The University of Colorado Meaning Norms

CAROL A. NICKERSON and DESMOND S. CARTWRIGHT
University of Colorado, Boulder, Colorado

There exist surprisingly few normative lists of word meanings even though homographs—words having single spellings but two or more distinct meanings—are useful in studying memory and language. The meaning norms that are available all have one or more weaknesses, including: (1) the collection of free associates rather than meanings as responses to the stimulus words; (2) the collection of single rather than multiple responses to the stimulus words; (3) the inclusion of only the two most frequently occurring meaning categories, rather than all meaning categories, for the stimulus words; (4) omission of the responses typical of each meaning category; (5) inadequate randomization of the presentation order of the stimulus words; and (6) unpaced presentation of the stimulus words. We have compiled meaning norms for 90 common English words of low, medium, and high concreteness using a methodology designed to correct these weaknesses. Analysis showed that words of medium concreteness have significantly more first-response meanings than do words of either low or high concreteness, lending support to the view that concreteness is a categorical, rather than a continuous, semantic attribute.

Researchers who study verbal behaviors need information about the semantic characteristics of English words in order to create, calibrate, or select appropriate verbal materials for their experiments. This need has led to the publication of a wide variety of normative word lists. These lists consist of collections of words accompanied by normative data about such semantic attributes as concreteness (Friendly, Franklin, Hoffman, & Rubin, 1982; Gilhooly & Hay, 1977; Gilhooly & Logie, 1980a, 1980b; Gorman, 1961; Paivio, Yuille, & Madigan, 1968; Spreen & Shultz, 1966; Toglia, Battig, Barrow, Cartwright, Posnansky, Pellegrino, Moore, & Camilli, 1978), imagery and imageability (Friendly et al., 1982; Gilhooly & Hay, 1977; Gilhooly & Logie, 1980a, 1980b; Paivio et al., 1968; Stratton, Jacobus, & Brinley, 1975; Toglia et al., 1978; Walker, 1970), meaningfulness (Gilhooly & Hay, 1977; Locascio & Ley, 1972; Noble, 1952; Paivio et al., 1968; Spreen & Shultz, 1966; Stratton et al., 1975; Toglia et al., 1978), frequency (Carroll, Davies, & Richman, 1971; Kucera & Francis, 1967; Thorndike & Lorge, 1944), categorizability and categorization (Battig & Montague, 1969; Cohen, Bousfield, & Whitmarsh, 1957; Posnansky, 1978; Shapiro & Palermo, 1970; Toglia et al., 1978; Uyeda & Mandler, 1980), familiarity (Gilhooly & Hay, 1977; Gilhooly & Logie, 1980a, 1980b; Stratton et al., 1975; Toglia et al., 1978), number of features (Toglia et al., 1978), pleasantness (Toglia et al.,

1978), pronunciability (Ley & Karker, 1974; Spreen & Shultz, 1966), and associates (Battig, 1964; Palermo & Jenkins, 1964; Postman & Keppel, 1970).

However, there are surprisingly few normative lists of word meanings available, even though homographs—words having single spellings but two or more distinct meanings—make excellent stimuli for the study of encoding specificity (e.g., Goldstein, Schmitt, & Scheirer, 1978; Light & Carter-Sobell, 1970; Winograd & Conn, 1971), recall and recognition memory (e.g., Kausler & Kamichoff, 1970; Rowe, 1973), set or priming (e.g., Cramer, 1968; Nelson, Walling, & McEvoy, 1979; Schvaneveldt & Meyer, 1973; Skanes & Donderi, 1973), transfer (e.g., Hashtroudi & Johnson, 1976; Mueller, Brown, & Kausler, 1975), imagery (e.g., Begg & Clark, 1975), cerebral laterality (e.g., Wollen, Cox, Coahran, & Shea, 1979), and even the relationship between psychopathology and verbal behavior (e.g., Benjamin & Watt, 1969).

