people have a tendency to bore others with an incessant stream of trivial babble. The idea here being that the talker talks without regard to whether the words or ideas are important for the listener to hear, and rather just rambles because for whatever reason he or she cannot control it. This explanation for voluble people suggests that they will be found dull and tedious to listeners. But perhaps it is instead the case that those that speak more are also those that have more interesting things to say. If one has vast knowledge about a topic to share, or just possesses a lot of novel ideas to impart, it may be that it simply takes more talking to get it all out. In addition, it may be the case that by producing more output, one increases the probability that some of that output will be of very high value and will thereby offset the listener's memory of the less-valuable information that was shared. After all, Thomas Edison famously said that if one wants to have great ideas, one must simply have a great deal of them. This explanation for verbosity would then mean that talkative individuals, on average, seem more creative and/or interesting to others. Of course, this then brings up the question of in which direction the relationship between talkativeness and creativity might flow. The direction could be that good ideas lead to more talk, such that fertile-minded people actually have better ideas to share, and this correctly compels them be more talkative; alternatively it could be the case that it is the increased talking that causes ideas to seem better than they objectively are, so that talkativeness from any individual (fertile mind or not) enhances the apparent value of the ideas in others' perception.

This area was preliminarily investigated by Regula and Julian (1973) when they had a dyad of confederates hold a series of supposedly-unscripted discussions about possible alternate uses for a wire coat hanger, in front of an audience of experimental subjects. The researchers experimentally manipulated what input the confederates provided so that the suggestions were either relatively high or low in creativity (as determined by previous, pilot work). The amount that each confederate talked was also manipulated to be either high or low (in terms of how many suggestions each produced), in a 2 x 2 factorial design. For example, in one condition, one discussion would be between a confederate who offered relatively few, highly creative suggestions, and another confederate who offered relatively more, uncreative suggestions, and the audience would then rate each confederate's perceived creativity and social influence. The results showed that simply talking more (e.g. by providing more suggestions), even when the suggestions were objectively less creative, caused audience subjects to rate talkers as more creative and as more influential in the discussion. It would be interesting to see if the sheer number of words used, versus the number of idea units produced, would lead to the same result of high creativity ratings. Is simply being more orally productive in general enough to lead others to view the talker as having contributed more valuable ideas as well? We also intend to extend the ratings to include other personal qualities like friendliness and intelligence to see if the number of words used will have an effect on these socially significant interpersonal perceptions as well.

To review, the two important and unanswered questions about talkativeness that this dissertation will focus on are: 1) the relationship between an individual's verbosity and how others' perceive him or her; and 2) the relationship between an individual's verbosity and his or her efficacy in imparting knowledge to others. Each of these aspects of communication has been examined via a series of studies described below. The following brief outline of the studies is intended to provide a rough framework for the reader going forward, with methodology that is more detailed to come later.

Individual, Audio-Recording-Based Studies

Background and Significance

There are various circumstances in which one person possesses important knowledge, and must orally direct another person's actions based on this knowledge. In these situations it is important, even vital, that the instructions be understood and performed accurately. For example, the 911 operator may need to instruct a caller in how to begin administering CPR or another first-response medical technique on an injured person prior to other medical professionals' arrival on the scene. In such a circumstance, it is beneficial to have empirical data on how the operator can best convey the life-saving instructions to the caller faithfully and clearly. In a common circumstance, a telephone technical support representative must communicate from a remote location and direct untrained clients to perform highly technical and detailed procedures on malfunctioning equipment. In both these situations, not only is it critical to communicate accurately, but to also do so in the most expedient manner. For either

example it is not immediately obvious how much talking will be most efficacious; it may be that instructions that are succinct could be better attended to and followed, or conversely that instructions that are more verbose might be easier for the caller to understand and therefore enact. The shorter timeframe granted by talking less might leave context information out and could thereby result in the directions not being fully understood; while the longer timeframe offered by talking more may allow the important elements of the instructions to be obfuscated and thereby lead to incorrect actions by the caller. The studies conducted below were meant to illuminate how verbosity factors into effective communication in a similar situation, where one, informed person needed to convey information accurately to an ignorant listener. Our findings could give insight into the relationship that the amount of talking has with the goals of communicating more effectively and making a positive, interpersonal impression; perhaps the results will provide clues about whether a person could come closer to these outcomes by deliberately talking more or less than the average person.

I am not aware of any previous studies that have looked specifically at talkativeness in this way, with the exception of one: Ruscher and Hurley (2000) conducted a study of how the content of the narratives of older adults impacted younger adults' negative stereotyping of the older adults and how this content affected how well the younger adults recalled the older adults' narratives. Central to their experimental design was the manipulation of whether the elderly speaker was on- or off-topic during the narrative, and it was secondary whether the speaker was talkative or not. The main findings of this research were that off-topic talk triggered negative

stereotypes of the elderly more across the board, and talking more was recognized as "talking too much" regardless of on- or off - topic content. In their analyses, they also found that the information from the narratives of the on-topic, verbose speakers was retained better, though it remained unclear what the mechanism behind the increased retention might have been. In effect, young listeners felt that the verbose and on-topic elderly talkers talked too much, and endorsed negative stereotypes about the talkers, but also retained the information the talkers conveyed better than information from talkers that talked (and triggered negative stereotypes) less. Presumably, negative stereotypical beliefs about a talker should cause a listener to value the information being conveyed less, and yet in this study this was not the case. Somehow, the deluge of on-topic information got retained despite the negative stereotypes, and this is an interesting finding that this dissertation intends to try to expand upon.

Current Work

In our work, we aimed to establish whether talkativeness was an important factor in interpersonal perception; whether talkative people exhibited their verbosity even under restricted, highly goal-oriented circumstances; and whether talkativeness helped or hindered clarity of communication for listeners. Individuals' "talkativeness" will be defined as the number of utterances emitted during each task. Though in linguistic terms, an "utterance" may be the entirety of the speech produced during a given time period, for the purposes of this work an utterance was defined as each, discreet, spoken unit within a period of speaking. I.e. each vocal pause like "um" or "ah" was counted as one utterance, as was each spoken word. Therefore, a speech

period that contained five words and three vocal pauses was counted as having eight utterances within it.

For this first set of experiments, we were interested in determining how individuals' idiosyncratic verbosity might impact later listeners' ability to correctly follow the speakers' instructions. Because we did not want subjects' talkativeness to be influenced by others' level of volubility, these first studies were conducted using lone individuals who were asked to perform as either speaker or as a listener for an oral task. The efficacy of communication was measured by documenting a later listener's success or failure in following the talker's recorded instructions to complete each trial accurately. Directly subsequent to each trial, the listeners provided ratings of the most recent talker on a number of personality trait and task-performance questions. We also examined whether subjects' level of talkativeness would systematically change in response to impression-management goals, such that, for instance, "seeming friendly" and "seeming smart" would encourage the use of more words, while "seeming efficient with words" would cause fewer words to be uttered. Additionally, we wanted to see if subjects would be successful in conveying these traits to listeners, and if this success would be related to their chosen level of verbosity.

As we were interested in whether the subjects' talkativeness level in the lab would be consistent with that of their customary interactions outside of the lab, indicating that this might be a stable trait across these two settings, we also asked the subjects to provide the name and number of a close friend or relative whom we could contact and ask some questions.

Our design sacrificed some external validity due to the fact that subjects did not interact with each other in real time and thereby were not given the opportunity to request or provide clarification, but we feel that this was justified in order to isolate verbosity as the independent variable and not confound it with other interpersonal communication strategies. For example, a voluble individual might be more or less responsive to listeners' professed confusion, and this quality of interpersonal communication is separate from our question of how verbosity itself affects communication. Previous research suggests that when speakers know that their words will be conveyed via restricted technology, such as when subjects have to press a button to speak to each other during video mediated communication, they are more careful to speak in a way that is more clear and intelligible to the listener (Sanford, Anderson & Mullin, 2004). This means that being recorded may have caused our subjects to all talk more (or to talk less) than would be typical for this task, which would act to counteract any communication deficits stemming from a lack of back-and-forth communication strategy. The group studies that were conducted later allowed us to examine speakers' audience-responsiveness interactions with talkativeness, and directly address these potential issues of external validity.

In-Vivo, Group-Based Study

Background and Significance

As mentioned previously, in most interpersonal communication there are opportunities for back-and-forth exchanges to request and provide clarifications, elaborations, and reiterations that were not present in the first studies conducted with

lone individuals. To address these types of oral exchange situations, and to thereby increase the external validity of our findings, we included this group task.

Group encounters allowed for more naturalistic interactions, and provided an opportunity to examine how communication strategies evolve over time and over situations. Many studies have revealed that cross-sex communication yields varying effects on talkativeness in people (Asendorf, Denissen & van Aken, 2008; Haas, 1979; Hannah & Murachver, 2007; Leaper & Ayres, 2007; Leaper & Smith, 2004; Littlepage & Mueller, 1997; Myaskovsky, Unikel & Dew, 2005). Therefore we utilized both males and females in same-sex as well as cross-sex pairings in order to see if the groups did, indeed, differ in their dynamics as they related to talkativeness.

Another interpersonal quality that was compelling to investigate was how interesting and creative listeners found talkers to be, and whether this was related to the sheer number of words used by the talkers. There is some suggestion in the literature that increased talking was related to increased creative problem-solving when the subject was alone and the talking was "self-talk" (Goor & Sommerfeld, 1975). Further, subjects who were assessed to be talkative in their native tongue were also rated as having exhibited more verbal creativity while learning foreign languages (Dewaele & Furnham, 1999). These findings suggested to us that perhaps increased talking while answering an interpersonal question would also correlate with increased creativity ratings by others.

Current Work

This study looked at how talkativeness affected communication efficacy for both the role of being a teacher and a learner; influenced interpersonal impression formation (appearing likeable, intelligent, etc.); and whether one's level of talkativeness remained consistent between unstructured and structured communication conditions.

This experimental design utilized in-person, conversational dyads who were paired up randomly. This study was meant to more closely mirror "real world" oral interactions where the subjects took turns assuming the speaker and listener roles. The subjects' unique verbosity and oral communication styles were therefore given the chance to influence each other in real time. In this experiment, there were two stages of measured communication between subjects. The first stage consisted of a fairly unstructured "get to know each other" conversation, wherein the participants asked and answered a set of predefined questions. These questions were written to be open-ended, such that each subject could expand his or her answer as much as he or she deemed appropriate and thereby express his or her personal verbosity in such a social exchange. By providing the opportunity for each subject to choose how much to elaborate his or her answers allowed us to directly explore the possibility that longer or shorter utterances would be found to be more or less interesting by listeners.

The second stage of the experiment was much more structured and goal-oriented in nature, so that we could get a measure of whether individuals' talkativeness remained consistent between these two differing situations. Subjects during this

second stage needed to convey oral instructions to their partners so that their partner could successfully complete a map task. Each subject had unique facts and details that he or she needed to get the partner to understand in order for their joint task to be successful.

Prior to participating, all subjects completed a personality inventory (fully described later) to identify their individual personality types. Next, a post-task quiz was administered, during which further communication between participants was not allowed. Subjects were therefore forced to rely on the knowledge they had already garnered to complete the quiz successfully, which allowed us to assess the quality of the partners' communication. Finally, we asked each subject to rate their partners on a range of personality traits and on their partner's skill at the map task.

We next explored how talkativeness might influence perceptions of the talkers' creativity by utilizing the transcribed responses to the elaborative questions from the get-to-know-you portion of the group task in a follow-up, online study. We used the final three questions posed during this stage of the group study because they were the three "richest" questions, designed to be the most able to evoke elaborate and creative responses. For example, one question the subjects answered was, "If you could have any super powers you wanted, what would you choose and why?"

New, naive subjects were recruited who had not had extended social contact with the talkers who were used as stimuli, enabling us to better control for any possible confounding variables that other aspects of the group study's cooperative interactions might have introduced. For example, if the map task that followed the get-

to-know-you session had proved to be overly frustrating for a dyad, that could have colored partners' memory for, or impressions of, each other's creativity in the initial interaction. By using subjects that had not taken part in the group task, we were able to look more explicitly at how the sheer number of words a talker used influenced subjects' judgments of talkers' response creativity, since participants never saw the talkers or interacted with them. Specifically, many possible confounding factors like physical attractiveness of the speaker, gender effects, vocal quality, and the success or failure on a cooperative task were all eliminated.

Participants in the study were presented with a series of 12 different answers to one of the six possible questions posed. The participant was asked to subjectively rate each answer in regards to how the subject perceived its originator's intelligence, creativity, interestingness, efficiency with words, friendliness, and verbosity.

