SOME COGNITIVE CONSEQUENCES OF COMMUNICATION

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Although psychologists agree that people use language to categorize and describe their experience, there is considerably less agreement on whether the language people use also affects the way they come to know and represent that experience. Study of the relation of language and cognition has had a long and somewhat checkered history in psychology (Brown, 1976; Glucksberg, 1988; Hunt & Agnoli, 1991). Perhaps the most controversial view is incorporated in what has come to be known as the linguistic relativity, or Sapir-Whorf, hypothesis, which holds that the grammatical structures of markedly different languages cause their speakers to experience and mentally represent the world in markedly different ways. As Whorf put it:

> The world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds -- and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way -- an agreement that hold throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, but its terms are absolutely obligatory; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees (Whorf, 1956, pp.213-214).

The Sapir-Whorf hypothesis has generated a substantial body of empirical research in color memory (e.g., Brown & Lenneberg, 1954; Kay & Kempton, 1984; Heider, 1972; Heider & Olivier, 1972; Lantz & Stefflre, 1964; Lucy & Shweder, 1979, 1988), categorization (e.g., Carroll & Casagrande, 1958), person perception (e.g., Hoffman, Lau, & Johnson, 1986; Lau & Hoffman, in press), and counterfactual reasoning (e.g., Au, 1983, 1984; Bloom, 1981). However, despite psychologists' early enthusiasm for the hypothesis, recent reviews of the

empirical literature (Brown, 1976; Glucksberg, 1988; Pinker, 1993; Rosch, 1987) find little support for it. Pinker finds "no scientific evidence that languages dramatically shape their speakers' ways of thinking" (Pinker, 1993, p. 12). The lack of unequivocal empirical evidence, coupled with a shift within linguistics from an emphasis on linguistic diversity to an overriding concern with language universals, has contributed to the waning of interest in the Sapir-Whorf hypothesis. Many cognitive scientists now appear to favor the view that mental representations are independent of their linguistic instantiations. For example, Chomsky (1992) argues that "The computational system of language that determines the forms and relations of linguistic expressions may indeed be invariant; in this sense, there is only one human language, as a rational Martian observing humans would have assumed" (p. 50). Pursuing a similar theme, Pinker concludes that "a visiting Martian scientist would surely conclude that aside from their mutually unintelligible vocabularies, Earthlings speak a single language" (p. 232).

Rejection of the Sapir-Whorf hypothesis has been interpreted by some as support for the proposition that language has no cognitive consequences. In part, this may result from a semantic confusion. The word *language* has both a generic sense (as in "*Language* permits humans to communicate with a degree of flexibility that is unmatched by other species") and a specific sense (as in "Hopi and English are two *languages* with markedly different grammars"). The two senses are related, but they are not synonymous. The Sapir-Whorf hypothesis is concerned with the second sense, and the balance of the evidence seems to support the conclusion that speakers of structurally different language do not represent their experience in markedly different ways. However, even if structural differences among languages do not affect cognition, language (in its generic sense) could still have important cognitive consequences.

In this chapter we describe an alternative approach to conceptualizing the relation of language and cognition that derives from a consideration of language

use in communication. There is considerable evidence that *using* language can affect a variety of cognitive processes. For instance, habitual ways of reading in a language can influence preferences in directional scanning (Braine, 1968; Chen & Chen, 1988; Hoosain, 1991; Kugelmass & Lieblich, 1970); phonological properties of language used to rehearse stimulus materials can affect performance on verbal memory (Ellis & Hennelly, 1989; Hoosain & Salili, 1987; Neveh-Benjamin & Ayres, 1986); labeling of visual stimuli can affect memory of their visual form (Carmichael, Hogan & Walter, 1982; Daniel, 1972); verbal framing of a decision problem can affect the way the problem is represented and subsequent decision-making (Kahneman & Tversky, 1984; Levin, Schnittjer & Thee, 1988; Northcraft & Neale, 1986); and the way a problem is presented verbally can affect performance on problem-solving tasks (Glucksberg & Weisberg, 1963). What is distinctive about these cognitive effects is that all involve the *use* of language in mental operations.