The lack of word-meaning norms is probably due to the fact that most researchers rely on dictionaries and thesauri when information is needed about this particular semantic attribute. This solution is unlikely to be satisfactory for two reasons. First, dictionary and thesaurus searches are extremely laborious and time consuming. Second, although these sources certainly list the possible meanings of any given word, they give no indication of the relative frequencies of those meanings. The meanings in most dictionaries and thesauri are not usually arranged in order of frequency of occurrence, as is commonly supposed, so that one cannot assume even a rank ordering of meanings. In many experimental studies, however, information about meaning frequency is essential. For example, it is well known that the particular meaning attributed to a homograph is heavily dependent upon the context in which the homograph appears. For experiments

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judging the effects of context variation on verbal meaning, it is important for comparison purposes to know how often various meanings would be assigned to words without context (i.e., in the normative situation) (Cramer, 1970).

Unfortunately, the six meaning-norms word lists that are available (Cramer, 1970; Geis & Winograd, 1974; Kausler & Kollasch, 1970; Nelson, McEvoy, Walling, & Wheeler, 1980; Perfetti, Lindsey, & Garson, 1971; Wollen, Cox, Coahran, Shea, & Kirby, 1980) all have weaknesses. One problem centers on the methodology used to obtain meanings. In none of the six studies were subjects instructed to provide *meanings* for the stimulus words. Instead, in all the studies but that of Wollen et al. (1980), subjects were instructed to respond to each stimulus word with a *free associate*. For example, Perfetti et al. (1971) instructed their subjects to respond with "the first word that came to mind" (p. 1) upon hearing the stimulus word, and Nelson et al. (1980) asked their subjects to "write next to each word the first word that it makes you think of" (p. 16). The associates for each word were then assigned to meaning or sense categories by having two to five judges determine the meaning of the word most likely to produce each associate. Wollen et al. (1980) noted that this "semantic scoring" of free associates is a problematic technique for the determination of meaning because it is sometimes impossible to tell from the associate which meaning a subject encoded for the stimulus word. They attempted to circumvent this problem by instructing their subjects to use each stimulus word in a short phrase or sentence rather than to give a free associate to the word.

Why the compilers of meaning norms have not asked their subjects to provide a meaning rather than a free associate for each stimulus word is unclear. Comments by Perfetti et al. (1971) that "no mention was made [to subjects] of multiple meanings" (p. 1) and by Nelson et al. (1980) that "the instructions never mentioned the homographic nature of the stimuli" (p. 16) imply that free associates rather than meanings were collected in order to keep subjects blind as to the purpose of the studies. However, what the detrimental effect of asking subjects to respond to a stimulus word with a meaning rather than with a free associate would be is not evident. Furthermore, collecting meanings directly would have the advantage of lightening the onerous task of semantic scoring of word associates by multiple judges and should reduce the number of ambiguous responses to the stimulus words.

A second problem is that the methodology used in all six of the meaning-norms studies required only a single response to each stimulus word. Meaning norms based on single (that is, first) responses may be adequate for some experimental purposes, but a more useful and complete set of norms could be developed by requiring multiple responses to each stimulus word and then tabulating the response frequency of each meaning category of a stimulus word both for the first response and for all responses to that stimulus word.

A third problem is that not all of the studies list all of the meaning or sense categories of the stimulus words. The lists compiled by Kausler and Kollasch (1970) and Geis and Winograd (1974) report the frequencies of occurrence of only the two most commonly occurring meanings of the stimulus words, even though the data clearly indicate that a number of these words may have many more than two meanings. Some meanings are omitted, and others are combined; for example, Kausler and Kollasch (1970) combined the meanings of "just" and "beautiful" for the stimulus word FAIR.

A fourth and related problem is that some of the studies do not list, in addition to the meaning or sense categories of each stimulus word, the free associates assigned to each such category. Geis and Winograd (1974) list only the meaning categories, and Wollen et al. (1980) list only phrase exemplars of meaning categories. Kausler and Kollasch (1970) list only the two primary associates for each meaning category. Cramer (1970), Perfetti et al. (1971), and Nelson et al. (1980) do provide complete lists of associates accompanied by the frequencies or percentages of occurrence of those associates for each meaning category, so that it would be possible for a researcher to recombine associates into different meaning categories if he or she so desired.

