

## IDIOMATIC VERSUS LITERAL INTERPRETATIONS OF DITROPICALLY AMBIGUOUS SENTENCES

DIANA VAN LANCKER      GERALD J. CANTER  
*Northwestern University, Evanston, Illinois*

"Ditropically" ambiguous sentences (each having both a literal and an idiomatic interpretation) were prepared for listener's discrimination judgments, and for silent readers' rankings on an "idiomaticity" scale. Listeners were unable to discriminate the literal from the idiomatic versions when presented with randomized single sentences excised from paragraph contexts. There was a bias toward interpreting the sentences as idioms, which correlated with rankings of each sentence for its likelihood of idiomatic use. Listeners were easily able to identify the literal and the idiomatic versions of the same ditropic sentences presented in pairs or singularly, when speakers sought purposively to convey the contrasting meanings.

There is evidence from clinical and experimental studies that "prepackaged," unitary utterances, such as social formulas, idioms, and other stereotyped expressions, are represented by a different cerebral organization and are processed differently than are novel propositional expressions. Clinical evidence comes from observations of aphasic patients, typically with left-hemisphere lesions, who, although impaired in their ability to produce propositional speech, often retain facility for a subset of expressions named "automatic speech" by Hughlings Jackson (1878). These have subsequently been routinely described in the aphasia literature (Alajouanine, 1956; Brain, 1961; Critchley, 1970; Head, 1926/1962; Luria, 1978). Patients vary considerably in their repertoire of available utterances. They show a wide range of intact stereotyped expressions, from a single lexical item to phrases. What these various utterances have in common is a unitary structure; they are prepackaged verbal wholes, the constituent parts of which are not available for independent selection.

Stereotyped, conventional utterances also have been shown to have a special status in the transcortical aphasias.<sup>1</sup> Geschwind, Quadfasel, and Segarra (1968) described a patient with brain damage following carbon-monoxide poisoning. This patient's spontaneous speech consisted only of a few stereotyped utterances, but she repeated phrases with facility. In addition, she showed the "completion" phenomenon originally described by

<sup>1</sup>These are syndromes characterized by marked impairment of spontaneous speech coupled with relatively intact repetition.

*Diana Van Lancker, Ph.D., is currently a Research Associate in the Department of Physiology, UCLA, Los Angeles, California. Gerald J. Canter, Ph.D., is Professor of Speech and Language Pathology in the Department of Communicative Disorders, Northwestern University, Evanston, Illinois.*

Stengel (1936). Instead of merely repeating, she often completed proverbs, songs, and other well-learned verbal material begun by the examiner. For example, when the examiner said, "Ask me no questions," she responded, "Tell me no lies." Similarly, Whitaker (1976) examined a patient with presenile dementia who neither initiated speech nor responded appropriately, but who repeated phrases said to her by the investigator. The echolalic responses included grammatical corrections where appropriate. This patient also was able to complete phrases presented to her, when the phrases were pronounced on a nonfinal intonation contour with a final portion omitted. Some of the completions were semantically novel, but most were predictable completions of highly familiar phrases, proverbs, and well-known song titles and lyrics. The patient thus retained storage of a number of holistic phrases in the absence of any other language behavior.

An examination of the repetition behavior of a conduction aphasic<sup>2</sup> by Canter, Coughlin, and Van Lancker (1978) revealed that verbal formulas ("Easy does it," "Too many cooks spoil the broth") were repeated with an accuracy rate comparable to what was observed in single words ("purple," "emphasize"). Single words were repeated correctly 80% of the time; verbal formulas, 82%. The patient's accuracy in repeating less stereotyped phrases was much poorer, ranging from 20% for fairly familiar phrases ("You know how," "Go ahead and do it if possible") to 0% for phrases of low familiarity ("The vat leaks," "The lawyer's closing argument convinced him").

