

Variations in Figurative Language Use as a Function of Mode of Communication

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Various studies have demonstrated that the mode by which people communicate affects the content of their messages. The present study examines the ways in which one aspect of language use, namely figurative language, differs as a function of mode of communication. Subjects worked together in pairs to build a small household appliance, with an "expert" directing a novice in the construction. Subjects communicated in one of four modes: full copresence, separated by a screen, through an intercom system, or through e-mail. Differences between modes were found on a number of measures of figurative language types, including what the author has described as "interrogative analogies". These differences are discussed in terms of costs, constraints, and affordances associated with different media, and the role figurative language plays in communication.

KEY WORDS: figurative language; communication mode; e-mail; on-line education.

INTRODUCTION

Since the inception of electronic communication, researchers in the social sciences have tracked the psychological impact on its users (i.e., Kiesler, Siegel, & McGuire, 1984). One facet of this is the way in which the unique communication environment of e-mail interactions affects the form and content of discourse framed within this medium. Numerous studies provide evidence that discourse is affected by the medium in which it is conducted. Findings reported by Chapanis, Ochsman, Parrish and Weeks (1972), Chapanis, Parrish, Ochsman, and Weeks (1977), Ochsman and Chapanis (1974), Stoll, Hoecker, Krueger, and Chapanis (1976), which predate the widespread use of e-mail, describe numerous ways that communication differs as a function of mode. They compared subjects' performance on two separate problem-solving tasks across four different

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communication modes: typewriting, handwriting, voice, and communication-rich. On various measures, these authors found effects for communication mode on linguistic output.

The most significant differences occurred in the amount of time required for completion, with the voice only and communication-rich modes requiring roughly half the time as the written modes (Chapanis *et al.*, 1972), despite the fact that a far greater number of words were used in the oral modes (Chapanis, *et al.*, 1977). In fact, Chapanis *et al.* cite numerous measures that point to the greater verbosity of oral relative to written communication. For example, on measures of number of messages, number of sentences, number of words, and number of words communicated per minute, the two oral modes had values that ranged from 6 to 19 times as great as corresponding values for the two hardcopy modes (Chapanis, *et al.*, 1977).

Working from the same data set, Stoll *et al.* (1976) note modal differences in the relative proportion of different classes of words. For example, subjects communicating in oral modes used more pronouns than did those in the hard-copy modes, and more function words (particles, prepositions, connectives and the like), which led the authors to remark that the written modes are characterized by a more telegraphic style and oral modes contain more redundant information. Despite this redundancy, the oral modes afforded solutions far more expediently.

A more detailed analysis of cross modal differences in linguistic structure comes from Cohen (1984). Cohen employed a task calling for an "expert" to direct a "novice" in the assembly of a pump. He compared subjects communicating in five different modes; face-to-face, by telephone, by keyboard (linked CRT's), audiotape (non-interactive) and written (non-interactive). Cohen was particularly interested in the act of referring, wherein the expert uses a noun phrase to signify a specific object that the novice can then identify, search for and find. The key finding was that the experts in the oral modes attempted to achieve more detailed referential goals than did those using keyboards. Specifically, those in the oral modes made far more use of identification requests than those using hard-copy modes. For example, an expert might state, "Do you see a part that is blue and round?", as opposed to simply stating "Pick up the blue round piece", and then wait for the novice to respond. The finding that this class of acts was far more common among telephone conversers than in communication through keyboard led Cohen to conclude that mode of communication does indeed have an effect on both the form and function of discourse.

Clark and Brennan (1991) account for discourse differences across contexts in terms of constraints and costs associated with various communication situations. They argue that different media afford different possibilities and, hence, patterns of communication will vary across media

to take advantage of these possibilities. As we move from one communication context to another, the rules for efficient communication change. What works in one mode may fail in another. Good communicators take these factors into account, and adjust the form and content of their message to reach understanding as efficiently as possible.