A fifth problem concerns the presentation order of the stimulus words. Because the encoded meaning of a polysemous word is context dependent, it can be influenced by the previous word or words presented. Although they admit this dependency, the compilers of the meaning norms have not exercised much control over presentation order. Perfetti et al. (1971) used only two different word orders, one of which was the reverse of the other, and did not state whether the order of the words was randomized. Kausler and Kollasch (1970) used two different random orders, and Geis and Winograd (1974) used four. Cramer (1970) randomized the order of the stimulus words and presented 20 words on each of five pages of a test booklet. The five pages appeared in all possible orders; however, the words on any given page were always in the same order. Nelson et al. (1980) adopted a similar procedure, randomizing the order of eight pages of 40 words each, with the words on any given page apparently always appearing in the same random order. Wollen et al. (1980) noted the problem and attempted to exert a greater degree of control over the stimulus word presentation than had previous researchers by employing six different random orders and counterbalancing the pages on which the stimulus words appeared. No study has exerted maximum control by presenting the words to each subject in a different random order.

In criticizing the unpaced stimulus-word presentations of the Cramer (1970), Kausler and Kollasch (1970), and Geis and Winograd (1974) studies, Wollen et al. (1980) recognized a sixth problem of the previously compiled meaning norms. They noted that, in their experience, subjects in unpaced studies take much care in responding to the initial stimulus words but tend to rush as they near

the end of the stimulus word list. Accordingly, they employed a paced word presentation, as had Perfetti et al. (1971). Upon comparison of their results with those of Wollen et al. (1980), however, Nelson et al. (1980) concluded that greater control over the experimental situation, as operationalized in part by paced presentation of the stimulus words, does not substantially alter the proportions of responses allocated to the various possible meaning categories. It is unclear, then, whether pacing is necessary in word-norm studies. However, all six of the meaning-norms studies described here required only a single response to each stimulus word. Paced presentation seems to be imperative if multiple responses to each stimulus word are collected, as was the case in the present study, in order to prevent subjects from listing many responses to the initial words and few responses to the final words in the stimulus word list.

The present study attempted to correct the various weaknesses of the existing meaning norms by (1) instructing subjects to respond to the stimulus words with meanings rather than with free associates, (2) collecting multiple rather than single responses to the stimulus words, (3) listing all meaning categories for each stimulus word, (4) listing the responses typical of the meaning categories as well as the meaning categories themselves, (5) randomizing the presentation order of the stimulus words for each subject, and (6) pacing the presentation of the stimulus words.

METHOD

Subjects

One hundred and ninety-seven students enrolled in an introductory psychology class at the University of Colorado served as subjects in partial fulfillment of course requirements. All subjects spoke English as their native language.

Materials

For many experimental purposes, the usefulness of a set of meaning norms is increased if the words in those norms have varying numbers of meanings. There is some evidence (Cartwright, 1977; Toglia et al., 1978, p. 12) that the number of meanings assigned to a given word is related to the rated concreteness of that word. Therefore, words having varying levels of rated concreteness were chosen for inclusion in the present meaning norms. Thirty of the 90 words had been used in the preliminary testing of hypotheses regarding the relationship between number of meanings and rated concreteness (Cartwright, 1977). These words had originally been drawn from the Paivio et al. (1968) normative list and were chosen so that 10 of the words would have high concreteness ratings (defined as a C rating of 7.0), 10 would have medium concreteness ratings ($3.8 \leq C \leq 4.2$), and 10 would have low concreteness ratings ($1.0 \leq C \leq 1.7$). In order to ensure that the subjects would know each stimulus word, only words having fairly high meaningfulness ratings ($M > 5.3$) were selected.

In order to increase further the usefulness of these meaning norms to researchers of verbal learning and memory, the remaining 60 words were chosen from the Toglia et al. (1978), rather than from the Paivio et al. (1968), normative list. The Paivio et al. (1968) list contains normative information about the concreteness, imagery, and meaningfulness of each word in its collection, whereas the Toglia et al. (1978) list provides, for each word, normative information about familiarity, pleasantness, number of features, and categorizability, in addition to information about concreteness, imagery, and meaningfulness.

Although the concreteness ratings of words that appear in both the

Paivio et al. (1968) and the Toglia et al. (1978) normative lists are highly correlated across lists (Toglia et al., 1978, pp. 15-16), it was not possible to select from the Toglia et al. (1978) list enough highly meaningful homographic words for each concreteness level by using the same definitions of high, medium, and low concreteness that were used with the Paivio et al. (1968) words. In particular, there were not enough suitable words with concreteness ratings near 7.0, perhaps because the Toglia et al. (1978) list is not composed solely of nouns, as the Paivio et al. (1968) list is. Therefore, the following method was used to select words from the Toglia et al. (1978) list.