Our proposal is that describing or referring to a state of affairs can create or activate a corresponding verbal representation (Paivio, 1986), which conflicts with other representations in memory. As a result, when the state of affairs is later recalled, its representation in memory may be affected by information contained in the description (e.g., Fallshore & Schooler, in press; Schooler & Engstler-Schooler, 1990). One implication of this view is that, since extralinguistic contextual factors can affect how a state of affairs will be characterized in communication, the same factors can also influence subsequent mental representations of that state of affairs (Chiu, Krauss, Lam & Tong, in press). In the next two sections, we will review evidence bearing on this proposal.

Cognitive Effects of Language Use

The Verbal Overshadowing Effect

It is well-established that articulating or comprehending an utterance can result in at least three different (though related) mental representations. They are: (a) *The surface form*: A superficial representation of the utterance's syntactic,

semantic and pragmatic properties, (b) *The propositional text base*: A representation of the utterance's meaning in the form of an interconnected network of ideas; and (c) *The situation model*: A representation of how the speaker experiences the situation described in the utterance (van Dijk & Kintsch, 1983). For example, *We elected a new mayor* and *A new mayor was elected* have the same propositional representation but different surface forms. The situational representation of *The incumbent mayor lost his seat* is different from those of the previous two sentences, although their propositional representations may be similar. There is good evidence that memory for the surface form tends to be most short-lived, while memory for the situation model tends to be most enduring (see Fletcher, 1994).

Because the situational experience of many stimuli described in an utterance could be easily represented in a network of propositions, describing such stimuli may evoke a propositional representation that is similar to the situational representation the description has created. Moreover, for a stimulus that is readily describable, the resulting propositional and situational representation may be similar to other nonverbal representations of that stimulus. Under such circumstances, verbalization of visual stimuli can enhance memory for them (Ellis and Daniel, 1971; Klatzky, Martin, & Kane, 1982; Paivio, 1986).

By the same mechanism, verbalization can *reduce* the accuracy of visual memory for stimuli that are difficult to characterize verbally. For example, Schooler and Engstler-Schooler (1990) found that describing a target person's face not only failed to enhance participants' memory for the face, it actually resulted in non-transient memory impairments. To explain this result, Schooler and Engstler-Schooler propose that using language to describe, characterize or label a state of affairs will create or activate verbal representations of that state of affairs. Later, when the state of affairs is retrieved from memory, such verbal representations may compete with or "overshadow" other nonverbal

representations in memory. According to this *verbal overshadowing hypothesis,* "verbalizing a visual memory may produce a verbally-biased memory representation that can interfere with the application of the original visual memory" (Schooler & Engstler-Schooler, 1990, p. 36). Thus, verbal recoding of a visual memory can result in a nonveridical, verbally-biased representation that overshadows the visual encoding. Schooler and Engstler-Schooler found that limiting participants' response time to 5 seconds (presumably long enough to activate the visual code but not its verbal counterpart) ameliorated the negative consequences of verbalization on recognition memory.

In addition, most states of affairs can be described in more than one way. These different descriptions can evoke different verbal representations that affect memory by interfering with one another (Mani & Johnson-Laird, 1982; Morrow, Greenspan, & Bower, 1987; Perrig & Kintsch, 1985). Perrig and Kintsch (1985) had subjects read a description of a town from either an aerial perspective (e.g., *North of the highway just east of the river is a gas station*.) or from the perspective of a motorist driving through (e.g., *On your left just after you cross the river you see a gas station*.) When later asked to draw a map of the town and recall the description, subjects in the aerial perspective condition found it easier to draw the map but more difficult to recall the description than did subjects in the driver perspective condition. Perrig and Kintsch argue that the aerial perspective description facilitates the construction of a spatial-situational representation of the town, which makes drawing the map easier. However, the situational representation may interfere with the propositional representation of the text and make recall of the propositional text base difficult.

Although these experiments are concerned primarily with effects of discourse comprehension on memory, analogous effects have been found for communicative use of language. For example, Wilkes-Gibbs and Kim (1991) presented subjects with a set of ambiguous graphic designs that could be

referred to by one of the two alternate expressions (e.g., *Viking ship* vs. *person swimming*), inducing them to encode the drawings by one or the other set of expressions, and then had them communicate about the figures in a referential communication task. Subsequently, their memory for the stimuli were biased in the direction of the label they used.