Although differential comprehension of stereotyped versus novel language is difficult to demonstrate, at least one study suggests that such differences indeed occur. Left-hemisphere-damaged patients were better at choos-

<sup>2</sup>Conduction aphasia is characterized by an impairment of repetition which contrasts with relatively well-preserved spontaneous speech.

ing a picture depicting such frozen figures of speech as "He had a heavy heart" than were right-brain-damaged patients, who chose the literal as often as the metaphoric depiction (Winner & Gardner, 1977).

Thus, there is clinical and experimental evidence that across various modalities of language, brain damage may have differential effects on the individual's performance with stereotyped, holistically-organized utterances as opposed to "newly-created" speech, formulated by the syntactic organization of constituents. Such evidence suggests that these contrasting types of language may have different neural substrata.

Phenomena which are observed in pathological states do not necessarily reflect the parameters of normal function. Nevertheless, language pathologies frequently highlight linguistic contrasts which are subtle in normal language behavior. Studies on normal individuals have in fact revealed distinctions similar to the holistic/analytic dichotomy so obvious in aphasia. A number of psycholinguistic studies using normal subjects have shown a difference in the ways unitary phrases versus "structurally-formulated" expressions are processed. Osgood and Hoosain (1974) showed that subjects are less apt to remember having seen the individual members of an idiomatic noun-compound than having seen the individual members of other kinds of noun-compounds. Another study, also using memory tasks as measures, demonstrated differences between subjects' responses to idiomatic ("hot dog") versus nonidiomatic ("hot meal") compounds (Horowitz & Manelis, 1973). In the recognition task, subjects were better able to recognize the constituent words of the nonidiomatic phrases; however, in cued recall, the idiomatic phrases yielded better performance. Another study used reaction-time measures in a noun-phrase identification task. Reaction times were shorter for noun phrases that were idiomatic, such as "on the wagon," than those that were not, such as "on the train" (Swinney & Cutler, 1979). Still another body of research on figurative language has demonstrated differences in both comprehension and production of frozen (e.g. "I went to the kitchen and *ate up a storm*") as compared to novel ("Then all of a sudden, the trees disappeared like *melting ice cream*") figures of speech in children (Pollio & Pollio, 1974, 1979). Similar studies involving composition, multiple-choice, and sentence-completion tasks using adult subjects also suggest that novel and frozen usage "represent two discriminably different aspects of figurative language" (Pickens & Pollio, 1979, p. 308). The diverse studies summarized here suggest that some kinds of phrases are stored as whole units, whereas their structurally-formulated counterparts are not.

A study by Lieberman (1963) suggested that common maxims and stereotyped phrases are pronounced differently from the same words making up novel phrases, resulting in a different acoustic signal. Speakers recorded such sentence pairs as "Neither a borrower nor a *lender* be" and "Never listen to a man who wants to be a *lender*." The experimenter excised the target word of each sentence and superimposed white noise to increase

perceptual difficulty. The listeners were better at recognizing the words originally said in the novel sentence than in the familiar sentence. This indicates that both the acoustic realization and the auditory perception of a word may be contingent on the speakers' and listeners' knowledge of redundancy of a particular word in a phrase.

Our study was conducted to investigate additional performance differences associated with holistic phrases and their structurally-formulated counterparts. Lieberman's study had shown differences in the production and perception of words excised from the whole sentence. We wished to look at entire sentences carrying different meanings, depending on whether they are perceived as wholes or understood in terms of their constituents. We selected sentences interpretable either as idioms or as literal statements, because such stimuli exemplify the holistic/analytic distinction suggested by the clinical and psycholinguistic literature. We coined the word *ditropic* to refer to sentences permitting these two classes of interpretation. For example, one might overhear the expression "He spilled the beans" and perceive either a literal or an idiomatic meaning. We wondered whether listeners would be able to perceive the intended meanings of ambiguous expressions when hearing them out of context.