The frequency distribution of the concreteness ratings of the 2,854 words in the list was bimodal, with the modal points occurring at concreteness ratings of 3.0-3.5 and 5.5-6.0. This distribution was used to establish high, medium, and low concreteness levels. Words of high concreteness were defined as those having C ratings greater than or equal to the midpoint of the modal interval closest to the high-concreteness end of the distribution ($C \geq 5.75$). Words of low concreteness were defined as those having C ratings less than or equal to the midpoint of the modal interval closest to the low-concreteness end of the distribution ($C \leq 3.25$). Words of medium concreteness were then defined as those whose C ratings placed them in the lowest portion of the trough between the two modal points ($4.0 \leq C \leq 5.0$).¹ These definitions essentially widened the possible range of the concreteness ratings of the words at each concreteness level. Words were selected such that there were 20 at each of the three concreteness levels. Because it was not possible to select enough suitable words with high meaningfulness ratings from the Toglia et al. (1978) list, only words with medium meaningfulness ($3.5 \leq M \leq 4.5$) were chosen. It is important to note that the meaningfulness ratings of words appearing in both the Paivio et al. (1968) and the Toglia et al. (1978) lists are not highly correlated; furthermore, the mean meaningfulness rating of the words in the Toglia et al. (1978) list is much lower than the mean meaningfulness rating of the same words in the Paivio et al. (1968) list. Toglia et al. (1978, pp. 15-16) suggested that the differences in rated meaningfulness result from the different methods by which meaningfulness was assessed in the two studies, and noted that comparisons of the meaningfulness of words across lists are at best questionable. The entire collection of 90 words is shown in Table 1.

In order to make the task a reasonable one for respondents to be able to complete within 1 h, the list of 90 stimulus words was broken into two sets of 45 words each. Each set consisted of 5 words randomly selected from each of the Paivio et al. (1968) concreteness levels and 10 words randomly selected from each of the Toglia et al. (1978) concreteness levels. Each stimulus word was typed in capital letters at the top of a single page. A test booklet consisted of the 45 stimulus-word pages for a given word set plus a cover sheet of instructions. The order of the pages in each booklet was randomized so that the stimulus words were presented in a different order to each subject. Each subject received only one word-set booklet.

Procedure

The subjects were run in small groups of 10 to 20. Test booklets were randomized before distribution so that within each small group some subjects received the first word set and some the second word set. The cover sheet instructions read as follows:

The purpose of this experiment is to find out what meanings people commonly give to various words. The procedure will be as follows: at the top of each page in this booklet is typed a word. You will be given 30 seconds to write down on the page beneath the word as many different meanings of the word as occur to you, in whatever order they occur to you. For example, if the word is

MARK, you might write down the meanings

a boy's name
to grade papers
a foreign coin

etc. Please write only one meaning per line as shown in the example. When the 30 seconds are up, the experimenter will request that