Analogous effects have been found using attitudinal objects and social information as stimulus materials. It often is the case that different linguistic expressions for the same state of affairs have different evaluative connotations. The social category once referred to as *crippled* or *handicapped* is currently often referred to as *disabled* or *physically challenged*. Although the expressions denote the same social category, evaluatively they connote somewhat different things. The verbal overshadowing hypothesis suggests that use of evaluatively-charged words may affect speakers' attitudes by evoking mental representations that are consistent with the terms' evaluative connotations. A series of experiments by Eiser and his colleagues provide evidence consistent with this view. For example, Eiser and Ross (1977) and Eiser and Pencer (1979) had subjects write essays reflecting their views on capital punishment. Some were instructed to employ words that were pro-capital punishment and negative in connotation (e.g., *irresponsible, indecisive, romanticizing*) and others to employ words that were anti-capital punishment and negative in connotation (e.g., *barbaric, uncivilized*). Subsequently, subjects' attitudes toward capital punishment changed in the direction of the words they had included in their essays.

Such effects of language use on attitude change tend to be relatively short-lived. Within six days, the changed attitudes of Eiser and Pencer's subjects had reverted substantially in the direction of their original attitudes. The fleeting effect of language use on attitude change is analogous to the transient attitudinal effects of heuristically-processed information. For example, attitudinal influences induced by a credible source subsides over time if the arguments presented by the source was weak, a phenomenon often referred to as the "sleeper effect"

(Hovland & Weiss, 1951). Although verbalization may lead to attitude changes, the changed attitudes are difficult to sustain in the absence of new supporting evidence.

Codability Effects

Referent codability refers to the availability of a linguistic form that will allow its referent to be denoted easily, rapidly, concisely and consistently. For example, we have words that make it easy to refer to certain shapes (triangles, trapezoids, etc.), but no convenient ways of referring to others. Similarly, we have names for certain person categories *(yuppies, intellectuals,* etc.), but not for others. Chinese has a term, *shì gù,* that refers to a person who is worldly, experienced, socially skilled, devoted to family, and somewhat reserved—a category for which there is no term in English.

One factor that can influence how a complex, multidimensional state of affairs will be characterized is how readily different aspects of it can be represented verbally. For example, people often have multiple reasons for a decision they make or for liking or disliking an attitudinal object, but not all of these reasons may be equally codable or readily characterized. When asked to explain why they hold a particular attitude or made a particular decision, other things being equal people will be more likely to give the reasons that are easy to express verbally, and, despite the fact that these reasons may not have been the ones that determined the original choice, they may come to dominate the speaker's decision and overshadow initial preferences. Consistent with this view, Wilson and his colleagues found that providing reasons for decisions can produce judgmental biases (e.g., Wilson, Dunn, Kraft, & Lisle, 1989; Wilson & Schooler, 1991; Wilson, Lisle, Schooler, Hodges, Klaaren, and LaFleur, 1993). Participants who were asked to give reasons for their choices of strawberry jams and college courses tended to make choices that were suboptimal, compared to participants who did not verbalize the reasons (Wilson et al., 1993).

The effects of referent codability on preferences in a communication context is illustrated in a just-completed experiment by Rosanna Wong and C–y. Chiu in which blindfolded subjects haptically explored textured ceramic floor tiles and, on the basis of this tactile information, evaluated each tile's suitability either for a sitting room or a storeroom. Subjects in an articulation condition described and later rated the tiles' suitability for one or the other room. People have relatively little experience describing tactile experience, and such sensations were expected to be generally low in codability. However, some aspects of tactile stimulation are more describeable than others. For example, a tile's roughness or smoothness can be readily and uniformly described, and subjects' descriptions in *both* the sitting room and storeroom condition tended to focus on such qualities. By contrast, a tile's expressive qualities (i.e., features that express the users' personality, values, and aesthetic preferences) seldom appeared in subjects' descriptions, and when they did, the descriptions (*feel like a tile for an orderly person*) were quite variable across subjects. In a control condition, subjects rated the tiles' suitability, but did not describe them.