One such adjustment may be the production of figurative language. The purpose of the present study was to determine how different modes of communication may increase or decrease the frequency of figurative language. A wealth of evidence has established the ubiquity of non-literal language in a variety of speech contexts (e.g., Boerger & Henley, 1999, Columbus & Boerger, 2002, Johnson & Malgady, 1979; Pollio, Smith, & Pollio, 1990), as well as its role in structuring cognition (i.e., Lakoff & Johnson, 1980), attributable in part to the unique properties that figurative language affords. These properties may have differing value in different conversational contexts, and consequently, figures of speech may appear more or less frequently in different contexts, including different modes.

At this point, it may be of some value to provide an objective description of what is meant by a figurative expression. These are defined as references which attempt to draw attention to similarity between the object of reference and some other thing. Technically, figurative language is comprised of numerous categories. Barlow *et al.* (1971), for example, identify 14 different categories. For the purposes of this study, the majority of these types (i.e., categories like irony, onomatopoeia, etc.) are not considered to be particularly relevant. The decision to exclude these categories may appear somewhat arbitrary but the purpose of the study was to address the role of figurative language in a context involving explanation, and studies of this nature have generally focused on metaphor, analogy and simile as representative of figurative language. Thus, not all figures of speech were considered, but only those that fall within the categories of interest to this study; metaphors, analogies and similes. Guidelines for identifying these were those outlined by Barlow, Kerlin, and Pollio (1971) in their training manual for identifying figurative language, developed for the University of Tennessee Metaphor Research Group.

In describing metaphor and simile, Barlow *et al.* state that they "...function by making an explicit or implicit comparison or conjunction of two disparate ideas that share some common, though often highly imaginative feature (p. 4)". In metaphors, the comparison is implied, as in the expression "John is an elephant". In similes, the comparison is made explicit through the use of words such as "like", "as" and "as if". For example, "John eats *like* an elephant". For the current study, these differing forms of non-literal expression were collapsed into the single category of figurative speech, and constitute the dependent variables of interest.

One potential role of figurative speech is to provide more economical descriptions of objects or ideas than literal descriptions (Ortony, 1975). Figurative descriptions are often more economical than parallel literal descriptions in that they can make the same point or accomplish the same goal using fewer words. Glucksberg (1989) has made this point in his discussion of Krauss's studies of interpersonal communication (i.e., Krauss & Glucksberg, 1977; Krauss & Weinheimer, 1964). These studies all involve variations on an experimental task in which two people, separated by a screen and consequently not visible to each other, must communicate about a set of abstract, geometrical figures that do not have conventional names. This state of affairs challenges subjects to create their own descriptions for identification of the figures.

As Glucksberg notes, subjects in these tasks could employ two basic types of description, analytical (literal) descriptions or holistic (analogical) descriptions. Analytic descriptions are generally lengthier, involving detailed collections of parts, whereas analogical descriptions compare the figure to a known object and refer to it as a whole. Glucksberg reports that in the Krauss studies, subjects overwhelmingly preferred analogical to literal descriptions, due to the greater efficiency and precision they afforded their users.

Krauss and Fussell (1991) make a similar claim. In one study (Fussell & Krauss, 1989), figurative and literal descriptions were compared on the measure of mean description length based on average number of words. Literal descriptions average about 20 words per description, compared to less than 10 words per description for figurative descriptions. Clark and Wilkes-Gibbs (1986) found a similar pattern in a study that they conducted at Stanford employing a communication task modeled after Krauss's. In this study, subjects showed a preference for analogical descriptions over literal ones. In attempting to account for this preference, the authors note that analogical, or holistic, descriptions involve but one concept. Literal (segmental) descriptions on the other hand, may involve many concepts and consequently require somewhat lengthier descriptions. Therefore, it requires fewer steps to reach agreement when analogical descriptions are used.

Another role commonly ascribed to figurative language is its ability to produce imagery in the mind of its audience more effectively and more vividly than literal counterparts (e.g., Johnson & Malgady, 1979). Ortony (1975) argues that metaphor is closer to perceived experience than literal language. Ideas conveyed figuratively achieve a greater richness and vividness of detail, further enabling the construction of mental images. To summarize, figurative descriptions are an effective means of enabling a listener to imagine a target object or concept, and an economical means given their brevity relative to literal descriptions.