## EXPERIMENT 1

Fifteen ditropic sentences (listed in Appendix 1) were embedded in pairs of disambiguating paragraphs (examples in Appendix 2). Each of five male native speakers of English read these thirty paragraphs in random order. These readings were done in a sound-treated room and recorded on an Ampex tape recorder (Model AG 440B). The readers were instructed simply to read clearly; no special instructions for contrasting literal and idiomatic expressions were given. From the tape recordings, the key sentences were excised and then spliced together in random order, with a seven-second pause between sentences. These recorded sentences were then played in a quiet room to 26 listeners—all graduate students or instructors in the Department of Communicative Disorders at Northwestern University. The listeners received instructions on the purpose of the experiment and were told to judge each sentence as sounding either "literal" or "idiomatic" by marking *L* or *I* on a score sheet.

### Results

Listeners were grossly inaccurate in discriminating these two kinds of sentences. A 50% accuracy rate would be expected by chance alone, and the listeners performed only slightly better than this, 54%. A *d'* statistic was computed for each sentence. This measure of discriminability, used in signal detection theory (described in Lee, 1971), was consistently low, showing that the listeners could not discriminate the two types of utterances at better than chance level. In addition, we noted a bias

toward answering "idiomatic" irrespective of the intent of the speaker. This was reflected in the high *beta* values obtained from the individual sentences, and in a significant *chi-square* computed for total responses (Table 1).

TABLE 1. Contingency table showing the total observed idiomatic responses and the observed total literal responses compared to the expected values.

	<i>observed frequency</i>	<i>expected frequency</i>
perceived idiomatic	2345	1950
perceived literal	1555	1950

$$\chi^2 = 160.0; df = 1; p < 0.001$$

## EXPERIMENT 2

The bias toward perceiving the recorded sentences as idiomatic led us to suspect that there was something in the sentences that made them seem idiomatic even when they could plausibly have literal meanings. We decided to look more closely at the individual sentences to see whether they differed from one another in their built-in or inherent idiomaticity.

We asked a group of 28 graduate students and instructors in the Department of Communicative Disorders to read silently and rank each sentence. Half the subjects were to indicate whether each ditropic sentence was likely, in their judgment, to be used idiomatically (1) primarily, (2) sometimes, or (3) rarely. The other half were asked to judge whether the sentences were used literally on the same scale. This was done to guard against possible influences of the instructions. When the data were examined, however, they were virtually identical: A sentence judged to be (1) primarily idiomatic by the one group was almost invariably judged to be (3) rarely literal by the other group. Therefore, the data for all 28 subjects were pooled into an idiomatic scale (the first described above).

## Results

As expected, some sentences received higher ratings of idiomaticity than others. Thus "straight from the horse's mouth," which one would be hard-pressed to imagine being used in a literal fashion, had a mean rating of 1.0, compared to a mean rating of 1.8 for "broke the ice."

We found a significant correlation between ratings on this task and the number of responses labelling the sentences as idiomatic on the listening task ( $r_s = 0.563$ ;  $N = 15$ ;  $p < 0.05$ ). That is, sentences which, when heard, were usually judged idiomatic, irrespective of speaker intent, were the same sentences which, when read silently by judges, tended to be rated as "primarily idiomatic." Similarly, there was a significant correlation

between the previously obtained *beta* values (showing bias towards perceiving the spoken sentence as idiomatic) and the judgments evoked by silent reading of the same sentence ( $r_s = 0.539$ ;  $N = 15$ ;  $p < 0.05$ ).