CHAPTER 1. EXPERIMENTS 1A - 1D

Methods

Participants

Two hundred eighty-two students from the University of California, San Diego participated in one of a series of four experiments through the Department of Psychology in exchange for course credit. Participants consisted of 51 males and 231 females. Fifteen participants (3 males and 12 females) were excluded from analysis due to either a technical error or equipment malfunction, leaving data from 269 participants viable for data analysis. Ages ranged from 18 to 27, with a mean of 20.3 years. The ethnic makeup of participants consisted of 16.8 % White/Caucasian, 11.3 % Hispanic, 65.4% Asian, .7% African American, and 5.8% Other/Unspecified. Measures of ethnicity were based on self-report.

Materials

Audio recordings were collected using a standard USB microphone. Stimuli were presented on a 15-inch monitor using a computer running E-prime software.

Procedure

Experiment 1a:

Upon arriving, each participant completed two consent forms; the first was a general description of what they should expect from participation, while the second granted the experimenter permission to audio-record the session and use the recordings in future experiments, as well as analyze subsequent data. The experimenter next collected the participants' demographic information including sex,

age, and ethnicity. Finally, the experimenter requested the name and telephone number of a friend or family member who knew the participant well to serve as a reference for a follow-up questionnaire. Participants were given a broad explanation of the study as one investigating aspects of communication in group tasks, and told that they would be “playing the role of a describer in a guessing game”. The experimenter delivered scripted, oral instructions, pausing at prescribed points to receive affirmation that the participants understood the procedure. The subjects' task in all four experiments was to orally describe the assigned quadrant for that trial such that “later a guesser [would] be able to correctly identify which quadrant you were describing based on your verbal description alone”. This first iteration of the study served as both an initial, exploratory condition looking at the relationship between verbosity and our target dependent variables, and as the control condition for the final set of four studies in this group; an independent variable was added to the last three experiments as described below.

Computer task

The experiment consisted of 15 trials of a computer task wherein the subject was presented, one at a time, with a random series of 15 out of 30 possible slides on a computer monitor. Each unique slide was numbered in the upper right-hand corner of the screen and was divided into four quadrants, labeled quadrants A through D. In each of the quadrants was a set of four geometric shapes (See Figure 1). The arrangement of shapes within the four quadrants of any one slide was designed to be similar to varying degrees, such that the configuration of shapes in each quadrant

differed slightly in either the type of shapes, colors, sizes, spatial position, or some combination of these dimensions. At the onset of each trial (See Figure 2), the E-Prime program randomly assigned the participant a quadrant to describe by having a letter A - D appear on the monitor. The subject acknowledged the letter by pressing a key on the keyboard, and he or she was then randomly shown one of the possible slides. Participants were given almost total freedom to describe the quadrants on the slide in whatever manner they felt would help the later listener get the correct answer; however, they were explicitly told not to include the letter or the spatial location of the quadrant in their descriptions. We did this to allow for individuals' unique level of verbosity to be able to be expressed, so we could determine whether variations in talkativeness would be found even on this simple task. At the end of each trial description, the participant stated which slide number and quadrant they had described to enable the experimenters to later verify that the correct quadrant had been described by cross-checking the stated quadrant with the quadrant letter recorded by the E-Prime program. In rare cases where the subject forgot which quadrant had been assigned for that trial by the random letter generator, they were told to choose and describe any of the four quadrants they liked, and to state clearly which quadrant they described at the end. Participants were told that they would be given a maximum of two minutes to finish describing each slide, after which time the program would cut off the trial and automatically advance to the next trial. It was extremely rare for anyone to take longer than two minutes for a trial, but it did occur a handful of times, and these truncated recordings were used as they stood during data analyses.

Each participant completed 1-3 trials while the experimenter was present, to ensure that the equipment was functioning properly and that the subject understood and correctly followed the procedure instructions. After these supervised trials, the experimenter moved into the hall, and the subject completed the remaining trials alone. All trials, as well as the instructions, were audio-recorded. Although each participant completed fifteen trials, only the middle trials (six through ten) were used for data analysis to preclude warm-up and fatigue effects from muddying the data. Upon completion of the fifteen trials, each participant was asked to state what they believed was the focus of the research study as a validation measure for the task, as well as to be sure that no participant suspected the true focus of the study. This information was recorded, and the computer task terminated. No one suspected that the study was looking specifically at verbosity according to these descriptions, and all subjects seemed to understand the task. Once the computer task had ended, the participant retrieved the experimenter from the hall.

Debrief.

As the final component of the procedure, the experimenter debriefed the subject on the purpose of the study. In an effort to maintain the integrity of the study, the experimenter then received verbal consent from the participant that he/she would not disclose the purpose or procedure of the study to anyone outside of the lab.

Experiments 1b - 1d:

These Experiments followed almost identical procedures as Experiment 1a, but served as the experimental conditions of this set of four studies, because these latter

three experiments extended the study instructions to include an interpersonal perception goal for the participants. Specifically, subjects were told that as well as making sure that the later guesser could correctly identify the quadrant described, they were also to try to portray one of three personal qualities to the guesser through their instructions. In Experiment 1b, subjects were told to try to seem "smart" to the listener. In Experiment 1c, subjects were told to appear "friendly," and in Experiment 1d, subjects were told to seem "efficient with words."

Results and Discussion: Experiments 1a - 1d

A preliminary analysis identified outlier talkers (i.e. participants who scored above a 2.5 on the SPSS anomaly index, based on their word count during the task), so we trimmed the data from these fifteen outliers (which amounted to 5% of the total subjects). These outliers were evenly distributed across the experiments, and upon closer examination showed no systematic pattern that would indicate an empirically interesting commonality amongst these subjects. All analyses were therefore run after excluding these outliers.

Additionally, word count analyses were run both with and without counting vocal pauses (e.g. "um" and "ah") as utterances, to check to see if counting the vocal pauses as utterances would affect this measure. The two approaches to measuring word count resulted in the same pattern of results, so all further analyses were based on word count that included vocal pauses. This allowed us to more directly compare the effect of how much a person talked (i.e. number of words used, including vocal pauses) with our measure of mean length of utterances (MLU) in seconds, since the

MLU by necessity included vocal pauses, on our dependent variables. We were also able to then combine these measures to get rate of speech (i.e. mean words used per minute) to further explore effects that were not encompassed by the two other measures independently.

Main effects

Personal contact ratings

In an effort to see whether subjects' verbosity in the lab setting correlated with that of their personal attributes in the real world, we ran bivariate, correlational analyses between word count, MLU, and rate of speech with the ratings that we collected by telephone from the subjects' close friend or family member contact. Though the personal contact ratings of talkativeness did not correlate significantly with any of our measures, we did find that the contacts' ratings of subjects' intelligence were significantly correlated with both subjects' word counts and their MLUs ($r = .203$ & $.205$, $ps < .05$, respectively). Additionally, contacts' ratings of subjects' teaching acumen was positively correlated with subjects' MLUs ($r = .208$, $p < .05$). There were no other significant correlations found between the personal contact ratings of the subjects and their vocal behavior in the lab setting.

Motivation analyses

We ran one-way ANOVAs comparing the no motivation condition to the three experimental conditions to see if having an interpersonal impression-management motive affected volubility for each of our three measures.

In looking at word count, there was a main effect of condition ($F(3, 263) = 2.98$, $p < .05$; see Table 1), and the pairwise comparisons revealed that this was driven by the Efficient condition ($M = 53.19$, $sd = 29.21$) having used significantly fewer words than both the No Motivation and Smart conditions ($M = 70.27$, $se = 5.28$, $p < .01$; and $M = 66.91$, $se = 4.53$, $p < .05$, respectively), and marginally fewer than the Friendly condition ($M = 62.82$, $se = 3.63$, $p = .07$). This indicates that telling people to try to seem efficient with words had the effect of causing them to use fewer words, though the other two interpersonal motivation conditions did not have this effect. Having any interpersonal motivation at all caused all the subjects in the three experimental conditions to use fewer vocal pauses, but not fewer utterances overall, so they used more content words than the subjects in the No Motivation condition, according to an ANOVA and planned contrast ($F(3, 263) = 9.70$, $p < .001$; $t(263) = 5.00$, $p < .001$), as shown in Figure 3 below. This suggests that when given an interpersonal motivation like "seem smart," "seem efficient," or "seem friendly," people tended to use fewer vocal pauses and more content words than when they were not given this additional goal.

Turning to MLU (as measured by average clip duration for each talker over his or her fifteen trials), there was no main effect of condition ($F(3, 250) = 1.71$, $p = .17$), though there was an interesting condition by sex interaction that will be discussed shortly.

Finally, the rate (as measured by words per minute (wpm)) at which subjects talked was marginally different between conditions ($F(3, 250) = 2.31$, $p = .08$). Closer

examination of the pairwise comparisons showed that this effect was due to the Efficient condition having evoked slower speech rates ($M = 86.91$ wpm, $sd = 21.46$) than either the No Motivation ($M = 96.97$ wpm, $sd = 17.82$, $p < .05$) or Friendly ($M = 94.46$ wpm, $sd = 23.93$, $p < .05$) conditions. Though the Smart condition ($M = 92.60$, $sd = 24.86$, n.s.) did not differ from any other condition in speech rate. Again, something about the instruction to "seem efficient with words" causes subjects to not only use fewer words, but also to say those few words more slowly.

Sex analyses

Men ($M = 45.87$, $sd = 16.50$) used marginally more words than women ($M = 65.98$, $sd = 38.27$; $p = .55$) and spoke significantly longer ($M = 41.82$, $sd = 19.22$ & $M = 39.99$, $sd = 17.88$, respectively; $p = .5$), but did not differ in speech rate during this study (See Table 2). So, men were more talkative than women on average, but there was again an interaction with sex and condition that proved to be interesting.

Interactions

As mentioned above, there was an interesting interaction between condition and sex (See Figure 4) wherein men and women adjusted their talkativeness differently in response to the Friendly condition: Women ($M = 65.98$, $sd = 38.27$) used marginally more words than men ($M = 45.87$, $sd = 16.50$; $F(1, 87) = 33.71$, $p = .06$), and women ($M = 42.17$, $sd = 18.98$) had significantly longer MLUs than men ($M = 31.64$, $sd = 7.79$; $F(1, 76) = 4.13$, $p = .05$). This was also the one condition that exhibited women speaking more, on average, than the men did.

Discussion

The findings from this set of talking experiments suggest that people do alter how much they talk, and the content of what they say according to some situational cues. Subjects that were given the additional, interpersonal goal of seeming either friendly, smart, or efficient with words were more likely to use content words than vocal pauses in their speech than those that were only instructed to convey information accurately. People who had the goal of seeming efficient with words additionally altered their speech by also using fewer words overall, and speaking those words more slowly. It also appears that how much a person talks with friends and family outside the lab may not be consistent with how much he or she talks in the lab setting, which is not surprising since many findings show that cross-situational consistency of most social behaviors is generally low (cf. Mischel, 1984).

Communication is, by definition, at least a two way process, and it is important to understand not only how a talker presents himself to others, but also how the communication choices the talker makes affects the recipients' ability to understand and respond to the communication. Because we had gathered this new information that situational differences and interpersonal goals had affected talkers' vocal output, we next needed to look at whether the ways that the talkers changed their talking behavior translated into differences in the communication outcomes with the intended listeners. We focused, therefore, on whether listeners had differential success at following talkers' directions, and whether the listeners' impressions of the talkers varied in the ways the talkers aimed for.

CHAPTER 2. EXPERIMENT 1E

Methods

Participants

Eighty-three students from the University of California, San Diego participated in this experiment in exchange for course credit. Participants consisted of sixteen males and sixty-seven females. Ages ranged from 18 to 25, with a mean age of 20. The ethnic makeup of participants consisted of 24.1 % White/Caucasian, 9.6% Hispanic, 57.8% Asian, and 8.5% Other/ Unspecified. Measures of ethnicity were based on self-report.

Materials

The audio recordings that were collected from the previous four studies were used as stimuli used for this study, and presented via a computer running E-prime software. Accompanying visual stimuli were presented on a 15-inch monitor using the same computer. Because two subjects engaged in the computer task simultaneously, they used noise-canceling headphones to eliminate any extraneous environmental noise.

Procedure

Two subjects participated within the same laboratory space at the same time, although on independent computers that were in no way connected, and were faced away from each other to avoid any interaction between participants. Informed consent was established through a general consent form, which described what subjects should expect from participation. The experimenter next collected the participants'

demographic information including sex, age, and ethnicity. Finally, the experimenter requested the name and telephone number of a friend or family member who knew the participant well to serve as a reference for a follow-up questionnaire. Participants were then orally given a broad explanation of the study as investigating aspects of communication in group tasks, and told that they would be “playing the role of a guesser in a guessing game”. The experimenter delivered scripted, oral instructions, pausing at prescribed points to receive affirmation that the participants understood the procedure. The subjects' task in all four experiments was to listen to each audio recording and try, via keystroke, to correctly identify which of the four visually-presented quadrants the talker was describing.