Given the assumption that figurative language plays an important role in efficacious communication, it is of interest to ascertain its prevalence in what is an emerging channel of intercourse, i.e., e-mail, relative to more traditional forms of intercourse such as oral and face to face conversation and to identify differences in the factors giving rise to the appearance of figures across modes. Consider, for example, a situation in which one person is instructing another in the completion of some task, such as assembling a household item. The standard mode in which this is typically conducted is in face-to-face communication, with both participants sharing the same perceptual environment. Current trends may dictate that people are called upon more often to perform this class of task through alternative media, such as e-mail. As an example, witness the rise of online education. How might their performance of these tasks in these alternative media vary from the 'base mode' of face-to-face communication? Given the assumption that different media have different affordances and constraints associated with them and require different strategies and goals of people using them, it was hypothesized that the relative frequency of figurative descriptions in e-mail and voice only modes would differ significantly from the 'base mode'. Previous studies have indicated that across a wide range of measures, people are far more verbose when communicating orally than when engaged in written communication. Thus, it was hypothesized that this same trend would apply to the frequency of figurative expressions of various kinds as well. Given issues of economy as they pertain to e-mail (see Clark and Brennan, 1991), it was further assumed that relative frequency rates, as opposed to raw frequency counts, may actually be greater in the e-mail mode. It was also hypothesized that the frequency of a type of figurative description that I have referred to previously as interrogative analogies (Boerger & Henley, 1999) would be affected by mode of communication. Such figures are ones that are used by people receiving instruction, and are framed as questions asked to clarify misunderstanding. Since some modes of communication provide more opportunities for asking questions than others (i.e., more opportunities of this kind in oral communication than in e-mail communication), it was assumed that frequencies of interrogative figures would be subject to modal effects, with greater frequencies appearing in the oral modes.

METHOD

Subjects

The subjects of this study were 160 undergraduate students from the University of Tennessee, Knoxville. Volunteers were recruited from upper

level psychology courses. All participants received extra credit in these courses in exchange for taking part in the experiment. Subjects worked in pairs, with one assigned the role of expert (director) and the other that of novice (builder). This yielded a total of 80 pairs, with 20 pairs in each of four conditions representing four modes of communication.

Apparatus

Modes

The pairs communicated in one of four modes; full co-presence (both subjects were in the same room, in full view of one another), face-to-face co-presence (both subjects were in the same room but separated by an opaque screen, with only eye contact possible), voice only (subjects were housed in separate rooms and communicated using an intercom system), and e-mail communication (subjects were housed in separate rooms and communicated using interactive e-mail). The intercom system used in the voice only condition was a two-way radio system. With this device, only one participant can speak at a time. This allowed for interactive exchanges, but not simultaneity of speech. Subjects in this condition were housed in separate rooms, approximately 30 feet apart.

Subjects in the e-mail communication condition used an interactive form of e-mail known as "talk", in which typed messages appear simultaneously on a split screen. Subjects in this condition occupied rooms approximately 30 feet apart, equipped with computer keyboards and monitors.

The voice only and face-to-face co-presence conversations were recorded by placing a tape recorder in the room with the director, which allowed both conversants to be taped. Face to face interactions were videotaped. Printouts of the e-mail interactions provided hard copy transcripts of conversations in that condition.

Experimental Task

The equipment assembly problem required the two partners to work together to build a hibachi grill, a common household item requiring some assembly. The hibachi is complicated enough a design that it would be difficult to build without directions but can be successfully assembled in a reasonably short time with directions. The set of instructions given to each director is a set of step-by-step illustrations of parts and assembly, along with a list of contents, provided by the manufacturer. The only tool required to build the grill is a standard screwdriver.