Pilot studies revealed that people choosing floor tiles for a storeroom tended to focus on the more codable functional properties of the tiles (e.g., roughness), while people choosing floor tiles for a sitting room tended to focus on the tiles' less codable expressive qualities.

In the control conditions, preferences for sitting room and storeroom tiles were negatively correlated (r=-.61): a tile judged suitable for a sitting room tended to be judged unsuitable for a storeroom, and vice versa. However, these preferences were *positively* correlated (r=.76) in the articulation condition. Because the tactile information relevant to the tiles' suitability for a sitting room was difficult to express verbally, subjects instead used the relatively more codable linguistic terms for characterizing the tiles' suitability for a storeroom. If subjects' descriptions in the sitting room condition over-shadowed their preference judgments, we would expect a lack of correspondence between

judgments of the tiles' suitability for a sitting room in the articulation and control conditions, and this is what was found. In the sitting room conditions, the correlation between the preference ratings of the tiles in the no articulation and control condition was zero, whereas the corresponding correlation in the storeroom conditions was close to one (r=.93).

These findings are of particular interest considered in the historical context of the linguistic relativity debate. Brown and Lenneberg's (1954) finding of a positive correlation between color codability and color memory was seen as strong support for the linguistic relativity hypothesis. Subsequently, psychologists' confidence in the hypothesis was greatly undermined by the finding that cross-language differences in color codability did not predict differences in color memory for speakers of different languages, and that both color codability and color memory derived from universal sensory and perceptual processes. However, although cross-language differences in referent codability may have little cognitive consequence, codability may have non-trivial cognitive effects (e.g., on attitudes and preferences) when one is required to describe innominate (i.e., uncodable) attributes of an attitudinal object. We believe that such linguistic properties as referent codability must be activated by language use in order for them to affect cognition. A similar conclusion was reached by Kay and Kempton (1984), who found that color codability affected color perceptions only when the relevant color terms were used to encode the colors.

The Role of Language Use

We have described a number of phenomena that demonstrate cognitive effects of language use. Our central assumption is that actually using language to encode thought or to describe a state of affairs is critical for producing these cognitive effects. This is illustrated in a recent experiment by Wilson, Hodges, and LaFleur (1995), in which subjects read behavioral descriptions of a target person that contained both positive and negative elements, and then articulated

reasons for liking or disliking the target. Immediately before they verbalized their reasons, either the positive or the negative behavioral information was made cognitively accessible. This accessibility manipulation affected subsequent impressions of the target: subjects liked the target more when positive (rather than negative) behavioral information had been made accessible. In a control condition in which subjects memorized the behavioral descriptions instead of verbalizing the reasons for their attitudes toward the person, the accessibility manipulation did not affect subsequent impressions of the person. Such evidence suggests that language use is necessary for such biasing effects to occur.

To examine the role of language use in attitude change, Rebecca Cheung and C–y. Chiu had subjects indicate their agreement or disagreement with a social belief (e.g., collective interests are more important than individual freedom), embedded in a set of other items. Some subjects were asked to articulate the reasons for or against their own acceptance of the belief, and others were asked to think about reasons that supported or opposed it. Their responses to the items were again assessed after the manipulation. When subjects introspected or articulated reasons that supported their belief, no attitude change was observed, possibly because these reasons were already highly accessible to the subjects. However, articulating reasons against their initial belief increased the accessibility of counter-attitudinal cognitions and produced attitude change in the direction away from subjects' initial positions, while introspecting about counter-attitudinal reasons had no effect on attitudes. The results underscore the critical role of language use on cognition.

The differential effects of introspection and language use can be understood in terms of the representational model introduced earlier. Like verbaling an attitude object, introspection can activate propositional representations related to the attitude object. However, unlike verbalization, introspection does not facilitate the construction of a situation model that relates the attitude object to the speaker's experience of it. There is evidence that

compared to propositional representations, situation models can be more readily retrieved from memory (Schmalhofer & Glavanov, 1986), and have more enduring effects on subsequent cognitions (Kintsch, Welsh, Schmalhofer, & Zimny, 1990).