Computer task

The experiment consisted of a computer task in which the subject was presented with 30 random trials, which each included a matched audio file and visual slide from the previous four talking studies. The talkers' audio recordings were prepared to be stimuli for this study by separating each talker's five middle trials into independent files that contained only the instructions from one of those trials. The talkers' announcement of the slide number and target quadrant letter was trimmed from the end of these recordings. The E-prime program randomly selected which thirty of the resulting 600 audio/visual talker trials would be presented for each participant, so every subject saw and heard trials from all four conditions of talkers. The slides shown to the listeners with the audio recordings were the same visual stimuli that were used for the first four studies. Each slide, as for the earlier subjects

doing the task, was numbered in the upper right-hand corner of the screen and was divided into four quadrants, labeled quadrants A through D. In each of the quadrants was a set of four geometric shapes (See Figure 1). Listening subjects were unaware that the talkers had varying interpersonal impression motivations.

For each trial, the “guesser” listened to a recorded, verbal description by a talker, and then indicated which quadrant they thought was being referenced, via keystroke (i.e. A, B, C, or D). We asked them to only answer when they were at least 95% sure of the correct quadrant to preclude premature guessing. Each trial recording played only once, and could not be repeated, although answers could be changed by choosing a different key at any time while the audio recording was still playing. Once the audio-recording finished, a screen prompted the participant to make their final answer, during which time participants could make a first guess, change their answer, or keep their answer the same (by hitting the space bar). A sample trial progression is shown in Figure 5, below. Some of the recorded instructions were very short, and some were much longer, but all recordings played all the way through regardless of when the listener chose a quadrant. In cases where the listener still felt unsure of which quadrant was being described after the recording had ended, the listener was instructed to then provide his or her best guess as the response.

Once participants provided a quadrant response, they then answered seven questions regarding the foregoing slide and talker. On a 5 point scale (1 = not at all, 2 = a little, 3 = some, 4 = a lot, 5 = totally), participants were asked, “How confident are you that you got the last slide correct?” The remaining six questions were answered on

a scale from 1-9. For these last questions, a series of anchors were provided to guide subject response (1 = not at all, 3 = slightly, 5 = average, 7 = very, 9 = extremely), but participants were explicitly told that any number on the scale could be chosen, regardless of whether it was an anchor number. The questions consisted of: “How difficult do you think it was to describe this slide?”; “How good at describing the slide was the talker?”; “How intelligent do think the talker is, in general?”; “How efficient with words do you think the talker is, in general?”; “How friendly do you think the talker is, in general?”, and “How talkative do you think the talker is, in general?”

As with the previous experiments, the participants completed 1-3 trials while the experimenter was present, to make sure the software was functioning properly and the subject understood and correctly followed the procedure. After these supervised trials, the experimenter moved into the hall, and the subjects completed the remaining trials alone. All thirty trials were used in data analysis. Upon completion of the thirty trials, each participant was asked to state what they believed was the focus of the research study. This information was recorded, and the computer task terminated. Once the computer task had ended, the participant retrieved the experimenter from the hall.

Debrief

As the final component of the procedure, the experimenter debriefed the subject on the purpose of the study. In an effort to maintain the integrity of the study, the experimenter then received a verbal consent from the participant that he/she would not disclose the purpose or procedure of the study to anyone outside of the lab.

Results and Discussion: Experiment 1e

To check whether our chosen measures of verbosity tapped into what makes people appear talkative to others, we ran bivariate, correlational analyses between subjects' ratings of talkers' "talkativeness" and talkers' word counts, MLUs, and rates of speech. This check validated all three measures by showing significant, positive correlations for word count ($r = .38, p < .001$), MLU ($r = .19, p < .01$), and speech rate ($r = .54, p < .001$). Our subject listeners did, indeed, find those talkers who used more words, talked longer, and especially those who talked faster, to be more talkative, indicating that our operationalization for talkativeness was appropriate.

This finding that people who talked more were rated as more talkative by our listeners prompted us to run a bivariate correlation between these listener ratings of talkers' talkativeness and the previously-collected ratings from the talkers' personal contacts to see if the impressions of these populations would align. This analysis proved to be non-significant ($r = .09, n.s.$), indicating again that perhaps the talkers' verbal output in the lab was not a direct reflection of their output outside the lab.

Next, we turned to examining how effective the talkers were at conveying the correct instructions and the stated personal impressions to the listeners (i.e. intelligence, friendliness, and efficiency with words).

Objective accuracy measure

An accuracy score was calculated for each talker that reflected the average number of trials listeners got correct for each talker. For example, if a talker's recordings got played 30 times, and the listeners chose the correct quadrant for 18 of

those trials, the talker's accuracy score would be 18 out of 30 or .60. We ran a one-way ANOVA comparing the talkers' accuracy scores by condition, to see if having any of the interpersonal motivations helped or hindered the talkers from accurately conveying the correct quadrant to choose to the listeners. The result was non-significant, so there was no effect of condition on talkers' accuracy at conveying the correct information.

We next looked at how talkers' verbosity related to their accuracy by running a bivariate correlation between their word count, MLU, and speech rate with their accuracy scores. We found that for both word count and MLU there were significant correlations ($r = .18$, $p = .01$; and $r = .21$, $p < .01$, respectively), indicating that as the number of words used and the time spent talking increased, so did the accuracy scores. Speech rate, on the other hand, showed a non-significant correlation with accuracy ($r = -.02$, n.s.), so speech rate did not vary with accuracy scores for this task.

Sex analyses

There was no main effect of sex for accuracy scores, so the sex of the talkers did not affect ability to convey instructions to listeners.

Subjective impression measures

To examine how the conditions may have impacted listener ratings of the talkers' talkativeness, efficiency with words, friendliness, intelligence, and skill at the talking task, we ran analyses comparing the average ratings in each of these categories between conditions. The only rating category that was marginally significant ($F(3, 193) = 2.26$, $p = .08$) was that of friendliness, where the pairwise comparison revealed that talkers in the Friendly condition ($M = 5.52$, $sd = .09$) were rated to be

significantly more friendly than talkers in the Efficient condition ($M = 5.19$, $sd = .09$; $p = .01$). This showed that the talkers by and large were not successful in conveying the given personality traits to an extent that was above and beyond what any of the other conditions portrayed, though being told to "seem efficient" caused talkers to portray somewhat less friendliness than those asked to "seem friendly."

This finding, in conjunction with our previous study findings (i.e. that talkers had adjusted their verbosity in response to the various conditions), confirmed our interest in looking at how the talkers' verbosity might have related to the listener ratings, if at all. Bivariate correlations were run between each of the rating categories and our three measures of talkativeness (i.e. word count, MLU, and speech rate). Word count yielded significant, positive correlations (all $ps < .001$) with ratings of friendliness ($r = .287$), intelligence ($r = .276$), and skill at the task ($r = .270$), revealing that increasing the number of words used, regardless of condition, went along with getting higher ratings across all these categories. Listeners also reported higher ratings about their own confidence that they were able to identify the correct quadrant when there were more words used by the talker ($r = .241$, $p = .001$). Across almost all the rating categories, in short, it when the talker used more words the talker also got better ratings.

Our speech rate measures showed much the same pattern of positive, bivariate correlations with listener ratings, where friendliness ($r = .445$), intelligence ($r = .285$), and skill at the task ($r = .302$) were all significant (all $ps < .001$). The pattern for speech rate did prove to be somewhat different, however, because ratings of talkers'

efficiency ($r = .308$, $p < .001$) was also positively correlated with speech rate (where this correlation was non-significant for word count); meanwhile, listeners' confidence in their correctness was not correlated ($r = .07$, n.s.) with speech rate, though it was correlated with word count. In sum, talking faster yielded higher ratings from listeners in almost every single category, but seemingly at the expense of listeners' confidence that they understood the directions correctly.

The analyses of the relationship between the listeners' ratings and talkers' MLUs were not as strong and unanimously advantageous, although still revealed significant positive correlations for ratings of intelligence ($r = .183$, $p = .01$), and for skill at the task ($r = .167$, $p < .05$); ratings for friendliness, however were only borderline significant ($r = .137$, $p = .06$), and not significant for efficiency ($r = -.30$, n.s.). Talking for a longer amount of time did not necessarily go along with receiving higher ratings from listeners in all the categories, though it did positively influence ratings of talkers' intelligence and task skill.

Discussion

Our results from these analyses showed that when measuring individuals' talkativeness it was useful to track word count, MLU, and speech rate, and interesting to then examine how the measures are related. Although all of these measures correlated with listeners' impressions of how talkative the talker was, it was notable that rate of speech showed a remarkably high association. Fast talkers were found by listeners to be very talkative, and talkers who used more words somewhat less but still strongly so, and who talked longer were only viewed to be mildly so. The difference in

correlation strength is interesting, and indicates that perhaps the quality of a person's "talkativeness" may be best captured by speech rate and word count, and less so by MLU. However, because listeners could identify the quality of being talkative via all these measures, we turned to how these measures of talkativeness might relate to other interpersonal impressions that the listener may have formed about these talkative individuals.

Our pattern of results are contrary to the intuition that one should speak deliberately and judiciously to convey positive personal attributes to listeners, because it appeared in our studies that if one intended to make a positive impression on listeners in terms of efficiency, intelligence, friendliness, and skill, one could do so by using more words and speaking more rapidly. Indeed, using more words and talking longer even helped the listeners to arrive at the correct answers in this oral, directive task. Though it is significant that one might do well to avoid talking for too much time, because the impression ratings longer MLUs engendered were mixed and not so clearly beneficial for the talker.

Our next step in our research was to examine whether these findings about verbosity would hold true in the back-and-forth communication that occurs in real time social settings, as well as with a different oral task. This lead us to run an experiment that allowed in-vivo interactions to happen in the lab while collecting many of the same measures, though on a different, dyadic task.

CHAPTER 3. EXPERIMENTS 2A - 2B

Methods: Experiment 2a

Participants

One hundred twenty-two students from the University of California, San Diego participated in this experiment in exchange for course credit. Participants consisted of 44 males and 76 females that were randomly assigned to groups of two. Data were excluded from analysis in the event that participant refused to sign audio-consent forms. Data from two participants (one pair) were excluded for this reason, leaving data from 120 participants viable for analysis. The final makeup of the dyads was 10 sets of same-sex males, 26 sets of same-sex females, and 24 sets of opposite-sex partners. The ethnic makeup of participants consisted of 16.7 % White/Caucasian, 17.5 % Hispanic, 56.7% Asian, and 9.2% Other/Unspecified. Ethnicity was based on self-report.

Materials

Audio recordings were collected using two standard, USB microphones with one placed in front of each participant. Paper materials completed by the participants consisted of consent forms, a demographics worksheet, a short version of the HEXACO personality inventory (described below), a map quiz, and a partner evaluation form. An opaque divider separated the two participants, preventing them from seeing one another, though they could hear each other. A clock was placed in a central location of the room, visible to both subjects, to allow partners to manage time, since both phases involved a maximum time limit.

Procedure

Upon arriving, one individual from the pair of participants was placed on either side of the opaque barrier dividing the two halves of the room. This allowed the task to be purely oral, and eliminated any non-oral cues, like gestures, from contaminating the communication. Individuals seated on the left of the barrier became known as "Participant A", and those on the right were "Participant B". Informed consent was then established through two consent forms: the first was a general description of what they should expect from participation, while the second granted the experimenter permission to audio-record the session, as well as analyze subsequent data. In the event that a subject did not consent to being audio-recorded, the data from his/her group was excluded from analysis.

Next, the experimenter gave instructions to participants for independently completing a demographics form, as well as the HEXACO short form inventory (see appendix 1) that measured personality characteristics via self-reported agreement (on a 5 point scale of 1= Strongly Disagree to 5 = Strongly agree) to a series of 60 questions like, "If I had the opportunity, I would like to attend a classical music concert." and, "I would feel afraid if I had to travel in bad weather conditions." that tapped various personality characteristics. We were primarily interested in whether the inventory's scale of trait extraversion would correlate with subjects' oral production in the lab. Sample questions in this category were, "In social situations, I'm usually the one who makes the first move." and "I prefer jobs that involve active social interaction to those that involve working alone."

While the participants filled out the demographics and HEXACO packet, the experimenter waited in the hallway, and returned upon completion to begin the first stage of the experiment.

Stage 1: get-to-know-you task

This first stage of the study was meant to allow more naturalistic conversation to happen between the subjects, so we could compare their talkativeness during this type of interaction to that of their later, more restricted and task-oriented interaction. Participants were orally informed of the basic purpose of the study, which was to explore group communication strategies that arise in a purely oral setting. The barrier between them was then explicitly pointed out, and they were told that talking through it to each other would “be similar to communicating over the telephone”. The subjects were informed that they must work together on an upcoming task, and that their success or failure would be determined jointly. The instructor then introduced the first stage of the experiment, explaining that it was designed to allow the participants to feel more comfortable with each other while working together on the upcoming task. Each participant was given a half-sheet of paper with six questions, the first three of which were the same for both participants: “What is your full name?”, “What year and college are you in?” and “Where are you from?”. The three final questions were unique for both participant A and participant B. The questions for participant A were: “What are your favorite foods?”, “If you could spend an hour with anyone in the world, who would it be and why?”, and “If you could have super-powers, what would you choose and why?” Participant B's questions were: “What are your favorite TV

shows?”, “Where is your dream place to live?”, and “If you were stranded on a desert island what are the most important things would you want with you and why?” The pairs were instructed to alternate the asking and answering of questions and to ask the questions in the order written.