Procedure

Experts were required to attend two sessions, scheduled on consecutive days. In the first session, the expert was given a brief training session on how to build the hibachi grill. Experts were provided with illustrated directions, the actual parts, and tools. They were allowed to assemble, disassemble and reassemble the device a suitable number of times until they felt they had mastered the procedure sufficiently and were confident that they could explain the procedure to another person. This session was monitored by the experimenter, who answered subjects' questions and checked their work for errors, but did not otherwise verbally instruct them. When subjects felt confident in their mastery of the task, they told the experimenter how to assemble the grill in order to demonstrate expertise.

In the second session, each "expert" was paired with a "novice" partner. Experts and novices were recruited from different classes, and in the majority of cases were not known to each other. Each partner was briefed regarding the nature of his/her job role. Both partners were informed that they could talk freely, with no constraints placed on their conversation. Experts in the face-to-face condition were given only one restriction, that they not physically handle the parts at any time. Participants were told to take as much time as they needed to work on the problem, and were asked to work the problem through to completion. They were given the following instructions:

For directors;

You are to work with your partner to build a simple device. You have been provided with the directions for assembly, and been trained in the assembly of this device. You will now be asked to provide your partner with instruction while s/he builds it. Your partner has all the required parts and tools, but no directions. You may use the set of directions you have been given as a guideline, but do not simply read them verbatim in your instruction. You may say anything you want in order to get the job done. You may ask your partner questions, and answer your partner's questions freely. Take as much time as you need, but please work the problem through to completion.

For the builder;

You are to work with your partner to build a simple device. Your partner has the directions for assembly, while you have all the required parts. All the tools you will need are here for you. You may ask your partner any question you want at any time. Take

as much time as you need, but please work the problem through to completion.

The directors had the required parts handy (except in the full copresence condition), as well as a copy of the instructions for reference, so they could work through the problem with the builder while instructing. The builder had only the parts and tools for assembly. In addition, both subjects were given instructions relating to the use of the various media for communication (i.e., how to use the intercom or keyboards, etc.).

Dependent Variables

Within the broader category of figurative language, as defined earlier, some other distinctions were made, producing additional categories of dependent variables. A description of these follows.

Interrogative Figures

In a previous paper (Boerger & Henley, 1999), I noted that in contexts we are considering, the person receiving instruction asks questions framed as analogies. For example, when the instructor refers to something unfamiliar to the instructee, that person may, in the course of attempting to establish mutual ground, inquire of the instructor, "Is it like ...?", or "Does it look like...?". These figures, (i.e., those used by the instructee and framed as questions), were labeled as interrogative analogies.

Unique Figures

Unique figures, in the present study, will be understood to mean figures that are unique only in terms of their use in the current context. That is to say, the first appearance of a particular figure will be scored as a unique figure. Subsequent uses of the same figure will not. Each new figure that appears in a particular protocol is scored as a unique figure (i.e., unique to that speaker). Thus, we may have two protocols that have the same or similar total number of figures used but different number of unique figures used (if, for instance, one of the protocols includes several uses of the same figure to refer to the same object at different times, and the other includes different figures used to describe different objects, or different figurative descriptions of the same object).

Selection of Figures

Decisions concerning the identification and scoring of figurative descriptions were made by two independent raters. Their selections were

made on the basis of a procedure originally developed by Barlow *et al.* (1971) for identifying figurative expressions in written transcripts. Each rater underwent a brief training session using Barlow *et al.*'s procedure for identifying figurative language of the type of interest in this study (as previously mentioned, several categories of figurative language identified by Barlow *et al.* were excluded from the present study). Upon completing their training, raters independently reviewed copies of the transcripts, circling any expressions that they identified as being figurative, based on established criteria. The principal investigator compared the transcripts of the judges, and only those expressions selected by both judges were included in the final count. To assess inter-rater agreement, a Cohen's Kappa was performed on the judges' ratings, and a score of .70 was obtained. This score reflects a moderate level of agreement between raters, though ideally, a higher level of inter-rater agreement would have been obtained.