## EXPERIMENT 3

Despite the fact that Experiment 1 had shown that listeners generally were unable to distinguish productions of ditropic sentences intended to convey literal versus idiomatic meanings, we wondered whether the speakers' productions of these sentences were totally without influence on the listeners' perceptions. The contingency table (Table 2) suggests that—superimposed on the bias towards answering "idiomatic"—the speaker's intention may have had some effect. The table shows that (Cell A) listeners answered "idiomatic" more times when the intended meaning was idiomatic (than when the intended meaning was literal); and (Cell D) they answered "literal" more times when the intended meaning was idiomatic (than when the intended meaning was literal). Because the data in the four cells are not independent, no formal statistical test could be legitimately performed. Still the trend was sufficiently suggestive to lead us to design another experiment to determine whether speakers, under optimal conditions, could successfully convey literal and idiomatic meanings of these sentences. We selected a forced-choice procedure. Two speakers produced the sentences in pairs, idiomatic and literal, the intrapair order randomized through the list. The speakers were instructed to attempt to convey, as unambiguously as possible, a literal meaning in one instance of saying the sentence, and an idiomatic meaning in the other instance. This procedure was motivated by the findings by Lehiste (1973) in a study of syntactically-ambiguous sentences. In that study, a set of sentences yielded random judgments by listeners when speakers said the sentences without an awareness of the ambiguities. When the speakers were made aware of the ambiguities and attempted to convey specific meanings, listeners were much better able to make the distinctions.

The utterances in Experiment 3 differed, then, from the sentences in Experiment 1, in that (1) they were arranged in pairs, (2) they were produced in isolation (not in a paragraph context), and (3) speakers were trying to convey the contrasting meanings. Each speaker pro-

TABLE 2. Contingency table showing perceived meanings (listeners) compared with intended meanings (speakers).

	<i>intended idiomatic</i>	<i>intended literal</i>
perceived idiomatic	(A) 1229	(B) 1116
perceived literal	(C) 721	(D) 834

duced each pair twice, and these were tape-recorded. A listening tape was prepared in which two blocks of fifteen sentences from the first speaker were alternated with two blocks from the second speaker (instead of total randomization as in Experiment 1). This served to allow listeners to establish a set for each speaker.

After receiving appropriate instructions and training, 21 subjects (graduate students and instructors in Communicative Disorders and Linguistics) were asked to listen to each pair and to decide which member was literal and which was idiomatic. They were told that each pair contained one literal and one idiomatic sentence.

### Results

In contrast to Experiment 1, listeners did very well on this task. The mean number of correct literal-idiomatic identifications was 53 correct out of a possible 60 correct pairs (88%). The range was from 42 (70%) to 60 (100%) correct. This performance far exceeds chance ( $p < 0.001$ ) and shows clearly that speakers can indeed convey literal-idiomatic meanings of sentences out of context at least under the conditions of this experiment.

It remained to be determined if idiomatic/literal meanings can be perceived by listeners who hear but a single member of a pair. In other words, is it necessary to enhance perceptual distinctions by presenting the sentences in contrasting pairs, or are the cues supplied by the speaker sufficient to allow for correct identification of sentence type from single sentences?

## EXPERIMENT 4

Experiment 4 required listeners to identify individual sentences (without benefit of contrastive pairing) as idiomatic or literal. Fifteen of the 21 subjects who had participated in Experiment 3 served as listeners in this final task. The recorded stimuli were drawn from the previous experiment. Recordings of 30 sentences (15 literal and 15 idiomatic) from each of the two speakers were played to the 15 listeners. Following three practice pairs, 30 individual sentences from one speaker were presented in random order for identification as idiomatic or literal. Three practice pairs from the second speaker were then presented, followed by the 30 randomized single sentences from that speaker. There was thus a total of 60 test items for each subject to identify.

### Results

In Experiment 3 these 15 listeners (hearing pairs) had averaged 89.6% correct ( $SD = 7.52$ ); in Experiment 4, the mean (for singletons) was 85.5% correct ( $SD = 8.26$ ). The proportion of correct responses in each experiment is, of course, significant ( $p < 0.001$ ). Even though there was a tendency for the listeners to be somewhat more accurate when they heard paired rather than single sentences, the difference was not statistically significant ( $t = 1.73$ ;  $df = 14$ ;  $p > 0.05$ ).