The order of questions was meant to start the conversation at a very surface, factual level (e.g. year in school) to allow the subjects to become comfortable with sharing information with each other a little more and then end with questions that called for more personal ideas and information to be revealed (e.g. dream place to live). Initial, pilot work with previous subjects had identified the six questions that were chosen to be these final questions were found to be the most interesting ones for subjects to answer. The current participants were informed that the questions were not meant to be restrictive, but rather to encourage a natural conversation, and were told to feel free to go off topic if they chose. However, they were instructed that they must get through the twelve questions within ten minutes, and were encouraged to take notes on their partner’s answers, as they may later be asked to recall the answers. The experimenter started the recording devices, and supervised the first one or two questions to ensure that participants understood the procedure. The participants were then told to inform the experimenter (who would be waiting in the hall) when they had finished this task, if they finished in less than the ten allotted minutes. Otherwise, once ten minutes elapsed, the experimenter would interrupt and announce that time had expired. In both scenarios, the experimenter paused the recordings, and proceeded to give instructions for the next stage of the experiment.

Stage 2: map task

This stage of the experiment was meant to engender more task-oriented communication between the subjects, which more closely mirrored the talking environment of the previous studies, and thereby allowed us to compare subjects' talkativeness between the two different talking situations. This also let us examine how subjects' talking may have been affected by the different environments of a naturalistic conversation and a task-oriented one.

Each participant was given a plastic ruler and one magnetic map, that consisted of an outline of an island with a few printed landmarks, such as forests and mountains, that gave the map its basic layout. They were also given another map, the "complete map," that also was made up of the same island outline and landmarks as the magnetic one, but included eight additional points of interest like a log cabin, a church, and an oasis. Subjects were each provided separately with the eight magnetic, points of interest icons that needed to be placed correctly onto their blank maps. They were also given a car icon magnet with no explanation about its significance, though it did not appear on either of the complete maps. Participants were instructed to orally describe their version of the completed map to their partner, so that the partner could recreate it on their blank one. In effect, participant A should create participant B's completed map on his/her blank map, via oral instructions from participant B, and vice-versa (See Figure 6).

The experimenter again stated that the participants were not allowed to bypass the barrier partition between them to visually signal to each other or show each other

the maps, to ensure that all information was conveyed orally. Finally, the experimenter again referenced the clock, and stated that the time limit for the experiment was twenty minutes, and that he or she would interrupt the task when twenty minutes has elapsed, if the pair had not already finished and come to get the experimenter before this limit. The experimenter resumed the recording, and stepped into the hall.

Upon returning, the experimenter stopped the recording, and informed the participants that no more talking would be allowed until the experiment was over. The experimenter then handed both participants a map quiz consisting of five map navigation questions, each specific to his or her unique map. Participants were given instructions to answer all five questions, and to make a best guess if needed. Each question gave a different starting point on the magnetic map (e.g. "Place your car magnet at the center of the Western-most forest"), gave a series of specific directions (e.g. "Drive directly north."), and finally asked participants to write down what specific icon or landmark was the ultimate destination of the directions (e.g. "What is the first thing you come to that fully blocks your way?"). We made success of the quiz questions contingent on the icons being correctly placed relative to each other and to the map landmarks, rather than on being placed exactly in the same position as on the original map, because this seemed to be a more realistic measure of successful communication. I.e. the placement being off by a millimeter seems less of a failure of communication than having the placement in relationship to the other icons and landmarks be off, such as to preclude successful navigation. When this quiz was completed by both participants, the experimenter gave each a Partner Evaluation

Form, which asked each participant to rank his/her partner in ten categories: intelligence, friendliness, efficiency with words, skill at the map task, talkativeness, leadership on the task, teaching skill, listening skills, belief that partner enjoyed the map task, and desire to work with the same partner again. Ratings were on a scale of 1 to 7 (1 = completely disagree, 4 = neutral, 7 = completely agree). The experimenter informed participants that this final form would be completely private and anonymous, and requested that participants be as straightforward and honest in their ratings as possible.

Debrief

As the final component of the procedure, the experimenter debriefed the subject on the purpose of the study, namely the investigation of communication during purely verbal group settings. In an effort to maintain the integrity of the study, the experimenter then received a verbal consent from the participant that he/she would not disclose the purpose or procedure of the study to anyone outside of the lab.

Results and Discussion: Experiment 2a

Again, for this study we excluded outlier talkers who attained an anomaly index rating of more than 2.5 in a preliminary SPSS analysis. Three outlier individuals were identified in this manner, and due to the dyadic nature of the study, this lead us to exclude both the outlier and his or her partner. Therefore, three dyads were excluded from our analyses, leaving sixty study pairs that were included.

Our audio equipment did not allow us to record each person in the dyad separately, since the microphones picked up both participants' voices, albeit with the

closer person noticeably louder for each microphone's recording. Additionally, the in-vivo nature of the study allowed for the participants to interrupt each other, talk over each other, and request and provide further elaboration from and to each other during their interactions for both the question and answer session and the map task session. This meant that we could not easily and accurately determine the subjects' MLUs or speech rates for this study, so used only word count as the operationalization for talkativeness for all the analyses. To attain the word counts we faithfully transcribed every utterance of the target speaker (Person A or Person B) separately, including the vocal pauses, and then counted each utterance as a word. Further, we went through the question and answer session transcriptions and separated the talking that was in direct response to the questions assigned by the experimenters from the talking that was extraneous and off-topic for the question at hand; this gave us a measure for how much of the talking during the question and answer session was on-topic versus off-topic for each person for each question. The way that we determined what was on-topic was if any part of the sentence or phrase was responding to the question originally and directly, rather than starting a different topic or main idea. If the sentence or phrase was deemed to be on-topic, we included the entirety of it in the on-topic word count. Importantly, we did not include clarification repetitions that were initiated by the partner, but did include those repetitions that were un-prompted. For example, one transcribed, full response to the question about favorite television shows was, "Right now it's Archer. Archer. Archer Uh like A-R-C-H-E-R. It's uhh ... it's this, it's like a spy comedy kind of thing it's a cartoon it's kind of like family guy but

yea. Yea." And the final, on-topic transcription was, "Right now it's Archer. It's uhh ... it's this, it's like a spy comedy kind of thing it's a cartoon it's kind of like family guy but yea. Yea." We did not count the repetitions of "Archer" and the word in the phrase that spelled the title because they were in direct response to the partner asking for repetition and spelling, so were not spontaneously produced utterances by the talker. In addition, any time the talker was sharing their response to a question that was meant to be for the partner (i.e. providing his or her own answer to one of the questions he or she had asked the partner), or bringing up a new subject and discussing that, we counted this talking as off-topic.

A bivariate correlation between the participants' word counts during the question and answer session and the map task showed a significant, positive correlation ($r = .25, p < .01$), showing that participants did maintain their verbosity between these two lab activities. Participants were increasingly consistent in their level of talkativeness throughout the study, as shown by the increase in correlations between the word counts from the first of the elaborative questions to the last one (see Table 3).

Objective accuracy measure

Each partner in the dyad answered different questions during the get to know you portion of the study, and recreated and navigated around a different map for the map task (i.e. Person A recreated & navigated map B, and Person B recreated and navigated map A); therefore we ran a one-way ANOVA comparing the word counts for Persons A and Persons B during the question and answer session to see if one set

of questions systematically engendered more talking, and another ANOVA comparing accuracy scores for Map A to those of Map B to see if there was a systematic difference between the difficulty of the maps. For the question and answer session, there was no difference in word counts between the two sets of questions ($F(1, 118) = .25, p = .62$). Therefore, the varied content of the questions did not evoke systematic differences in the amount that participants talked in answering them. We did find that there was a difference in the accuracy scores between the two maps ($F(1, 118) = 5.29, p < .05$). Map A (accuracy $M = 2.4, sd = 1.36$) proved to have been slightly easier to recreate and navigate than Map B ($M = 1.88, sd = 1.09$). Because of this disparity in difficulty, we checked to be sure that there was no systematic difference in word count for the map task by running another one-way ANOVA of word count during the map task between Persons A and B. This proved to be non-significant ($F(1, 118) = 1.43, n.s.$), indicating that the difficulty difference did not lead to a systematic difference in participants' talking that would affect any of our measures and results.

Next we checked whether accuracy on the map task was related to the amount that participants talked (or heard) during any part of the study (i.e. the question and answer session or the map task) by running bivariate correlations between word counts and accuracy scores. None of the correlations proved to be significant, indicating that the amount that participants talked together did not affect either their own, or their partners' accuracy. The partners' accuracy scores did correlate significantly with each other ($r = .27, p < .01$), though, indicating that the dyads succeeded or failed together at the map task. In this study, the amount that a person talked was not related to

accuracy in the map task, but the person's accuracy was positively correlated with his or her partner's accuracy.

Sex analyses

Men and women did not differ overall in the amount that they talked during either the question and answer session or the map task, but the sex makeup of the dyads did have a marginal effect on word count. An ANOVA comparing same-sex: male, same-sex: female, and opposite sex dyads was marginally significant for the map task ($F(2, 117) = 2.68, p = .07$). The pairwise comparison showed that this was due to the same-sex: female dyads ($M = 1407, sd = 353$) talking marginally more than same-sex: male dyads ($M = 1231, sd = 346$) and opposite sex dyads ($M = 1271, sd = 351.59$); both $ps = .06$). This means that pairs of women were marginally more talkative during the map task than pairs of men or opposite sex pairs were.

Subjective impression measures

We had asked subjects to rate their partners' talkativeness, intelligence, friendliness, efficiency with words, teaching skill, listening skill, skill at the map task, enjoyment of the map task, and leadership during the map task. We also asked subjects to rate their own desire to work with the same partner on a future task. To examine how verbosity may have impacted listener ratings of their partners, we ran bivariate correlations between subjects' word counts during the question and answer session and during the map task.

The question and answer word counts were positively correlated with ratings of talkativeness, confirming that subjects deemed partners that used more words

during this session to be more talkative ($r = .29, p < .01$). When the question and answer session word counts, however, were divided into on-topic versus off-topic content, only the word count for off-topic content maintained the correlation ($r = .29, p < .01$), while the on-topic word count correlation became non-significant ($r = .03, n.s.$). Additionally, ratings of how good a teacher their partner was ($r = .18, p < .05$), and how much they thought their partner enjoyed the map task ($r = .18, p < .05$) were correlated with the question and answer total word count. These correlations were again found to be driven by the off-topic content word count, as the correlations remained marginally significant for ratings of teaching skill ($r = .16, p = .08$) and improved slightly (though non-significantly) for task enjoyment ($r = .20, p < .05$), but went to non-significant levels for both these areas with the on-topic word count correlations ($r = .12, n.s.$; & $r = -.02, n.s.$), respectively). Please see table 4 for all of these correlations. It seems that the significant correlations with ratings of talkativeness, teaching skill, and map task enjoyment was entirely due to how much "extra " talking the partners initiated and engaged in during the question and answer session rather than to how many words partners used to answer the questions directly. No other significant correlations were found between the question and answer word counts and the impression ratings.

In examining the bivariate correlations of these same impression ratings with the word counts during the map task, it was interesting to see that talkativeness was no longer significantly correlated ($r = .09, n.s.$). There was a significant negative correlation with ratings of wanting to work with the partner again ($r = -.21, p < .05$),

and a marginal one with ratings of the partners' listening skill ($r = -.15$, $p = .10$). By the time the map task occurred, impressions of partners' talkativeness and teaching ability seem to have been formed, regardless of how much more (or less) talking happened during the map task, though determinations of partners' listening skills and whether participants would like to work with them again were related to word count during the map task.

Sex analyses

Although men and women overall did not differ in the amount that they talked during any part of the study, the sex make up of the dyads did have significant effects on the ratings (See Figure 7). Specifically, ANOVAs of the different rating categories using the sex makeup of the dyads (i.e. same-sex: female, same-sex: male, or opposite sex dyads) as the independent variable revealed that same-sex: female dyads were significantly lower in their ratings of their partners' intelligence ($F(2, 117) = 6.60$, $p < .01$), listening skills ($F(2, 117) = 4.47$, $p = .01$), and enjoyment of the map task ($F(2, 117) = 3.57$, $p < .05$), and marginally lower in rating their partners' talkativeness ($F(2, 117) = 2.79$, $p = .07$). The pattern of ratings across all the categories, in fact, showed that female pairs produced the lowest ratings, while male pairs produced the highest ratings, with opposite-sex pairs' ratings falling somewhere between these two. To test whether this pattern was due to female raters being prone to giving lower ratings to whoever their partners were, while males tended to be more generous in their partner ratings, we ran ANOVAs of the ratings for only the 24 opposite sex pairs, with sex as the independent variable. If women were typically lower raters, then this analysis

should have shown a significant difference between the males' and females' ratings of each other in the opposite sex pairs. This did not prove to be the case for any of the rating categories, indicating that women are simply hard on each other in pairs, while men are relatively generous with each other, and that these tendencies do not extend to their ratings of the opposite sex.