Context of Communication

Thus far, we have argued that the way a state of affairs is described, characterized, or labeled can affect the representation of that state of affairs in memory. Obviously, features of the state of affairs will be important determinants of how it is referred to. However, the specific form of the referring expression also will be affected by a number of extra-linguistic factors. The substance of our argument is that these factors, through their influence on language use, may also activate or create language-biased memory representations and by so doing have far-reaching cognitive effecfts.

The Referential Context

In communication, language use is grounded in a context, and how an object or event is described will depend in part on the context in which it is set. For example, in referential communication participants share a physical/perceptual environment that includes both the referent (the state of affairs being referred to) and nonreferents that are copresent with the referent.[1] The nonreferents may share common features with the referent and the referring expressions may incorporate information about the common features that is redundant. However, felicitous referring expressions must contain discriminating information—information about features that are distinctive for the referent.

Several studies have shown that the form of referring expressions will be affected by the nonreferent context (Hupet et al., 1991; Krauss & Weinheimer,

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[1]Frequently the referential context is implicit or projected. In describing someone to be met at the airport, the Describer must imagine the features that are likely to distinguish the target person from others who will be present and incorporate those features into the description.

1967; see Krauss & Fussell, 1996 for a review of this literature). In a just completed experiment by Chiu and Hong, subjects participated in a referential communication task in which half saw the concentric circles shown in Figure 1 as Set I and described the referent (B) so that the listener could select it from the copresent nonreferents, A, C and D. The remaining subjects saw the same B in Set II with nonreferents E, F and G, and described the referent to a listener.

In the Pattern Description Condition, subjects described the brightness pattern of the referent. With Set I as the context, subjects typically described the referent as consisting of two concentric circles (redundant information), with the outer circle being the darkest and inner circle being the brightest (discriminating information). Subjects using Set II tended to describe B as consisting of two concentric circles, with the outer circle being the brightest and the inner circle being the darkest. In the Position Description Condition, subjects described the position of the referent in the stimulus array.

A day later, subjects were shown all of the nonreferents (A, C, D, E, F, and G) and asked to rate their confidence that each was the stimulus they had described the day before. As expected, only for subjects in the Pattern Description Condition was memory for the referent systematically distorted to be consistent with the descriptions: Compared to subjects given Set II, subjects given Set I were more confident that a nonreferent with a brighter inner circle and a darker outer circle was the "referent" they had described. The effect was not found for subjects in the Position Description Condition.