Table 1
Numbers of Meaning-Classes for Stimulus Words

Concreteness Level											
Low				Medium				High			
Word	Source	MC	MCFR	Word	Source	MC	MCFR	Word	Source	MC	MCFR
ANGER	P	6	5	ARCH	T	25	20	ARROW	P	12	7
ANXIETY	P	6	6	BASE	T	23	17	AUTOMOBILE	P	2	2
BEING	T	6	6	CAPITAL	T	12	9	BASIN	T	9	7
CHANCE	P	14	11	COACH	T	9	8	BEAR	T	19	5
CUSTOM	T	6	5	CRANK	T	13	9	BELT	T	16	12
DEVOTION	P	5	4	DEED	P	7	5	BOW	T	13	13
DROP	T	33	9	DISASTER	P	4	3	CAMEL	T	9	3
EVEN	T	22	15	DYNASTY	P	5	5	CAR	P	5	2
FAULT	T	8	6	FELT	T	6	4	CARDINAL	T	11	9
FLOW	T	26	21	FILE	T	14	12	COLLAR	T	16	11
GRACE	T	12	7	FLUSH	T	17	13	COTTON	T	13	9
IDEAL	T	6	5	FUZZY	T	6	5	DOUGH	T	7	4
IN	T	16	9	HAIL	T	10	7	EMERALD	T	8	5
INTEREST	T	10	7	LEAD	T	14	10	HEEL	T	8	5
JOY	P	4	3	LEGISLATION	P	3	3	KEY	T	19	8
KNOWLEDGE	P	4	4	LORD	P	12	10	MICROSCOPE	P	1	1
LOYALTY	P	2	2	MARRIAGE	P	8	5	MOLE	T	14	4
MEMORY	T	7	3	MASS	T	11	7	OLIVE	T	12	6
MIGHT	T	2	2	MINE	T	5	4	PAGE	T	11	6
MOOD	P	7	6	PILE	T	11	8	PALM	T	14	3
MORAL	P	7	6	PLOT	T	11	8	PENCIL	P	3	2
PARDON	T	7	5	PRESENT	P	9	7	SHELL	T	23	8
PASS	T	23	14	ROLL	T	27	12	SKIRT	T	10	4
PASSION	P	15	9	SERIES	P	7	6	STRAWBERRY	P	13	6
RAISE	T	11	7	SHOCK	P	32	24	TAIL	T	14	9
REFINED	T	6	6	SLIP	T	24	9	THREAD	T	12	6
RULE	T	14	10	SWALLOW	T	8	6	TREE	P	7	4
SOUL	T	10	9	VISION	P	10	8	TRUCK	P	14	8
THINNER	T	5	5	WELL	T	10	8	TRUMPET	P	16	3
UTTER	T	2	2	WRAP	T	18	12	WINDOW	P	6	5

Note—P = words drawn from Paivio et al. (1968). T = words drawn from Toglia et al. (1978). MC = number of meaning-classes for all responses. MCFR = number of meaning-classes for first responses.

you turn the page. You are to stop writing immediately and turn to the next page where there will be another word for which you are to write down meanings. This procedure will be repeated for a total of 45 words.

Should it happen that you are unable to read a word because it is too lightly printed, wait quietly until the 30 seconds for that word are up and then when the experimenter requests you to turn the page, turn the page and begin writing meanings for the next word.

Do not turn the page until told to do so.

The 30-sec intervals were timed with a standard stopwatch.

RESULTS AND DISCUSSION

Meanings for the stimulus words in the first and second word sets were listed by 96 and 101 subjects, respectively. A single meaning listed for a stimulus word will hereafter be termed a "meaning-response." The actual phrasing of a meaning-response is called a "meaning-expression." The difference between the terms meaning-response and meaning-expression is rather subtle and is best illustrated by an example. If 12 subjects have listed "a scoundrel" for the stimulus word HEEL, there are 12 meaning-

responses but only 1 meaning-expression. Within a single subject, however, a meaning-response is the meaning-expression of that response; listing "a scoundrel" in response to HEEL is both that subject's meaning-response and his or her meaning-expression of that response. The legible meaning-expressions listed by subjects for any particular stimulus were categorized as (1) MEANINGS, (2) CONFUSIONS, (3) MISTAKES, (4) ASSOCIATES, or (5) BLANKS.

MEANINGS

If a meaning-expression listed by a subject as his or her meaning-response to a given stimulus word could be found in a dictionary, thesaurus, slang dictionary, technical reference, foreign language dictionary, or other published reference work, or was recognized as being a common usage of the stimulus word, it was accepted as a legitimate MEANING of the word. Legitimate MEANINGS included:

1. dictionary-style definitions

examples: LEAD—"the starring role"

MOLE—"a dark spot on the skin"