HEXACO personality inventory

The HEXACO-60 personality inventory (Ashton & Lee, 2009) contains a scale that was potentially relevant to our topic called "Extraversion," which is made up of the subscales (or facets) of "social self-esteem," "social boldness," "sociability," and "liveliness." Each of these subscales is associated with two or three items on the inventory. A bivariate correlation was run between these items (and their subscale and scale aggregates) and both the talkativeness measures, and the partners' impression ratings. Our purpose was to see if the subjects' responses to these personality questions were related either to the number of words the subjects used during any part of the experimental session, or to the partners' impression ratings, or to both of these measures.

Word count for the question and answer session did not correlate with the HEXACO-60 at any level, except for marginally ($r = .17, p = .06$) with item number 34 which read, "In social situations, I'm usually the one who makes the first move." The map task word count, however, did correlate modestly with the Extraversion Scale ($r = .21, p = .02$), and two of its subscales: "social boldness" ($r = .21, p = .02$) and "sociability" ($r = .21, p = .02$). It may be that the longer time period of the map

task (and the fact that it was later in the experiment) allowed for subjects to relax more and to also express their extraversion by talking more.

Discussion

Again, we found in this study that our word count measure was able to capture some of the qualities of speech that lead subjects to find their partners to be more or less talkative. It was interesting that this impression was formed early in the interactions (i.e. during the initial question and answer phase) and then was not necessarily related to how much individuals continued to talk during the later map task, even though we also found that individuals' word count during the question and answer session and the map task were correlated. People did not alter their quantity of talking between tasks, but it may be that the map task affected the quality of the talking that occurred, in the sense that it did not afford as much latitude for off-topic talking as the question and answer session. Because it was shown that the off-topic content of the question and answer session accounted for the correlation with talkativeness ratings, while the on-topic word count did not, it may be that this quality difference in talking during the map task accounted for the failure of its word count to correlate with the talkativeness ratings. It would be interesting, in the future, to do a study specifically designed to allow analysis of the speaking content for task-oriented discussions and divide its word count into how much was on-topic versus off-topic to see if a correlation with only the off-topic content and the talkativeness ratings would then be significant. This would tell us whether this trait of "talkativeness" might hinge on the content of the speaking during interpersonal interactions (i.e. on- or off-topic)

more than on the sheer amount of speaking that occurs. Unfortunately, the design of this study did not make this analysis practical.

In determining whether subjects would like to work with the same partner in the future, it was shown that the partners' word count was significantly negatively correlated, indicating that partners who talked more during the task were not enjoyed as much as partners. This may have been a result of the subjects also finding that partners who talked more were also rated to be poor listeners.

In regards to sex differences, we again found that men and women spoke the same amount during all periods of this study, though women who were paired together had a slight tendency to talk more during the map task. Female pairs also rated each other more harshly than either males pairs, who showed the opposite pattern of rating each other highly, or opposite sex pairs did (see figure 7). This finding in female pairs was somewhat surprising, since many studies have found that in peer ratings there is usually a same-sex bias where females rate other females higher the same way that the males in our study did (e.g. Zimmer-Gembeck, Waters, & Kindermann, 2010). It is unclear what may have been behind this gender difference in ratings of each other for the women in our study, and perhaps deserves more focused research attention in the future. It would be useful if one partner's input could be standardized, for instance by using a confederate, so that the sex of the confederate would be the only independent variable; this would afford the opportunity to test whether female subjects will rate the female confederate lower than a male confederate, despite the fact that their input was the same.

Though the question and answer session of this study provided subjects an opportunity to speak extemporaneously and use their imaginations to answer the questions posed, as we intended, the current study parameters did not provide the ideal environment in which to evaluate how these answers might impact others' impressions of the respondents' creativity, because the question and answer session happened prior to many other oral interactions before subjects had a chance to rate each other. Therefore, we used the answers as stimuli for a follow-up study to more cleanly examine the question of how verbosity might relate to others' impressions of talkers' creativity. We were interested to know whether the responses of the talkers would be rated differentially by subjects as a function of how many words the talker had used in his or her answer.

Understanding how talkativeness affects interpersonal perceptions of an individual's creativity and interestingness is another area that is important to explore, as it may be a key component of how others choose whom to associate with in both personal and business situations. Creative and interesting people, presumably, are ones that are more attractive to others; since it remains empirically unclear whether a talkative person would be found tiresome or intriguing to listeners, we asked for others' impressions of individuals' answers to our "get to know you" questions and related the resulting ratings to our talkativeness measures.

Methods: Experiment 2b

Participants

One hundred seventy-six students from the University of California, San Diego participated in this online experiment in exchange for partial course credit.

Materials

Participants used their own personal computer or other internet-capable device to log on to the study internet site that was hosted by the UCSD Psychology department's server. The study was programmed using HTML and PHP, and participation required that the subjects be able to view and read the on-screen instructions and stimuli, and to have a numerical input device to respond to the study questions. There was no sound for this study.

Procedure

Stimuli

The stimuli for this study were the verbatim, transcribed answers from 117 randomly-selected, group study participants' get-to-know-you, elaborative questions detailed previously. In an attempt to maintain fidelity between the oral and written presentation of these responses, the transcriptions included all verbal pauses such as "um" and "ah," and maintained any grammatical or vocabulary errors that the respondents had made.

Computer task

The first screen of the online study provided informed consent as approved by the University of California, San Diego Human Research Protection Program.

Participants were notified that by typing in their university user name in the bottom box, they were acknowledging that they had read the consent form completely, and were consenting to participate in the study, though this information was in no way connected to their study ratings, which would remain anonymous.

For every participant the study program randomly selected one of the six possible get-to-know you questions, that had been answered by the previous group talk subjects, to present to the current participant. This one question then appeared at the top of the screen throughout each trial for that participant. Subjects then saw one randomly-selected, transcribed response to this question (as answered by one of the group talk subjects in the previous study) in a text box below the text of the question. After the participant had read the response, he or she rated at the bottom of the screen to what extent the response indicated that the respondent possessed a series of six personal qualities on a scale of 1 ("completely agree) to 7 ("completely disagree), with a rating of 5 being "neutral." The personal qualities were specifically whether the respondent seemed "friendly," "interesting," "efficient with words," "creative," "intelligent," and "talkative" (For an example of one trial, see appendix 2). There were 12 trials identical to this for each participant. Presentation order of the personal qualities to be rated was counterbalanced on each of the 12 trials to preclude any order effects.

Interspersed throughout the 12 target trials were up to three "catch" trials that had written instructions as follows: "Hi there! This isn't the text to a real answer to a question, but you'll need to read it every time it appears in order to get the trial correct.

This is a check to make sure that you're reading these responses all the way through. Please just mark each of the below ratings with a 6 to prove that you read this text. Thank you!" The number that the subject was asked to fill in was randomly assigned (between 1-7) for each catch trial. Any participants that did not respond accurately to any one of these trials were excluded from these analyses.

Debrief.

Upon completing all trials, a screen appeared thanking the participant and providing contact information should he or she have any further questions regarding the study.

Results and Discussion: Experiment 2b

Due to the fact that the audio recordings included extraneous aural information (e.g. interjections and comments from the partner), we elected to use transcriptions of the participants' responses to the three, elaborative questions from the previous study, which did not include this "extra" information. The transcriptions included every utterance the respondent produced in response to the questions, including all vocal pauses, and our word counts were based on counting the utterances from these transcriptions. We computed each respondent's average word count, and also calculated the respondent's average rating from all subjects that rated that respondent's answers for each impression category (i.e. creativity, interestingness, intelligence, friendliness, efficiency with words, and talkativeness). We also compared the ratings of current subjects to the ratings collected from the previous study, to see if they

agreed with each other, or if the additional interactions of the previous study did impact the partners' ratings.

We first wanted to check that subjects would identify respondents whose answers they read had higher word counts as being more talkative (even though the stimuli weren't auditory, but were visual) by running a bivariate correlation between these two measures.

The correlation was very high, and significant ($r = .74, p < .001$), indicating that subjects who read more words from a respondent also felt that the respondent was more talkative. This might be at least partially because the written words took up visual space, as well as took time to read. A perception paper by Ono and Kawahara (2007) showed that the size of a visual representation was positively correlated with subjects' perception of how long the stimulus was presented. They showed participants the same sized, white circle on a screen that was either alone or surrounded by a black circle (which made the white circle appear to be smaller). When the white circle looked larger, it was also judged to have been presented longer than the same sized circle with the black circle around it that appeared smaller, even though all the stimuli were presented for the same amount of time. The duration of each presentation was very short in this study, so people are presumably quickly able to make spatial size determinations that directly influence duration perception. Therefore, because subjects in our current study were able to see how "big" each answer was (i.e. how much of the screen contained text for each answer), as well as be able to directly experience the differing amounts of time that it took for them to read

the text, it may have lead to an even more inflated perception of how much each talker with more text talked. This exaggerated perception would allow for a higher correlation between "larger" statements and more talkativeness.

Next, we looked at whether there was a relationship between the average word counts of the respondents and the ratings that the current subjects gave them. All the ratings proved to be significantly or marginally correlated with average word counts except ratings of intelligence. Specifically, ratings of respondents' creativity and interestingness (both $r_s = .27$, $p < .01$), and friendliness ($r = .49$, $p < .001$) were positively correlated with word counts so that the more words were used, the higher the subjects rated the respondents in these categories. Respondents' word counts were marginally negatively correlated with subjects' ratings of their efficiency with words ($r = -.17$, $p = .08$), indicating that more words were related to lower ratings of efficiency. So, it seems that word count did have some kind of relationship with subjects' perception of talkers' personal qualities.

None of the ratings given by the previous study subjects correlated significantly with those given by the current study subjects. This suggests that there may have been something more than just the question and answer question responses that influenced the previous subjects' ratings, which is not surprising since the question and answer interaction was only a small proportion of the interactions the previous subjects had with the respondents.

Discussion

We confirmed once again that our word count measure was able to capture the quality of a talker's "talkativeness," and also extended its validity to the realm of the written form of language. It also seems that using more words increases others' ratings of one's creativity, interestingness, and friendliness, though perhaps at the expense of one's apparent efficiency with words.

Subjects rated high talkers highly, which mirrors findings of previous studies (Bass, 1949; and Norfleet, 1948), and extended these high ratings into the area of creativity, interestingness, and friendliness. We did find, however, that subjects were somewhat discretionary and did not always give high ratings when more talk occurred, as was evidenced by the fact the higher talking was related to lower efficiency ratings.

The relative fertility of the minds of talkative individuals and reticent ones remains an issue that these findings cannot address fully. It is clear that subjects found the responses that were more verbose to be better responses, but it is unclear in which direction the correlation runs. It may be that the presentation of more words is more pleasing to the listener, and this alone causes a halo effect of making a better impression. It may also be the case that it was the better ideas that engendered more words and thus led to making a better impression on the listener. A future study that is experimental in nature is called for that would help disentangle these two explanations.

GENERAL DISCUSSION

The purpose of this dissertation was to explore whether talkative people had more or less success in leaving a positive interpersonal impression on others; in conveying information to others accurately; and in being judged by others to be more or less creative and interesting than less talkative people. We measured talkativeness by quantifying how many words (or utterances) subjects used while speaking, the total duration of time one spent speaking (MLU), and the rate at which one spoke (words per minute, WPM). Our findings in all of the studies supported these operationalizations of talkativeness, since ratings of talkativeness increased in accordance with each of these measures. It is notable that WPM showed an especially high correlation, which was followed by a strong correlation for word count. MLU, while significant, did show the weakest correlation with ratings of talkativeness, so it would seem that perhaps this measure is not the best one to use in further studies of talkativeness when the others show a much stronger relationship with this construct.

Experiments 1a through 1d revealed that people overall did not change their talkativeness in order to convey the personal trait of intelligence, but that they did reduce their word count and their WPM in order to convey the personal trait of efficiency. This is an especially interesting finding when paired with that of experiment 1e, which found that listeners actually rated faster talkers as being more efficient, and did not see a relationship between how many words were used and talkers' efficiency. It would seem that perhaps what individuals view to be the

characteristics of an efficient talker differs markedly when they are the talker versus when they are the listener. This is an area that calls for more exploration.