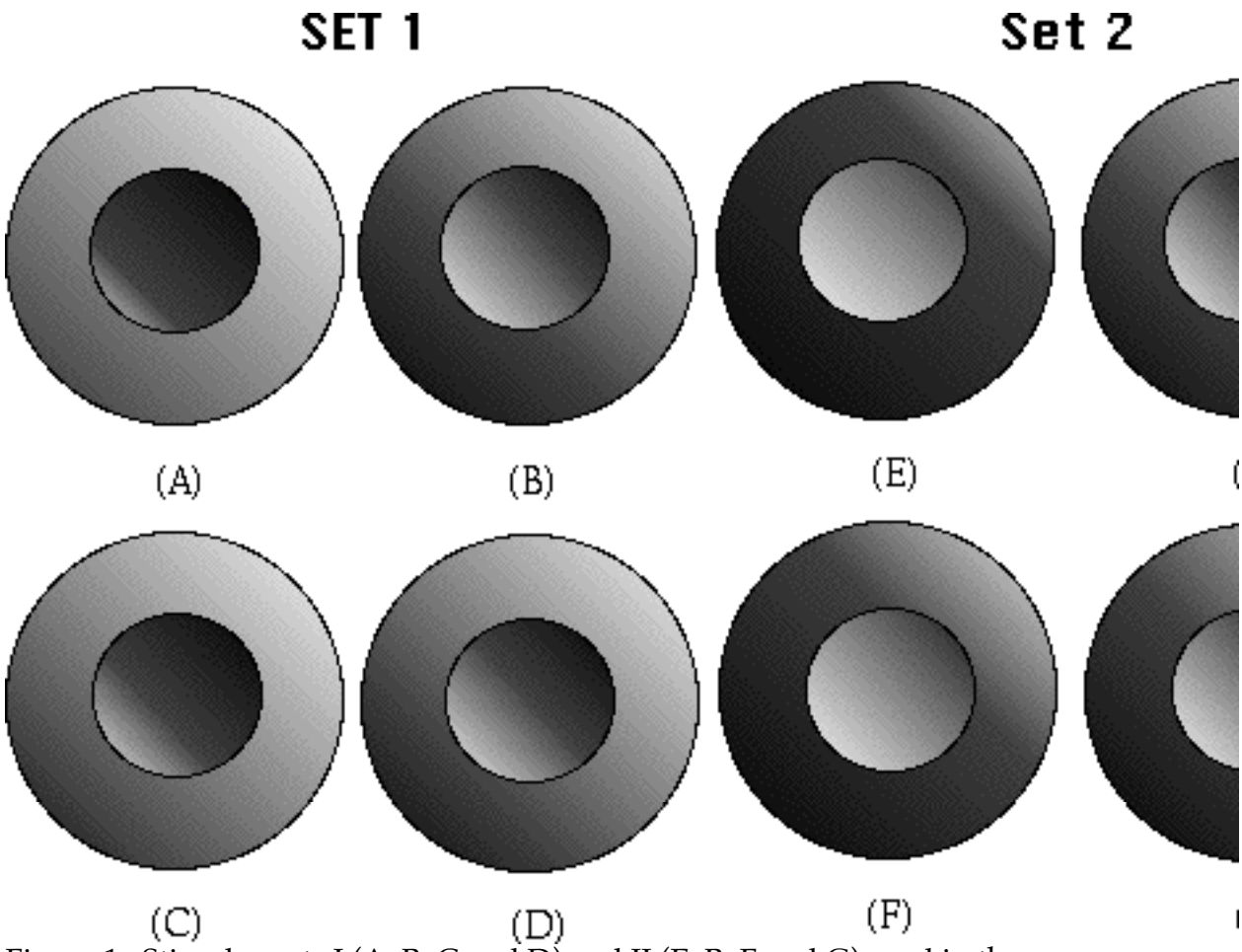

Figure 1. Stimulus sets I (A, B, C and D) and II (E, B, F and G) used in the Chiu and Hong experiment.

Audience Design

As Fussell and Krauss (1995) have argued, communication is more than an orderly sequence of encoding and decoding, in part because language is not a one-to-one mapping system in which a single, unambiguous meaning is associated with each message. To "understand" a message is to reconstruct the communicative intention that underlies it, and to accomplish this the listener must engage in a process of inference. In formulating a message, the speaker must try to anticipate the information the listener will need to infer the intended meaning. Specifically, speakers must make assumptions about the common ground they share with their listeners, and formulate their message in a manner consistent with what is mutually known (Clark & Marshall, 1981; Clark & Murphy, 1982; Clark, Schreuder & Buttrick, 1983). For example, a person talking

with a stranger will avoid idiosyncratic expressions that are unlikely to be part of their common ground (Fussell & Krauss, 1989a,b). Someone referring to city landmarks is more likely to call them by name when talking to people who are familiar with the city than to those who are not (Isaacs & Clark, 1987). In successive references to the same referents, speakers keep track of and utilize the mutual knowledge that has accumulated over the course of communication (Clark & Wilkes-Gibbs, 1986; Krauss & Glucksberg, 1977; Krauss & Weinheimer, 1966).

Audience design is the term used to describe the process by which speakers adapt messages to specific listeners. Generally speaking, research on this topic has focused on how the process is manifested in message formulation and the extent to which it facilitates message comprehension. Our contention is that speakers' efforts to formulate messages that are comprehensible to their listeners may have unintended consequences for the speakers' own cognitions.