RESULTS

Frequency of Figurative Language

To demonstrate that the frequency of figurative expressions (across all categories) varied as a function of mode of communication, mean values were computed for all conditions. Although an Analysis of Variance found significant differences between modes for the frequency of figures used ($F(3, 156) = 13.32; p < .001$), simply looking at overall frequencies does not provide the most powerful assessment of differences, given the fact that oral modes are, as a rule, more verbose than other modes. A more meaningful measure would be the relative frequency of figures used. If figures of speech account for a greater or approximately equal percentage of the overall word count in the written mode than in the other modes, this would say something interesting about the relative importance and utility of figures in this medium. For this reason, it was decided that rather than comparing raw frequencies, it would be more useful to look at differences in frequency rates. The rate chosen was number of figures per 100 words spoken.

An Analysis of Variance was used to test the hypothesis that relative frequency would differ significantly across modes, and the results of this test confirm the hypothesis that the various modes differ significantly from one another ($F(3, 156) = 10.42; p < .001$). An examination of the means in the four conditions would seem to suggest that the difference is primarily accounted for by the low relative frequency of figures in the

Table I. Dependent variable = Rate of figurative expressions

Mode	Conditions differing from	Means	Standard deviations
1. Intercom	4	2.99	1.25
2. Face to face	4	3.17	1.19
3. Written	4	3.20	1.98
4. Full copresence	1, 2, 3	1.54	1.7

Source	Sum of squares	ANOVA df	Mean square	F	Probability
Between groups	76.28	3	25.428	10.42	.000
Within groups	380.55	156	2.44		

full copresence mode. A Tukey test found the only significant difference was between the full copresence mode and each of the other three modes; differences among all remaining three modes are slight (Table I).

Interrogative Figures

As indicated earlier, interrogative figures refer to figures produced by the novice and posed as questions, used in an attempt to establish agreement or clarify misunderstanding. Some examples follow:

From face to face interaction:
Expert: Okay, then you take two things.... I don't know what they are called.
Novice: Look kinda like stars?
Expert: Yeah.

From Voice Only interaction:
Expert: Ok. You want to attach...they're two large metal grates. They're silver, you know what I mean?
Novice: What do they look like?
Expert: They are approximately... oh, shucks, they're 7 inches by 10 inches in diameter.
Novice: Like an oven rack?
Expert: Yeah, right.

From written interaction:
Expert: O.K. find the wood handle plates... silver
Novice: Four L-shaped things?
Expert: yes

An Analysis of Variance found significant differences between the four modes for frequency of interrogative analogies ($F(3, 78) = 12.293$; $p < .001$) (Table II). In addition, rates of interrogative frequency per 100 words

Table II. Dependent variable = Interrogative analogies

Mode	Conditions differing from	Means	Standard deviations
1. Intercom	2, 4	2.1	1.68
2. Face to face	3, 4	4.25	3.86
3. Written	2	1.15	1.31
4. Full copresence	1, 2	0.15	0.67

Source	Sum of squares	ANOVA			Probability
		df	Mean square	<i>F</i>	
Between groups	183.74	3	61.25	12.29	.000
Within groups	378.65	156	4.98		

Table III. Dependent variable = Rate of interrogative analogies

Mode	Conditions differing from	Means	Standard deviations
1. Intercom	4	.71	.51
2. Face to face	4	.83	.54
3. Written	4	.68	.79
4. Full copresence	1, 2, 3	.03	.12

Source	Sum of squares	ANOVA			Probability
		df	Mean square	<i>F</i>	
Between groups	7.836	3	2.612	8.75	.000
Within groups	22.68	156	0.30		

were calculated and compared (see Table III). An ANOVA for frequency rates of interrogative analogies also found significant differences among conditions ($F(3, 78) = 8.28$; $p < .001$). Once again, Tukey tests established that the only truly significant inter-modal differences were those between the full copresence mode and the other three modes.

Unique Figures

In looking at use of figures in individual transcripts, it was generally the case that once a given figure was introduced by either the builder or director, it was used repeatedly throughout the conversation to make subsequent reference to the same part.

For example (from the intercom mode):

E: Okay, now you need to find, there should be a small little metal piece with kind of, it looks like a belt buckle. There should be a metal piece that looks like a belt buckle.