2. synonyms
examples: BASIN—"a washbowl"
ANGER—"wrath"
3. names of persons or the meaning expression "a name"
examples: JOY—"a girl's name"
ARCH—"short for Archie"
4. geographical place names
examples: EMERALD—"a bay in North Lake Tahoe"
PALM—"Palm Springs"
5. names of sport teams
examples: CARDINAL—"a football team"
BEAR—"a team name"
6. slang terms
examples: CRANK—"heroin"
BEAR—"something that is hard to do"
7. definition by example
examples: AUTOMOBILE—"Chevy"
DYNASTY—"Ming Dynasty"
8. metaphorical, poetic, or symbolic usage
examples: BEAR—"someone who is big"
MOLE—"a person with small eyes"
OLIVE—"a peace symbol"
9. the completion of a phrase in which the word is often found
examples: CAPITAL—"capital punishment"
CARDINAL—"a cardinal sin"
10. commercial product names, including beverage names, brand names, and company names
examples: JOY—"a dishwashing liquid"
ARROW—"a shirt company"
PASSION—"a drink"
11. technical or specialized terms
examples: CAMEL—"a skiing or iceskating maneuver"
FILE—"a deck of cards [computer science term]"
12. abbreviations
examples: MASS—"the abbreviation of Massachusetts"
CUSTOM—"short for customers"
13. foreign words
examples: DROP—"licorice in Dutch"
PARDON—"a French word"
14. parts of words
examples: IN—"a prefix"
IN—"a reagent in chemistry [suffix]"
15. interjections, exclamations, and expressions
examples: WELL—"expression"
PARDON—"sorry"
HAIL—"Southern pronunciation of 'hell' "
16. references to games, groups, records, and songs
examples: ARROW—"a card game"
CHANCE—"a Monopoly card"
DEVOTION—"a song by Earth Wind and Fire"
17. names of flowers, trees, and plants
examples: PASSION—"a flower"
COTTON—"a plant"
18. book titles and characters and places in books, in the movies, or on television
examples: OLIVE—"Popeye's girl friend"
EMERALD—"Emerald City (in *The Wizard of Oz*)"

Different meaning-expressions denoting the same underlying idea were combined into a single "meaning-class." Thus, the meaning-expressions "a fool," "a bad guy," "a jerk," "a fink," "an undesirable character," "a cad," "a scoundrel," and "a creep" for the stimulus word HEEL were all combined into the same meaning-class. In most cases, this combination could be performed on the basis of common sense, although occasionally it was necessary to consult one or more dictionaries. A check for combination reliability was performed for a small, randomly chosen subset of the stimulus words. An independent coder was given a list of the possible meaning-classes for each word in the subset and was asked to assign each MEANINGS meaning-response for that word to the appropriate meaning-class. Agreement with the original assignment of meaning-responses to meaning-classes was very high, ranging from 91 % (for VISION) to 100 % (for EMERALD).

The term "meaning-class" is equivalent to the terms "meaning category" and "sense category" used in other meaning-norms studies. Any one meaning-class may be composed of meaning-expressions representing one or several of the different kinds of legitimate MEANINGS

listed above. Indeed, because legitimate kinds of MEANINGS are not mutually exclusive, one meaning-expression may itself represent more than one kind of legitimate MEANING. Generally, however, a meaning-class contains meaning-expressions that belong to only one syntactical class; that is, the meaning-expressions within a meaning-class will refer only to nouns or only to verbs, etc. The set of all meaning-classes for a stimulus word constitutes the MEANINGS category of the stimulus word. The number of meaning-classes in the MEANINGS category of each stimulus word is shown in Table 1. The number of meaning-classes was tabulated both for first responses and for all responses to each stimulus word.

Table 2 lists MEANINGS meaning-classes for each stimulus word. The different meaning-expressions within a meaning-class are separated by commas and are shown exactly as the subjects wrote them, except that punctuation and spelling have been changed to conform to normal English usage, the article "a," "an," or "the" has been added to meaning-expressions that are nouns or noun phrases, and the infinitive form is always given for meaning-expressions that are verbs or verb phrases. The meaning-expressions listed for a meaning-class are not exhaustive; there may be other meaning-expressions that belong to a meaning-class that are not listed. An effort was made to select the most frequent or most representative examples of the meaning-expressions included in a meaning-class as exemplars of that meaning-class, in order to prevent the repetition of meaning-expressions that are trivially different.

For each stimulus word, Table 2 lists the frequency of responses (F) and the frequency of first responses [F(1st)] in each MEANINGS meaning-class. Because it was possible for a subject to list as meaning-responses more than one meaning-expression belonging to a meaning-class, the sum of the response frequencies totaled across all meaning-classes may be greater than the number of subjects. The sum of the first-response frequencies totaled across meaning-classes must, of course, be less than or equal to the number of subjects. Meaning-responses were not tabulated separately for male and female subjects, because Kausler and Kollasch (1970) and Wollen et al. (1980) have shown that the proportions of meanings assigned to each meaning category by males and by females are very nearly perfectly correlated.