The effects of audience design on the speaker's cognitions were tested in an experiment by Chiu et al. (1996) in which University of Hong Kong undergraduates described the shapes of ten U.S. states either to a grade school child or to a college student. As expected, the descriptions were formulated in accordance with the audience's perceived characteristics. Four decoders then decoded the descriptions from each condition by matching the state to each description. Errors in matching the descriptions were used to construct a similarity matrix of the states for each condition, and the resulting similarity matrices were subject to separate multidimensional scaling. Subjects also were presented with an incidental memory task for the states' shapes in which they were given the names of the 45 possible states pairs and asked to judge each pair's similarity from memory. Multimensional scalings were performed on the memory-based similarity judgments from the two audience conditions. Multidimensional structure derived from the recall measure of subjects in the grade school description conditions agreed highly with structures derived from

those descriptions, but not with a structure derived from descriptions in the college student description condition. These results suggested that designing a message to communicate to a particular audience can affect subsequent representations of the referent in the speaker's memory.

Audience design can enhance the accessibility of cognitions that otherwise might be relatively inaccessible, and by so doing increase the influence of those cognitions. In a recently completed experiment, Carmen Ying and Ivy Lau obtained University of Hong Kong undergraduates' private evaluations of their school. Almost unanimously, students ranked the university as the best in Hong Kong, suggesting that negative cognitions about the school were relatively inaccessible in this population. Other undergraduates evaluated the school after having described their impressions of the school either to themselves, to a student from another university, or to a reporter from a student publication notorious for its criticism of university policies. After describing their impression of the school to themselves, or to a student from another university, subjects' evaluations were highly positive. However, evaluations were markedly less positive after they had conveyed their impressions to the reporter—on average, they ranked their school as the second best in Hong Kong. Communicating to a listener who was critical of the school appears to have activated subjects' less accessible negative thoughts about the school, thereby lowering their evaluation of it. As in the Eiser experiments, these induced changes were relatively short-lived. Asked to give their evaluations of the school one day later, subjects in all experimental conditions gave highly positive evaluations.

Perlocutionary Intentions

Language is used communicatively to convey information, but it also is used to accomplish a number of additional purposes, among them the promotion of intimacy and effecting a positive self-presentation (Higgins, 1981; Higgins, McCann, & Fondacaro, 1982). As Austin (1962) noted, in addition to their illocutionary force, utterances also have perlocutionary force (i.e., an effect

on the listener). Typically, utterances are produced for the purpose of achieving such effects. As Krauss and Fussell (1996) have noted

> Speakers formulate their utterances in order to accomplish particular ends, and the way an utterance is formulated will be very much a consequence of the end it is intended to accomplish. …[T]he communicative intention that underlies an utterance is itself a product of a more general goal toward which the speaker's behavior is oriented. It makes sense to think of a *perlocutionary intention* (an intention to accomplish some specific result by an act of speaking) as underlying the speaker's communicative intention (pp. TK).

The relation between message formulation and its perlocutionary significance is suggested by a series of studies by Maass, Semin and their associates (Fiedler, Semin & Finkenauer, 1993; Maass, Milesi, Zabbini & Stahlberg, 1995; Maass, Salvi, Arcuri and Semin, 1989; Rubini & Semin, 1994) who asked subjects to describe behavior of ingroup and outgroup members. Previous research had shown that people tend to see positive ingroup, and negative outgroup, behavior as caused by group members' dispositional qualities; conversely, they tend to perceive situational inducement as the cause of negative ingroup, and positive outgroup, behavior. These perceptual biases are reflected in the tendency to use more abstract verb types in describing undesirable outgroup, and desirable ingroup, behaviors and more concrete verb types in describing desirable outgroup, and undesirable ingroup, behavior. Any particular instance of interpersonal behavior typically can be characterized in a variety of ways. As Semin, Fiedler and their associates have shown, describing concrete behavior using abstract linguistic categories attenuates the perceived causal contribution of situational factors and enhances the perceived causal contribution of dispositional factors (Semin & Greenslade, 1985; Semin & Fiedler, 1988).