It was also unexpected to find that males in experiment 1c, who were tasked with seeming friendly, reduced their verbosity and speech duration the way they did, while females in this experiment did the opposite and increased the number of words they used and their MLU. The resulting ratings of listeners in experiment 2e confirmed the females' strategy, by showing that talkers who talked more garnered higher ratings on friendliness. It is puzzling that the males' talking behavior was in direct opposition to what could be considered the intuitive (and according to the results, appropriate) change in verbosity. There appears to be something about the effect on verbosity of being male and being asked to seem friendly that needs to be explored further. Maybe males were intimidated by this request, and were therefore having more difficulty speaking under this condition. Perhaps males felt that holding back and speaking less was conveying less dominance and therefore more friendliness. Again, this might be an area that is ripe for some study.

We also discovered in experiments 1a - 1d that when individuals were motivated to convey accurate task instructions along with a specific personal trait (e.g. to seem intelligent) to others, they used fewer vocal pauses and more content words than when they were only tasked with conveying accurate instructions. Perhaps there was something about having the extra cognitive level of the task (i.e. to make a specific interpersonal impression) that focused individuals on the task more and helped them to come up with content words rather than vocal pauses. It would be

interesting to explore whether any additional cognitive task would have this effect (e.g. asking them to pay attention to and report later some aspect of the task, such as how many circles they saw), or whether it was the interpersonal presentation aspect of the extra load that engendered these results.

Another finding was that using more words and speaking for a longer duration when one was the talker in these first experiments had the effect of improving the ability of the listeners in experiment 1e to get the correct response, since accuracy improved as these values increased. It seems that more words was associated with better communication for this study. Experiment 2a, however, did not show this "more is better" relationship between increased verbosity and increased accuracy. Indeed, there was no relationship found between these variables at all. The simple change in task between these experiments may have caused this different outcome. It may also be that the increased accuracy with increased verbosity that was found with the first experiments was at least partially due to the fact that the talkers and listeners were always new to each other. In effect, each talker for the listener in experiments 1e was a completely new communicator because there was no familiarity between conversants, so using more words may have been the best (and only) way to get the information across more effectively. Whereas, when conversants had longer interactions, as they did with experiment 2a, they were able to grow accustomed to (and perhaps even adjust for) each other's communication styles so that they maximized understanding between each other. The resulting improved communication in other areas like pragmatics and vocabulary choice, etc. would thereby have made using more words

less relevant to conveying information accurately. Indeed, the fact that we found that pairs succeeded or failed at the task together may have been indicative of how well or poorly the pair was able to adjust their communication styles to match each other,

When we looked at how the sex makeup of the dyads in experiment 2a affected verbosity, we found that pairs of females used marginally more words in talking to each other overall. It appeared, however, that the increased communication did not engender increased positive impressions of each other, though, since females selectively rated female partners in this study lower than they rated male partners, and lower than males rated their male or female partners. Women in our study, for some reason, were hard on each other in personality ratings, which is a very interesting (and perhaps alarming) finding. Looking into this effect further would be a good area of research to see whether this is an anomaly or if, indeed, women's judgments of other women are prone to be more negative in such cooperative situations, and if so, why this might be the case.

Subjects in experiment 2a formed their opinions about their partners' talkativeness and teaching ability early in the interactions, because the word counts during the question and answer session correlated significantly with these ratings, while the word counts during the map task were unrelated to them. Interestingly, the significant relationship seemed to be between the number of words spoken during the question and answer session that were not in direct response to the questions asked, but were rather "extra" words that tended to be off-topic. Participants' ratings of the talkativeness and teaching skill of those who provided a lot of off-topic talking during

this session to be high. What did seem related to word counts during the map task was ratings of partners' listening skill and ratings of wanting to work with the same partner in the future; partners who talked more were rated to be worse listeners, and were less likely to be wanted for a future partnership. This suggests that although using more words and being found talkative during the semi-structured question and answer session predicted the positive result of being rated as a good teacher, using more words during the structured map task also predicted the negative results of being found to be a worse listener and a less desirable future partner. It is possible that dyads that were having a harder time communicating during the map task had to use more words, and that it was this task-difficulty that engendered the lower ratings, however.

The final area that was explored was the relationship between the number of words that talkers' spontaneously produced in response to fairly open-ended questions and the ratings that talkers would receive on their creativity and interestingness. The subject that was of interest was whether talkers that used more words would be rated higher or lower than talkers that used fewer words. What was found was that longer answers were associated with higher ratings. What remains to be tested is whether this relationship was driven by the fact that the longer responses were, indeed, of higher objective creativity and interest and were rated accordingly, or if something about the length of the responses positively influenced raters' judgment irrespective of the responses' objective quality.

The current research has served to illuminate new facets of how talkativeness is evaluated by others, and how it influences others' impressions of the talker. But this

remains a rich area for future research, with many further possible directions that could lead to more and better understanding of this trait. More exploration of how talkativeness might be cultivated in naturally shy individuals, and the results that this might have would be intriguing. It would also be good to look at the issue of whether being talkative is a product of a more fertile mind, or simply a behavioral byproduct of poor impulse control. Regardless of its origins, this research seems to make it clear that talking more is related to positive outcomes in a variety of ways, and relatively few negative ones, so perhaps it would be safe to err on the side of too much talk rather than too little when one has the choice.

APPENDIX 1.

HEXACO-PI-R

© Kibeom Lee, Ph.D., & Michael C. Ashton, Ph.D.

DIRECTIONS

On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement. Then bubble in your response on the provided answer sheet using the following scale:

5 = strongly agree

4 = agree

3 = neutral (neither agree nor disagree)

2 = disagree

1 = strongly disagree

Please answer every statement, even if you are not completely sure of your response.

Please provide the following information about yourself:

I am Person (circle) A or B

Sex (circle): Female Male

Age: _____ years

1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree

- 1 I would be quite bored by a visit to an art gallery.
- 2 I plan ahead and organize things, to avoid scrambling at the last minute.
- 3 I rarely hold a grudge, even against people who have badly wronged me.
- 4 I feel reasonably satisfied with myself overall.
- 5 I would feel afraid if I had to travel in bad weather conditions.
- 6 I wouldn't use flattery to get a raise or promotion at work, even if I thought it would
- 7 I'm interested in learning about the history and politics of other countries.
- 8 I often push myself very hard when trying to achieve a goal.
- 9 People sometimes tell me that I am too critical of others.
- 10 I rarely express my opinions in group meetings.
- 11 I sometimes can't help worrying about little things.
- 12 If I knew that I could never get caught, I would be willing to steal a million dollars.
- 13 I would enjoy creating a work of art, such as a novel, a song, or a painting.
- 14 When working on something, I don't pay much attention to small details.
- 15 People sometimes tell me that I'm too stubborn.
- 16 I prefer jobs that involve active social interaction to those that involve working alone.
- 17 When I suffer from a painful experience, I need someone to make me feel
- 18 Having a lot of money is not especially important to me.
- 19 I think that paying attention to radical ideas is a waste of time.
- 20 I make decisions based on the feeling of the moment rather than on careful thought.
- 21 People think of me as someone who has a quick temper.
- 22 On most days, I feel cheerful and optimistic.
- 23 I feel like crying when I see other people crying.
- 24 I think that I am entitled to more respect than the average person is.
- 25 If I had the opportunity, I would like to attend a classical music concert.
- 26 When working, I sometimes have difficulties due to being disorganized.
- 27 My attitude toward people who have treated me badly is "forgive and forget".
- 28 I feel that I am an unpopular person.
- 29 When it comes to physical danger, I am very fearful.
- 30 If I want something from someone, I will laugh at that person's worst jokes.

Continued...

1 = strongly disagree 2 = disagree 3 = neutral 4 = agree 5 = strongly agree

- 31 I've never really enjoyed looking through an encyclopedia.
- 32 I do only the minimum amount of work needed to get by.
- 33 I tend to be lenient in judging other people.
- 34 In social situations, I'm usually the one who makes the first move.
- 35 I worry a lot less than most people do.
- 36 I would never accept a bribe, even if it were very large.
- 37 People have often told me that I have a good imagination.
- 38 I always try to be accurate in my work, even at the expense of time.
- 39 I am usually quite flexible in my opinions when people disagree with me.
- 40 The first thing that I always do in a new place is to make friends.
- 41 I can handle difficult situations without needing emotional support from anyone else.
- 42 I would get a lot of pleasure from owning expensive luxury goods.
- 43 I like people who have unconventional views.
- 44 I make a lot of mistakes because I don't think before I act.
- 45 Most people tend to get angry more quickly than I do.
- 46 Most people are more upbeat and dynamic than I generally am.
- 47 I feel strong emotions when someone close to me is going away for a long time.
- 48 I want people to know that I am an important person of high status.
- 49 I don't think of myself as the artistic or creative type.
- 50 People often call me a perfectionist.
- 51 Even when people make a lot of mistakes, I rarely say anything negative.
- 52 I sometimes feel that I am a worthless person.
- 53 Even in an emergency I wouldn't feel like panicking.
- 54 I wouldn't pretend to like someone just to get that person to do favors for me.
- 55 I find it boring to discuss philosophy.
- 56 I prefer to do whatever comes to mind, rather than stick to a plan.
- 57 When people tell me that I'm wrong, my first reaction is to argue with them.
- 58 When I'm in a group of people, I'm often the one who speaks on behalf of the group.
- 59 I remain unemotional even in situations where most people get very sentimental.
- 60 I'd be tempted to use counterfeit money, if I were sure I could get away with it.

APPENDIX 2.

Study On Impressions

In this study you will carefully read a series of 12 responses to the question:
"If you could have super powers, what would you choose and why?"

These are real people's answers, and we are interested in how their responses affect the impression that they leave on you, the reader. After each response you read, you will rate your impression of the respondent's personality characteristics based on the content of the answer.

The originally-verbal responses were transcribed here verbatim, so any repeated words, incorrect words, or vocal pauses (e.g. "um" or "ah") are a reflection of what the respondent actually said. Misspellings, however, are due to the transcriber and are not part of how the respondent answered the question.

The scale you will use for rating is 1 - 7

"1" indicates that you "Completely disagree" that the person possesses that characteristic.

A rating of "4" indicates that you are "Neutral" about whether the person has that characteristic

A rating of "7" indicates that you "Completely agree" that the person possesses that characteristic

Completely disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Completely agree
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

Please do your best to use the full scale so that all the numbers are considered and used where appropriate.

Please select "Continue" to start the ratings

If you could have super powers, what would you choose and why?

Hmm. Hmm I'm not sure what exactly would count as a super power.
 Could you count like going through information faster as a superpower, uh I don't...
 I guess yeah I would do speed. Yea yea.

The respondent is friendly.

[illegible]

Completely disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Completely agree
1	2	3	4	5	6	7
						

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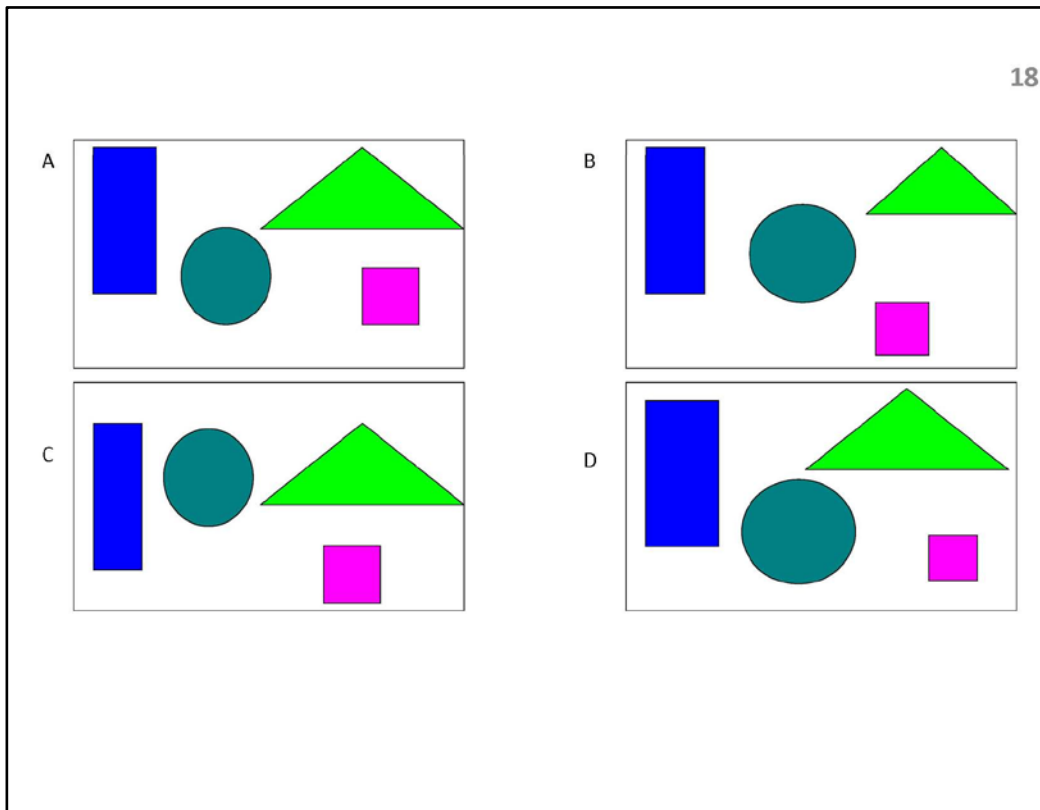


Figure 1: Sample stimulus slide from Experiments 1a - 1e showing the four quadrants of geometric shapes.