CONFUSIONS

The second category of meaning-expressions shown in the tables is CONFUSIONS. A CONFUSION occurred when a subject mistook the spelling of a stimulus word to be that of another word having a similar or identical pronunciation. Thus, the meaning-expression "a milk bag" for UTTER is a CONFUSION for the word UDDER. In order for a subject's meaning-expression to be classified as a CONFUSION, he or she *must* have listed as meaning-responses to the stimulus word other meaning-expressions that could be classified as legitimate MEANINGS of that word, as described above. CONFUSIONS

meaning-expressions were grouped into meaning-classes and tabulated in the same way as MEANINGS meaning-expressions. The interpretations of F and F(1st) for CONFUSIONS meaning-classes are analogous to those for MEANINGS meaning-classes.

MISTAKES

A MISTAKE occurred when a subject misread a stimulus word as a completely different word and listed meaning-responses for that word rather than for the stimulus word. For example, four subjects misread MIGHT as RIGHT and listed meaning-responses for RIGHT, and one subject misread MIGHT as MIDGET and listed meaning-responses for MIDGET. Subjects whose meaning-responses to a stimulus word were classified as MISTAKES *never* listed as meaning-responses meaning-expressions that could be classified as legitimate MEANINGS of that word. MISTAKES could occur either because a stimulus word was poorly printed and therefore unreadable or because the subject, working under a time limit, did not read the stimulus word carefully before beginning to list meaning-responses. The first possibility does not seem to have occurred very often.

The meaning-expressions for MISTAKES were not grouped into meaning-classes, as the meaning-expressions for MEANINGS and CONFUSIONS were. Instead, an entry in Table 2 merely states that the stimulus word was mistaken to be some other word, specifies that other word, and gives the number of subjects (F) who misread the stimulus word to be that other word. F(1st) has the same interpretation as F for MISTAKES.

ASSOCIATES

When a meaning-expression could not be classified as a MEANING, a CONFUSION, or a MISTAKE, it was considered an ASSOCIATE. Thus, "contact lens" was an ASSOCIATE of VISION, and "chipped" was an ASSOCIATE of BASIN. Subjects who listed ASSOCIATES as meaning-responses to the stimulus words usually listed legitimate MEANINGS as well. The ASSOCIATES generally referenced MEANINGS already listed. For example, a subject who responded to BASIN with the ASSOCIATE "chipped" was also likely to have listed the MEANING "washbowl." It appears that subjects most often listed ASSOCIATES for stimulus words for which they could think of few meanings, in order to fill up the 30-sec interval for listing responses. Because of this duplication and because the instructions specifically requested that subjects list meanings, ASSOCIATES were not considered legitimate meaning-responses to the stimulus words and are not reported in Table 2.

BLANKS

The fifth category, BLANKS, occurred (1) when a subject listed no meaning-responses to a stimulus word, (2) when a subject listed no meaning-responses that could be classified as MEANINGS, CONFUSIONS, or MISTAKES meaning-expressions (i.e., he or she listed

only ASSOCIATES), or (3) when a word page was somehow missing from a subject's word set. F indicates the number of subjects for whom a given stimulus-word page was BLANK. F(1st) has the same interpretation as F for BLANKS.

Word Tables

Each word table within Table 2 lists the MEANINGS, CONFUSIONS, MISTAKES, and BLANKS for each stimulus word. The word tables are arranged in alphabetical order. Each word table indicates the number of subjects ($n=96$ or $n=101$) listing meaning-responses for that stimulus word. As noted above, the meaning-expressions in the meaning-classes for MEANINGS and CONFUSIONS are given exactly as written by the subjects. Any comments or clarifications by the authors are enclosed in square brackets. Some of the more common clarifications occur:

1. when it is unclear whether the meaning-expressions in a MEANINGS or CONFUSIONS meaning-class refer to the noun form or to the verb form of a stimulus word that can be interpreted as either a noun or a verb

example: ARCH—"to curve"
—"a curve"
—"curve [noun or verb unspecified]"