These findings indicate that the pairing of ditropic sentences is not a necessary condition for correct identification; that is, the cues supplied by speakers in single utterances are sufficiently potent to allow listeners to make absolute identification of idiomatic versus literal meanings.

## DISCUSSION

The bias toward perceiving ditropic sentences as idiomatic (Experiment 1) is undoubtedly based on the listeners' previous real-language experiences, for which these sentences have far broader applicability as idioms than as literal statements. This interpretation was supported by having judges rank the individual sentences on a scale of idiomaticity (Experiment 2). These rankings correlated significantly with the scores on the listening task administered in Experiment 1. MacKay (1970) has shown a similar phenomenon using syntactically ambiguous sentences (such as "When Freud fed her dog biscuits"). Here, response times varied systematically with the relative probability of the two meanings.

Despite the low accuracy in subjects' discrimination of literal versus idiomatic meanings in the spoken sentences, there was some suggestion that listeners' responses were not wholly independent of speakers' intentions. That acoustic cues can communicate these different intentions was demonstrated in Experiment 3 and 4, in which subjects were able to discriminate the literal versus idiomatic realizations of ambiguous sentences presented in pairs and singly, when speakers attempted to communicate clearly the different meanings.

These findings are of interest with regard to certain intuitions and observations about literal and idiomatic phrases in everyday usage. Many of these kinds of expressions are so routinized as idioms in the listener's experience that a speaker must avoid them, or else mark them in a special way to indicate a literal meaning. For example, the phrase "She acts like she owns the place" has such a strong built-in idiomatic meaning that one would typically avoid using that phrase in a literal fashion (as in describing a person whose behavior suggests that she is in fact the owner). An example of a "literal marker" is seen in this paragraph:

City engineer Don Hurlbert had another theory: fluctuations in air pressure, perhaps caused by a blown-out window, might have caused more pressure to build up under the roof than above it, *literally* (emphasis added) blowing the roof off. ("Prizewinning Arena Collapses: Kansas City showcase in ruins." Architecture Section, *Time* (June 18) 1979, p. 74).

In speech, similar lexical markers can be employed. Or prosodic cues might be used, as the speakers in Experiment 3 and 4 apparently did successfully. Lehiste (1973) has suggested that certain prosodic contrasts, particularly temporal ones, may be used by speakers to clarify the intended meanings of syntactically-ambiguous sentences. The identification of the particular prosodic cues which can be used to disambiguate ditropic sentences is

the object of our continuing research. Initial acoustic analysis of the recorded sentence pairs correctly identified as idiomatic or literal in the present study suggests that longer word and phrase durations, inter-word pauses, and marked pitch-accents on content words, "A accents" (see Bolinger, 1965), are present in many of the literal phrases. In contrast, shorter durations (due to speeding up and reduced inter-word pauses) and fewer or weaker pitch-accents (contributing to a relatively smooth intonation contour) seem to characterize the idiomatic versions.

The present findings indicate that idioms, as exemplars of the unitary phrase, and literal utterances, as exemplars of the formulated phrase, are differentiated in both production and perception in normal individuals. The holistic/analytic distinction is thus found not to be restricted to language pathology but rather to be a fundamental linguistic contrast.

Might this contrast be reflected somehow in the organization of the nervous system? There is already evidence suggesting that cerebral laterality differences are associated with the holistic (right hemisphere)/analytic (left hemisphere) dichotomy (Curtiss, 1977, p. 235; Levi, 1974; Winner & Gardner, 1977; Zaidel, 1977). It should now be possible to test this laterality hypothesis more directly in speech production and perception, using such materials as the ditropic sentences described in this communication. Pertinent investigations could be designed to contrast the performance of left versus right brain-damaged patients, and to compare the performance of the two hemispheres in split-brain patients. In addition, it might be revealing to use ditropic language materials in dichotic studies of normal listeners.