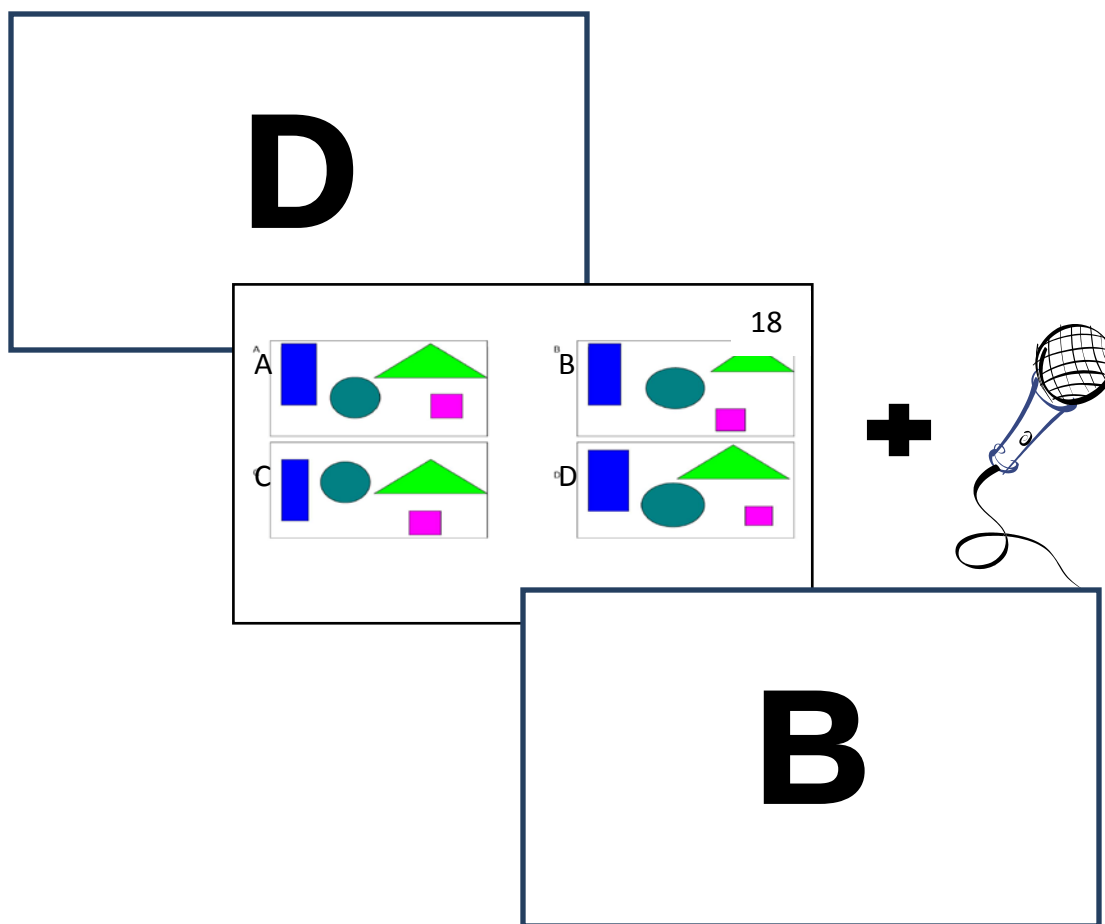


Figure 2: Schematic of one complete trial progression of Experiments 1a - 1d.

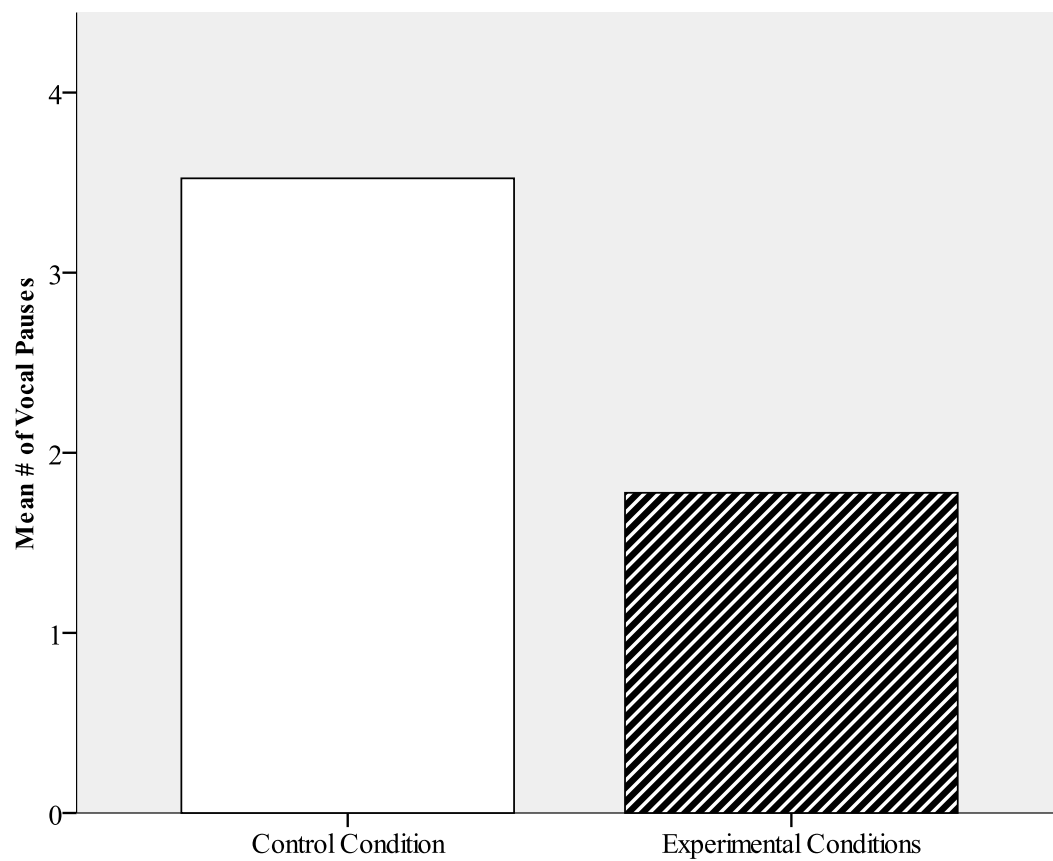


Figure 3: The average number of vocal pauses uttered during the control condition (no additional motivation) and the combined, experimental conditions (all with additional motives).

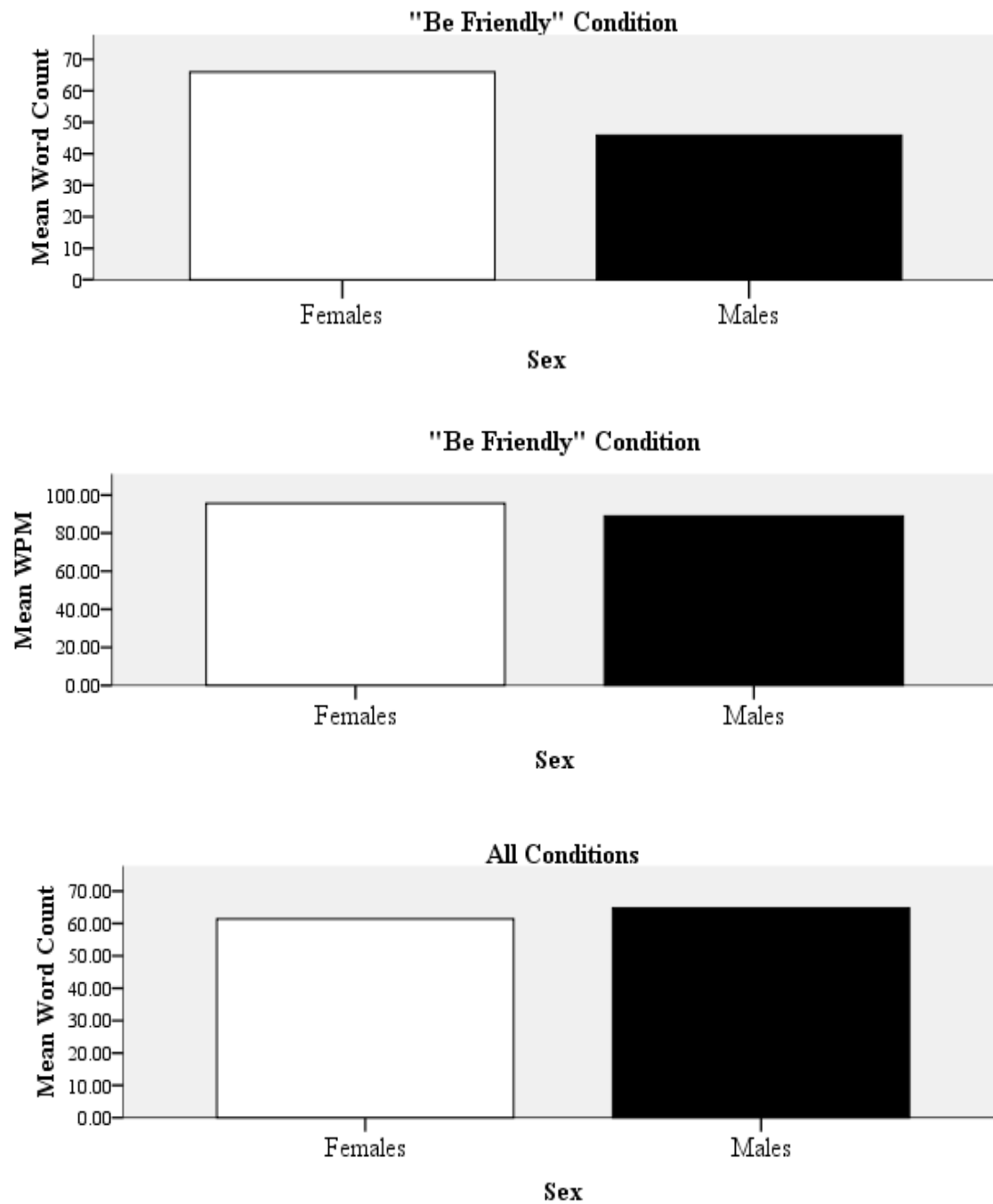


Figure 4: Mean word count and mean words per minute (WPM) for the Be Friendly condition by sex, and overall mean word count by sex.