Obviously, speakers try to formulate messages in a way that is consistent with their perlocutionary intentions. In a series of studies, Higgins and his associates (e.g., Higgins and Rholes, 1978; McCann, Higgins, & Fondacaro, 1991) demonstrated how descriptions of a person varied with the listener's attitude towards that person. Participants in these experiments were provided with evaluatively ambiguous behavioral descriptions of a fictitious person named "Donald," and asked to convey their impression to a listener who either liked or disliked Donald. Not surprisingly, messages were biased to be evaluatively consistent with the listener's attitudes toward Donald. However, shaping the message to accord with the listener's attitude also had cognitive consequences for the speaker. The speaker's subsequent recall of Donald's characteristics was distorted in the direction of the previously distorted message. It is important to note that subjects had to verbalize their message for memory distortion to occur. The recall of participants who were prepared to verbalize their impression, but did not actually write a summary of their impression, did not show such bias, suggesting that it is the actual *use* of language, and not the *intention* to verbalize or communicate, that has cognitive consequences.

Concluding Remarks

Research on communication traditionally has focused on how the listener is affected by the communicator's message. Such an approach conceptualizes communication as a process in which information is transferred from speakers to listeners through the medium of messages. Since the flow of information is unidirectional, so are its consequences.

However communication is, as Higgins (1981) puts it, a kind of "purposeful social interaction occurring within a socially defined context, involving interdependent social roles and conventional rules, stratagems, and tactics for making decisions and obtaining various goals." (p.346) In line with this view, we have discussed findings illustrating that speakers often take their listeners' perspectives, the non-referent context, and their own perlocutionary

intentions into consideration when formulating messages, and that these factors, through their effects on message formulation, can create language-biased memory representations of the referent in the speaker. Not only can communication influence the informational environment of the listener, it also can modify the speaker's representation of the referent within and beyond the immediate communication situation.

The linguistic relativity hypothesis has been shrouded in controversy since it was initially proposed in the 1930's. Unfortunately, neither Benjamin Lee Whorf nor his mentor Edward Sapir attempted to described the psychological mechanisms by which language influenced thought and traditionally research on this topic has fallen into one of two conceptual camps: One view, *linguistic determinism,* holds that the language one speaks determines one's perception of the world and a variety of cognitive processes (e.g., Hunt & Agnoli, 1991). The opposing position, *linguistic universalism,* contends that these cognitive processes are unaffected by language and invariant across speakers of different languages (e.g., Rosch, 1974). However, these two positions do not exhaust the possibilities for the relations of language and cognition, and we propose that a more productive approach would be to focus on the circumstances under which language has cognitive consequences.

Recently, investigators have begun to address the issue of *how* language could affect cognition (Hoosain, 1991; Hunt & Banaji, 1988; Hunt and Agnoli, 1991; Lau & Hoffman, in press; Semin, this volume). With a few exceptions (e.g., Semin, this volume), most of this research has focused on language as a medium of thought. The approach we have described in this chapter emphasizes another important function of language—the use of language for interpersonal communication—and attempts to explicate the effect of the communicative use of language on the cognitive processes of the user. We have examined three contextual constraints on language use (the nonreferent context, audience design, and the speaker's perlocutionary intentions), and considered how these factors

can affect the speaker's subsequent cognition via their influences on language use.

As speakers take their listeners' cognitions (knowledge, beliefs, attitudes, etc.) into consideration in an effort to produce messages that are relevant, appropriate, and comprehensible, the messages they formulate may create or evoke linguistic representations that differ from their private cognitions. The evidence seems clear that such representations can affect the way the speaker will later recall, think about and feel about the state of affairs under discussion. It is customary to regard communication as an orderly set of message exchanges through which participants come to affect how other participants think. In this chapter we have attempted to describe another way that participants are affected by communication—i.e., the consequences of producing messages. In an influential early essay on perspective-taking, Ragnar Rommetveit argued that even the simplest communicative act rests upon the participants' mutual commitment to "…a temporarily shared social world" (1974, p. 29). The evidence we have reviewed suggests that a possible consequence of sharing another's social world, even temporarily, may be to change the nature of one's own world. It has frequently been noted (e.g., Krauss, 1968) that one function of language use is to make the contents of speakers' minds accessible to the minds of their listeners. The burden of the proposal presented in this chapter is that the lines of influence are not unidirectional: using language to make the contents of our minds accessible to others may force us to incorporate all or part of their points of view into our own.

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