In conclusion considerable clinical and experimental evidence suggests that verbal material may be processed either holistically or analytically. We sought to determine whether the perception of idiomatic versus literal sentences might reflect the holistic/analytic dichotomy. A set of ditropic sentences—sentences which have an idiomatic meaning when considered as a whole, but a literal meaning when understood as an organization of constituent parts—were presented to listeners and silent-readers in three experiments. The data from these experiments suggest the following conclusions:

1. Listeners are poor at discriminating the idiomatic/literal meanings of context-free ditropic sentences when speakers do not seek to emphasize one or the other meaning.
2. A strong tendency for listeners to interpret ditropic sentences as idiomatic correlated with rankings of the likelihood of idiomatic use made of the same sentences by silent readers. Therefore the degree of the bias is largely related to the likelihood that a particular sentence would have an idiomatic as opposed to a literal meaning in ordinary language situations.
3. When speakers purposively seek to convey the idiomatic or literal meanings of ditropic sentences, listeners easily are able to identify the intended meaning, whether the sentences are heard in pairs or singly.

## ACKNOWLEDGMENTS

We are appreciative of thoughtful guidance from Dwight Bolinger at several stages of this study. We wish also to acknowledge the helpful suggestions of Anne Cutler, Doris Kistler, and Dale Terbeek, the assistance of Rodger Colcord, Paul Hardee, Edith Li and Sarah Williams in preparing the stimuli and administering the tests, and the comments on an earlier draft of this paper contributed by Gilbert Krulee, Bonnie Litowitz, Michael Shipley, and Jim Wertsch. It goes without saying that these colleagues do not necessarily share all our ideas and conclusions.

This investigation was supported by Training Grant 5 T32 NS 07100-01 from the National Institutes of Health.

Requests for reprints should be addressed to Gerald J. Canter, Ph.D., Northwestern University, 2299 Sheridan Road, Evanston, IL 60201.

## REFERENCES

- ALAJOUANINE, T. Verbal realization in aphasia. *Brain*, 1956, 79, 1-28.
- BOLINGER, D. On certain functions of accents A and B. In I. Abe & T. Kanekiyo (Eds.), *Forms of English*. Cambridge: Harvard Press, 1965.
- BRAIN, R. *Speech disorders: aphasia, apraxia and agnosia*. England: Butterworths, 1961.
- CANTER, G., COUGHLIN, J., & VAN LANCKER, D. *On the repetition deficit in conduction aphasia*. Paper presented at the meeting of the American Speech and Hearing Association, San Francisco, CA, 1978.
- CRITCHLEY, M. *Aphasiology and other aspects of language*. London: Edward Arnold, Ltd., 1970.
- CURTISS, S. *Genie: A psycholinguistic study of a modern-day "wild child"*. New York: Academic Press, 1977.
- GESCHWIND, N., QUADFASSEL, F. A., & SEGARRA, J. M. Isolation of the speech area. *Neuropsychologia*, 1968, 6, 327-340.
- HEAD, H. *Aphasia and kindred disorders of speech*. New York: Macmillan Co., 1962. (Originally published Cambridge, England: The University Press, 1926.)
- HOROWITZ, L. M., & MANELIS, L. Recognition and cued recall of idioms and phrases. *Journal of Experimental Psychology*, 1973, 100, 291-296.
- JACKSON, J. H. On affections of speech from disease of the brain. In J. Taylor (Ed.), *Selected writings of John H. Jackson*. London: Hodder and Stoughton, 1932. (Reprinted from *Brain*, 1878, 1, 304-330.)
- LEE, W. *Decision theory and human behavior*. New York: John Wiley & Sons, 1971.
- LIEBERMAN, P. Some effects of semantic and grammatical context on the production and perception of speech. *Language and Speech*, 1963, 7, 172-187.
- LEHISTE, I. Phonetic disambiguation of syntactic ambiguity. *Glossa*, 1973, 7, 2.
- LEVI, J. Psychobiological implications of bilateral asymmetry. In S. Diamond & J. G. Beaumont (Eds.), *Hemisphere function in the human brain*. London: Paul Elek, Ltd., 1974.
- LURIA, A. R. *Basic problems of neurolinguistics*. The Hague: Mouton, 1978.
- MACKAY, D. Mental diplopia: Toward a model of speech perception at the semantic level. In F. D'Arcais & G. B. Levelt, & W.J.M. (Eds.), *Advances in psycholinguistics*. Amsterdam: North Holland Publishing Co., 1970.
- OSGOOD, C., & HOOSAIN, R. Salience of the word as a unit in the perception of language. *Perception and Psychophysics*, 1974, 15, 168-192.
- PICKENS, J. D., & POLLIO, H. R. Patterns of figurative language competence in adult speakers. *Psychological Research*, 1979, 40, 299-313.
- POLLIO, M. R., & POLLIO, H. R. A test of metaphoric compari-