N: Right.

At a later point in the same conversation, the expert refers back to this expression.

E: Okay, so what you need to do is you need to put the little metal piece inside the belt buckle.

The fact that repeated uses of the same figure accounted for a great deal of the frequency of figures produced led to the introduction of another category for analysis, which I will refer to as unique figures. By unique, I mean unique to a specific protocol, not to all protocols. Thus, the first time a figure is used by either subject in a given protocol, it is labeled as a unique figure, with subsequent uses of the same figure in the same conversation not so labeled. In other words, unique figures refer to the number of different figures used by both subjects in a given protocol. This provides an index of the variety of figures used, as opposed to simply the number of figurative expressions produced. An ANOVA indicated that the number of unique figures generated by subjects varied as a function of mode of communication ($F = 4.29, p < .01$). The greatest variety of figures occurred in the intercom and face to face copresence modes (intercom, $\chi = 3.58, sd = 3.52$; face to face copresence, $\chi = 3.83, sd = 3.55$). The least variety of figures, as expected, was found among those communicating in the full copresence mode ($\chi = 1.65, sd = 2.14$). While the mean number of unique figures in the e-mail mode was slightly less than that for the intercom and face to face modes ($\chi = 2.58$), it did not differ significantly from these modes (see Table IV).

Context of Appearance

As reported in a previous paper (Boerger & Henley, 1999), figurative descriptions can arise in a number of different ways. They may represent

Table IV. Dependent variable = Unique Figures

Mode	Conditions differing from	Means	Standard deviations		
1. Intercom	4	3.58	3.52		
2. Face to face	4	3.82	3.55		
3. Written	—	2.58	2.73		
4. Full copresence	1, 2	1.65	2.14		
ANOVA					
Source	Sum of squares	df	Mean square	<i>F</i>	Probability
Between groups	119.17	3	39.72	4.29	.006
Within groups	1444.43	156	9.26		

the first description offered of a thing, as in the following example from the face to face copresence mode:

E: ...OK, now you're going to put on your ladder looking things.

Alternatively, they may represent a supplemental description offered as an addendum to a more literal description (to be referred to here as supplemental figures), as in the following example from the intercom mode E: Okay, take the adjustable draft control plate. It's a little silver thing that has two places for screws on the ends...it looks like a picture frame.

Finally, figurative descriptions may arise when the expert has tried a literal description that is not fully understood by the novice, and then offers an alternative, figurative description in response to that uncertainty (to be referred to here as response figures), as in the following example from the face to face copresence mode:

E: ...there's a little silver piece that fits into it.

N: There's a silver piece?

E: Yeah, silver piece that's a little door that slides.

N: OK. I got it.

It was assumed that the two latter types would appear more frequently in the oral modes than in the e-mail and full copresence modes. An ANOVA did show an effect for mode on figurative descriptions of this type (supplemental figures, $F = 5.85$, $p < .001$; response figures, $F = 4.174$, $p < .01$) consistent with the hypothesized relation.

DISCUSSION

The current study offers considerable evidence demonstrating modal effects on the frequency and context of figurative expression. Significant differences between modes on a number of linguistic measures were found, consistent with findings reported by other authors (i.e., Chapanis *et al.*, 1972, 1977; Cohen, 1984). In contrast to the aforementioned studies, however, the greatest source of variance seems to be the difference between the full co-presence mode and those providing lesser degrees of co-presence rather than between written and oral modes. This suggests that the lack of a shared visual field is a primary reason people use figurative descriptions. The primary differences between modes in frequency of figurative descriptions are accounted for by their low rate of occurrence in the full copresence mode. Direct observation of subjects communicating in this mode offers some insight into the reasons for this effect. The fact that subjects in this group were in full view of each other, and of each other's visual field, made the use of descriptions of any kind largely unnecessary. Rather

than describing objects, either figuratively or literally, subjects could simply point to, or nod at the object, which in fact they did the majority of the time. Having a shared perceptual field eliminated the need to use verbal feedback as a means of monitoring progress, and identifying and correcting mistakes. Such concerns were directly present to the expert. These factors were the most important reasons for the overall lack of verbosity in the full copresence condition and for the low rate of figurative usage, across all categories of figures, in this mode.