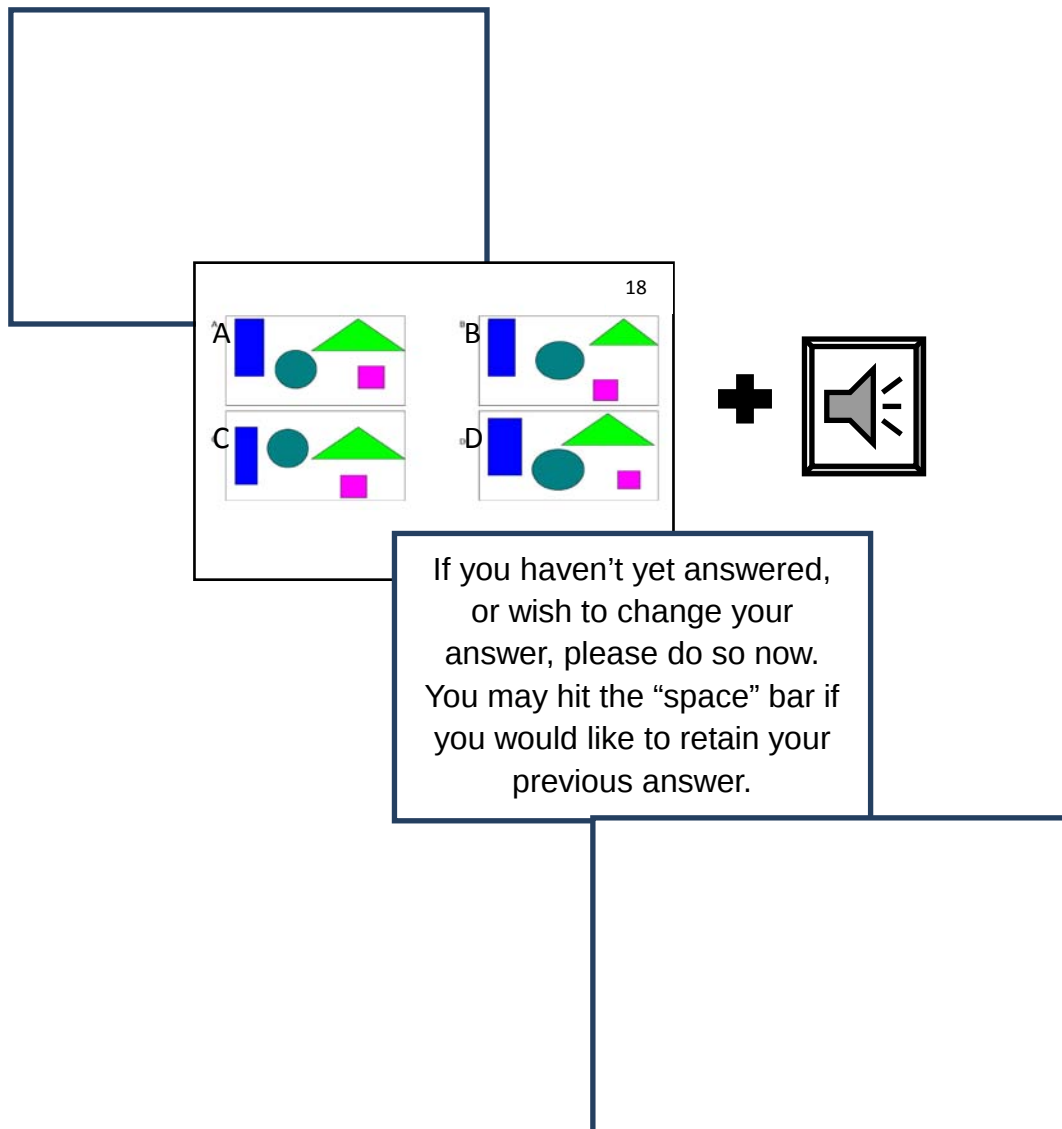
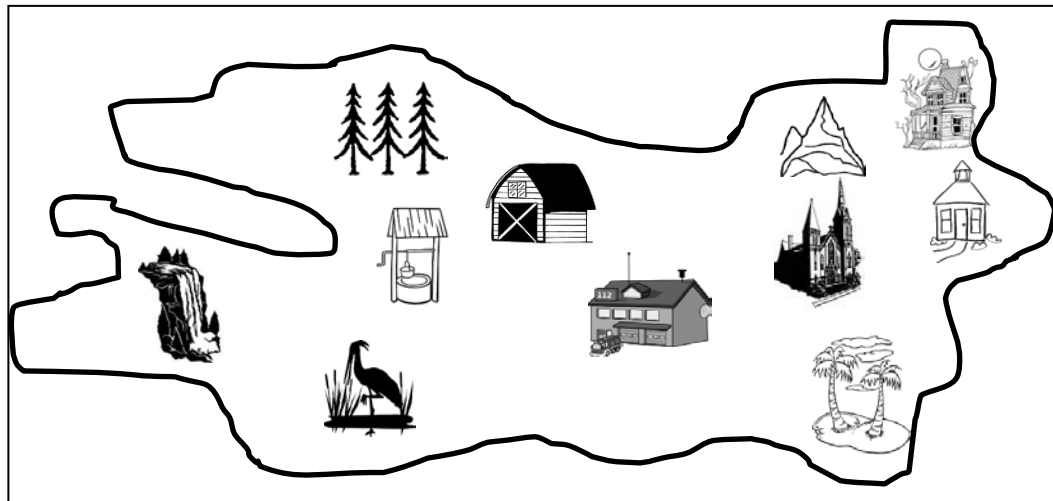


Figure 5: Schematic of one complete trial progression of Experiment 1e.



Blank Map A (to be recreated by Subject B, via Subject A's oral instructions)

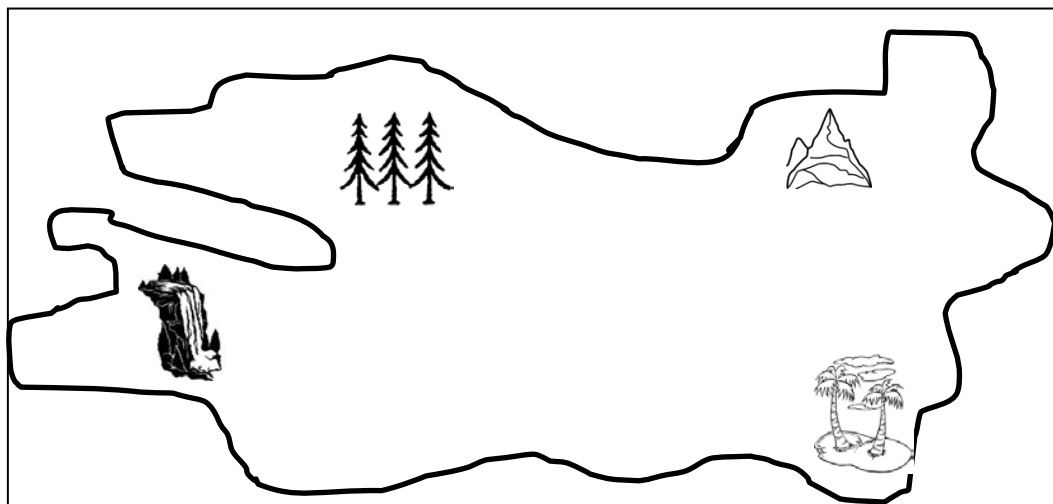


Figure 6: Examples of the original (complete) map and the blank (to be completed) map for Experiment 2a.

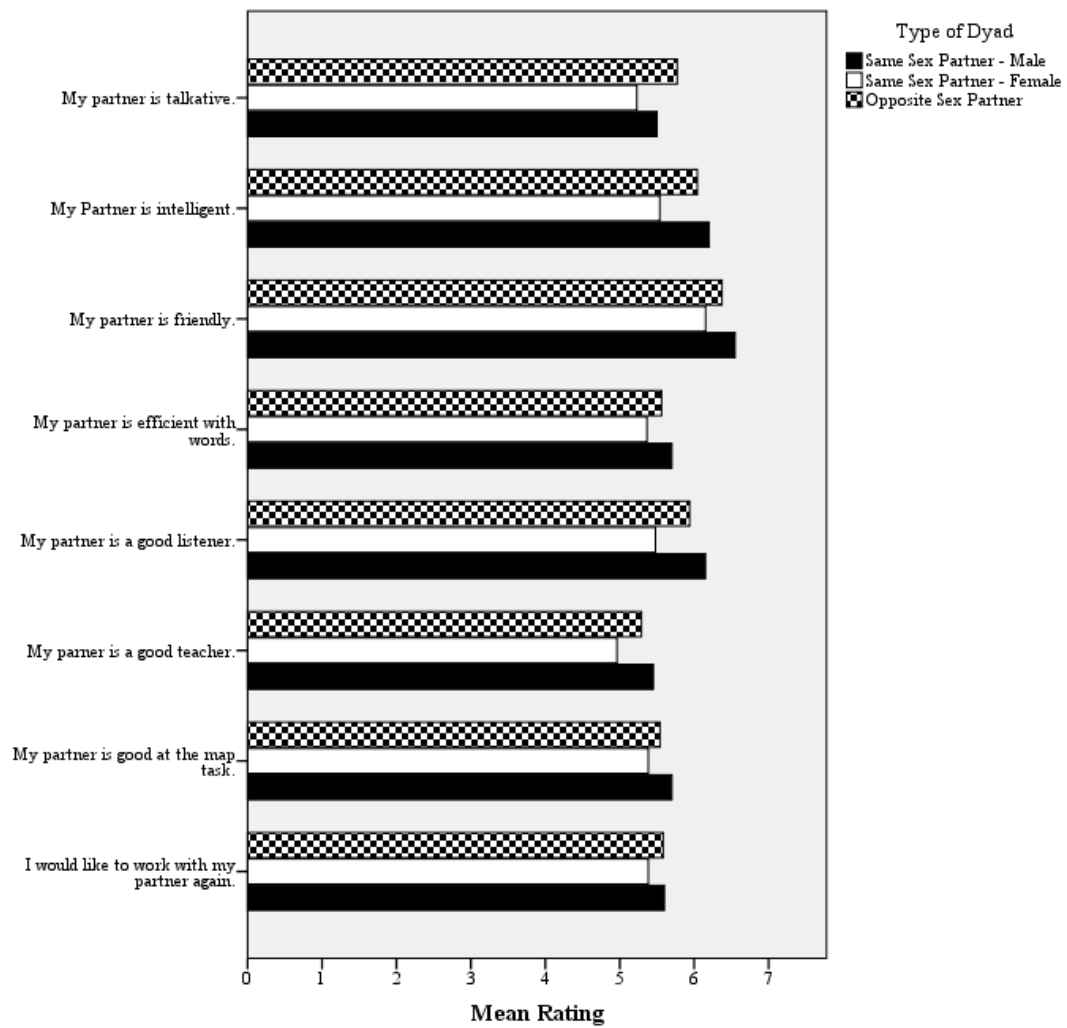


Figure 7: Mean ratings for each question on the partner evaluation questionnaire by dyad sex makeup.

Table 1: Means, standard deviations, and ANOVA results for all Experiment 1 talkativeness measures by condition.

Measure	Condition	N	Mean	Std. Deviation	F	<i>p</i>
Average Word Count With Vocal Pauses	No Add'l Motivation	42	70.27	31.94	2.98	.03
	Be Smart	57	66.91	38.41		
	Be Friendly	89	62.82	36.42		
	Be Efficient	79	53.19	29.21		
	Total	267	62.02	34.58		
MLU	No Add'l Motivation	42	43.98	19.13	1.71	.17
	Be Smart	57	42.33	19.22		
	Be Friendly	78	40.28	17.93		
	Be Efficient	77	36.94	16.59		
	Total	254	40.34	18.12		
Average Words per Minute	No Add'l Motivation	42	96.97	17.82	2.31	.08
	Be Smart	57	92.60	24.86		
	Be Friendly	78	94.46	23.93		
	Be Efficient	77	86.91	21.46		
	Total	254	92.17	22.69		
Average Number of Vocal Pauses	No Add'l Motivation	42	3.52	3.08	9.70	.000
	Be Smart	57	2.12	2.38		
	Be Friendly	89	1.54	1.54		
	Be Efficient	79	1.80	1.45		
	Total	267	2.05	2.12		

Table 2: Means, standard deviations, and ANOVA results for all Experiment 1 talkativeness measures by sex.

Measure	Sex	N	Mean	Std. Deviation	F	<i>p</i>
Average Word count With Vocal Pauses	Male	48	64.76	37.70	.37	.55
	Female	219	61.41	33.92		
	Total	267	62.02	34.58		
Average Clip length (which by necessity included vocal pauses)	Male	48	41.82	19.22	.40	.53
	Female	206	39.99	17.88		
	Total	254	40.34	18.12		
Average Words per Minute	Male	48	92.85	22.99	.05	.82
	Female	206	92.01	22.67		
	Total	254	92.17	22.69		

Table 3: Correlation coefficients for word counts (WC) on questions 1-3, and for questions 4-6.

Correlations					Correlations				
		WC_ Q1	WC_ Q2	WC_ Q3			WC_ Q4	WC_ Q5	WC_ Q6
WC_ Q1	Pearson Correlation	1	.022	.126	WC_ Q4	Pearson Correlation	1	.653**	.495**
	Sig. (2-tailed)		.872	.365		Sig. (2-tailed)		.000	.000
	N	57	54	54		N	60	58	58
WC_ Q2	Pearson Correlation	.022	1	.275*	WC_ Q5	Pearson Correlation	.653**	1	.496**
	Sig. (2-tailed)	.872		.042		Sig. (2-tailed)	.000		.000
	N	54	57	55		N	58	58	57
WC_ Q3	Pearson Correlation	.126	.275*	1	WC_ Q6	Pearson Correlation	.495**	.496**	1
	Sig. (2-tailed)	.365	.042			Sig. (2-tailed)	.000	.000	
	N	54	55	57		N	58	57	58

*. Correlation is significant at the 0.05 level (2-tailed).
 **. Correlation is significant at the 0.01 level (2-tailed).

Table 4: Correlations of the word counts during the question and answer (Q & A) session for all the words used, for the Q & A word count for on-topic speech only, and for the map task word count of all words, and impression ratings.

Correlations									
		Word count for the Q & A conversation.	On-Topic Word Count for the Q & A conversation	Word count for the map task	I would like to work with my partner again.	My partner is a good teacher .	My partner is a good listene r.	My partner enjoye d the map task.	My partner is talkative .
Word count for the Q & A conversation.	<i>r</i>	1	.970**	.246**	-.036	.181*	.131	.184*	.285**
	Sig. (2- tailed)		.000	.007	.693	.048	.153	.044	.002
	N	120	120	120	120	120	120	120	120
On-Topic Word Count for the Q & A conversation	<i>r</i>	.970**	1	.178	-.016	.160	.145	.199*	.292**
	Sig. (2- tailed)	.000		.052	.867	.080	.114	.030	.001
	N	120	120	120	120	120	120	120	120
Word count for the map task	<i>r</i>	.246**	.178	1	-.206*	-.036	-.152	-.070	.089
	Sig. (2- tailed)	.007	.052		.024	.696	.097	.447	.332
	N	120	120	120	120	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).