- son and some preliminary developmental data. *Journal of Child Language*, 1979, 6, 111-120.
- POLLIO, M. R., & POLLIO, H. R. The development of figurative language in children. *Journal of Psychological Research*, 1974, 3, 195-201.
- STENGEL, E. On transcortical aphasia. *Zeitschrift fuer die Gesamte Neurologie und Psychiatrie*, 1936, 154, 778.
- SWINNEY, D. A., & CUTLER, A. The access and processing of idiomatic expressions. *Journal of Verbal Learning and Verbal Behavior*, 1979, 18, 523-534.
- WHITAKER, H. A case of the isolation of the language function. In H. Whitaker & H. A. Whitaker (Eds.), *Studies in Neurolinguistics* (Vol. 2). London: Academic Press, 1976.
- WINNER, E., & GARDNER, H. The comprehension of metaphor in brain-damaged patients. *Brain*, 1977, 100, 719-727.
- ZAIDEL, E. Concepts of cerebral dominance in the split brain. In Buser, P., & A. Rougeal-Buser (Eds.), *INSERM Symposium 6*. Elsevier/North Holland: Biomedical Press, 1978.

Received October 29, 1979.  
Accepted February 4, 1980.

## APPENDIX 1

Sentence stimuli used (idioms underscored)

1. You find it's rotten to the core.
2. She was to keep a stiff upper lip.
3. We saw that we had left no stone unturned.
4. It broke the ice.
5. It came straight from the horse's mouth.
6. He was at the end of his rope.
7. It took the wind out of his sails.
8. David spilled the beans.
9. I hit the sack.
10. That's a real snake in the grass.

11. The coast was clear.
12. He didn't know he was skating on thin ice.
13. I also had an axe to grind.
14. It was the usual procedure about once a week, to wash their dirty linen in public.
15. She had him eating out of her hand.

## APPENDIX 2

Sample paragraphs into which stimuli were embedded

### A Would-be Suitor Makes a Mistake

She had no apparent interest in him, but Bill persevered. He thought she was being coy. *He didn't know he was skating on thin ice*. Bill was asking a married woman for a date.

### The First Day of Winter

It was cold out but not late enough in winter to have frozen up the pond. John didn't see the warning sign placed near the skating pond in the park. *He didn't know he was skating on thin ice*. But luckily, his sisters screamed out from the shore until he heard, and edged his way back.

### Betrayal in Business

The merchant realized that his accountant, a man he had trusted, was cheating him. Thousands of dollars were missing over a period of years. The merchant told his lawyer that he had trained and even loved the young accountant. "How can I explain this?" he asked. "*That's a real snake in the grass*; how can he turn on me like this? I've fired him."

### A Scary Walk through the Field

A little boy stopped for a moment in the field when he heard the grass rustle off to the side. He took his brother's arm in fear. They watched something greenish slither away. "What's that?" he asked. "*That's a real snake in the grass*; we can catch it if we want to!" the older brother answered. "Let's catch it!"