The difference between the full copresence mode and the other modes cited above points to one niche filled by figurative descriptions in the other modes. In conversations that do not afford the expert opportunities to guide the perceptions and actions of the novice with nonverbal behaviors, metaphors and similes seemed to serve as a linguistic analog for these behaviors and help their user achieve the same goals. Verbrugge (1985) notes this role of metaphor in a paper addressing the relationship between language and direct perception. As Verbrugge states "The relations between metaphoric language and event perception can be considered in three contexts (which are admittedly only partially separable): the role of metaphor in guiding "virtual experience", its role in preparing a person for direct perception, and its role in preparing a person for coordinated movement (action)" (p. 167). The first of these contexts refers to dreams and related experiences and is not relevant here. The other contexts relate to the experience of an expert attempting to instruct a novice in the performance of an activity or the acquisition of a new skill. According to Verbrugge, metaphors and similes facilitate this process by accessing an existing schema for the novice, elements of which may be transferred to the current context.

The role of metaphor as a means of preparing a person for direct perception was the role most often encountered in the present study. By describing a piece as looking like something that the novice was familiar with, experts were directing the perceptual activity of the novice toward finding an unfamiliar part from among the array of available parts. The related role of directing the motor activity of novices, while less prevalent, was found as well. The following example is illustrative of this function.

Expert: "You should have it where it's kind of like a tray, like a lunch tray like you get over in 'Rafter's '. You should have it sitting in your lap like that."

Yet another example, where two parts were referred to at an earlier point in the conversation as looking like soccer goals, and now the novice has made a query about what her orientation to these parts should be.

Expert: "If you're gonna kick a goal, like as if you're running to the goal".

In both examples, the expert is accessing a sensorimotor schema to guide the novice's motor activity with the use of a metaphor or simile.

Among the three modes other than full copresence, it is interesting to note that the highest rate of figures used occurred in the e-mail mode. The reasons for this trend may be related to the issue of economy. Clark and Brennan (1991), in comparing e-mail communication and telephone conversation, argue that e-mail communicators try to accomplish as much as telephone conversants while saying less. This argument is framed within their notion of costs associated with different media. It takes more effort, and thus "costs" more, to produce words when typewriting than speaking.

E-mail communicators are able to be more selective in their use of words by virtue of the fact that they can deliberate more on the content of their message before actually producing it than can telephone conversants. As Clark and Brennan note, the cost of delaying a message is greater in telephone conversation than in e-mail communication. In addition, those communicating by e-mail may revise their message before sending it, something that telephone conversants are less able to do. Taken together, these factors allow e-mail communicators to better economize while framing their message.

The need for greater economy endemic to e-mail communication translates into a greater reliance on figurative descriptions. As Ortony (1975) notes, figurative descriptions are more economical than corresponding literal descriptions because metaphor "...enables language comprehension to take place without the need for the message to explicitly spell out all the details" (p. 47). Fewer details translate into less wordy descriptions. Consequently, it makes sense that the medium in which the need to minimize word production is greatest would be the medium in which the highest rate of figurative usage occurs.

As predicted at the outset, frequency of interrogative figures also varied as a function of medium. The low frequency of interrogative figures in the full copresence mode was largely attributable to the factors mentioned previously. That is, the function they served was accomplished by pointing and other nonverbal means available to novices in that condition. Of the remaining modes, subjects in the e-mail condition used the fewest interrogative figures. This trend is probably due to the costs associated with interrupting and asking questions in e-mail relative to oral conversation. Clark and Brennan (1991) suggest that the cost of changing speakers is greater in e-mail and other written modes than in oral conversation. Consequently, novices in this mode show greater conservatism about interrupting with a question of any kind, including those framed as figures, than novices in oral modes.

The lower frequency of interrogative figures in the e-mail mode is also consistent with a pattern discovered by Cohen (1984). In Cohen's study, experts instructing over the telephone were more likely than those communicating with keyboards to produce what he termed identification requests, where the novice is asked to identify if they see or have a certain part handy. For example, asking a subject, "Do you see a small tube?" as opposed to instructing her to "Pick up the small tube". Identification requests seem more likely to elicit a response of some kind, including interrogative figures, thus favoring a higher frequency of such figures in the voice only and face to face copresence modes.

The prediction that mode of communication would affect the context of appearance for figurative descriptions was supported. The reasons behind these differences are what one might expect working from the model provided by Clark and Brennan (1991). Figurative expressions that arise as add-ons to a literal description, or as alternatives to a previously offered literal description, may in some sense be considered repairs or self-corrections by the expert. As such, their higher frequency of occurrence in the oral modes than in the written mode is consistent with Clark and Brennan's theoretical model. As these authors note, the cost of making repairs is higher in written communication than in audible conversation. Also, as previously mentioned, written communication affords its users more opportunities to revise messages before sending them, thus minimizing the need to institute repairs.

The higher frequency of unique figures encountered in the oral modes is consistent with findings in previous studies such as those done by Chapanis *et al.* (1972, 1977). These authors found that subjects communicating in oral modes produced a greater number of unique words than did those in written modes. In addition to simply reflecting greater diversity in oral versus written speech, other factors may have contributed to the differences in unique figures. First, it is possible that they reflect the greater frequency of questions asked by novices in the oral conditions. More questions may have been interpreted by the experts as a request to provide alternative descriptions, such as another figurative description. Additionally, experts in the oral modes may not have remembered how they originally referred to a part, and consequently may call it something different at a subsequent point in the conversation. Experts in the written mode had the advantage of having a record of earlier communication displayed on the computer screen, which they could refer back to, thus contributing to less diversity in their descriptions. Ultimately, this lack of diversity may be yet another example of the impact of economy in the written mode.

CONCLUSION

Given the trend toward more collaborative work being done online, as well as more online education and distance learning opportunities being available, it is important to understand the consequences of the shift away from face to face communication. Some of the opportunities available in face to face interactions do not occur in alternative communication environments. However, the generativity of language provides suitable alternatives that compensate for this lack, allowing for successful collaboration in these degraded conditions. Figurative language is one such alternative. In light of this, some observations drawn from the present study are worth noting.

People do use figurative language frequently in conversation, and they seem to do so because figurative language provides an efficient and effective tool for communicating about unfamiliar topics. It affords its users the possibility of constructing a perceptual schema to guide its recipients when the context of communication does not afford a shared perceptual environment, as is the case in distance learning. In such contexts, it helps communicators coordinate their understanding and their actions toward the accomplishment of a shared goal.

Figurative language, like other aspects of language, is affected by the context, in this case the medium of communication. The rules for effective communication are dictated largely by the conditions in which that communication occurs. People are sensitive to these factors and adjust their speech accordingly. Consequently, figurative expressions, be they framed as descriptions or interrogatives, are used differently in different situations, to maximize their utility.

In addition to emphasizing the differences between media, it is also worth making note of the similarities in usage across media. Contexts such as communicating through intercom (or, for that matter, by telephone) and communicating by e-mail, differ in that one involves oral communication and one involves written communication, but share the common factor of a separation of the communicating parties. The fact that subjects in both conditions produce similar rates of figurative expressions, if not similar frequencies, speaks to the efficacy of figurative language across contexts in bridging the gap brought about by separation. In essence this result would seem to support the claim made at an earlier point, that figurative language provides a useful tool for building a common ground among communicators.

Those interested in online collaboration, or distance learning, might do well to take these observations into account when framing their messages. Incorporating figurative descriptions into explanations enhances the

effectiveness of the effort. Conversely, a student framing questions in the form of an analogy may help give the instructor a better sense of where the student is regarding their understanding. It is important for educators to recognize that figurative language, already shown to be valuable in traditional educational settings, may prove even more valuable in alternative educational settings.

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