2. when the meaning-expressions in a MEANINGS or CONFUSIONS meaning-class for a stimulus word that is an emotion do not specify the exact nature of the emotion but merely state "an emotion" or "a feeling"

example: ANGER—"madness, being mad, hatred, ire, wrath, fury, hostility"
—"an emotion, a feeling [unspecified]"

3. when it may not be immediately apparent that the meaning-expressions in a MEANINGS or CONFUSIONS meaning-class refer to the slang usage of the stimulus word

example: CRANK—"speed, heroin [slang]"

4. when the underlying denotation of a MEANINGS or CONFUSIONS meaning-class may not be immediately obvious

example: ANXIETY—"nervousness, uneasiness, fear, apprehension, tenseness, uptightness, worried

anticipation [a negative emotion]"

—"anticipation, expectancy, anxiousness [a neutral emotion]"

—"eagerness, longing, hopefulness [a positive emotion]"

5. when a MEANINGS or CONFUSIONS meaning-class consists of many meaning-expressions that are definitions by example

example: CAR—"an automobile, a vehicle, an auto, a motor vehicle [and any specified make of car]"

6. as explanations of CONFUSIONS

example: THREAD—"a tire surface [confusion with tread]"

7. as explanations of MISTAKES

example: SOUL—"[word mistaken as SOUR]"

The MEANINGS meaning-classes, CONFUSIONS meaning-classes, and MISTAKES explanations in each table are ordered from most to least frequent occurrence within their respective categories, that is, from highest to lowest F. If the Fs for two (or more) meaning-classes are equal, the meaning-classes are listed in order from highest to lowest F(1st). In all but one of the previously published meaning norms (Nelson et al., 1980), the frequency of response for each meaning-class is reported as a percentage of the total number of responses across all meaning-classes. In the present meaning norms, however, frequencies rather than percentages are reported, in order to allow researchers more flexibility in using the norms. For example, some researchers may wish to consider CONFUSIONS to be legitimate meaning-responses to a particular stimulus word, particularly if there are many of them (as is the case with UTTER, for example). Considering CONFUSIONS to be legitimate meaning-responses changes the percentage of responses in each meaning-class from what it would be if only MEANINGS were considered legitimate meaning-responses. In addition, some researchers may wish to eliminate or combine meaning-classes. Implementing these options is simplified if frequencies rather than percentages are reported. It should be noted, however, that percentages should be computed before comparisons are made across words, because half the words have an n of 96 and half the words have an n of 101.

When the number of BLANKS for a stimulus word exceeds 5, an explanation is given in a footnote to the table

for that word. The number of BLANKS exceeds 5 for 13 stimulus words. The high number of BLANKS for the word OLIVE is due to this word page having been inadvertently omitted from several word booklets. The high numbers of BLANKS for the remaining 12 words are primarily due to the large numbers of subjects who listed only ASSOCIATES (and no MEANINGS) as meaning-responses to the stimulus words. Of these 12 words, 7 were of low concreteness, 3 of medium concreteness, and 2 of high concreteness. Although the distribution of these words across concreteness levels is not significantly different from that which would be expected by chance, it does suggest that subjects find it difficult to define abstract words.

Concreteness and Number of Meaning-Classes

It was mentioned earlier that there is some evidence that the number of meanings assigned to a given stimulus word is related to the rated concreteness of that word. Cartwright (1977) suggested that the semantic attribute of abstractness-concreteness is a categorical attribute rather than a continuous dimension, as is generally assumed. That is, any given stimulus word either is concrete ($C=7.0$), referring to "objects, materials, or persons" (Paivio et al., 1968, p. 5), or is abstract ($C=1.0$), referring to "concepts that cannot be experienced with the senses" (Paivio et al., 1968, p. 5). Why, then, do stimulus words have concreteness ratings that indicate an intermediate level of concreteness (i.e., $1.0 < C < 7.0$)? Cartwright reasoned that words seem to vary in concreteness because they may have many meanings, some of which are abstract and some of which are concrete. When subjects rate the concreteness of a stimulus word (e.g., DEED), some will think of the concrete meanings of that word and rate those (DEED = "a legal document"), and others will think of the abstract meanings and rate those (DEED = "an action"). When the concreteness ratings of the word are averaged across subjects, the mean rating will be a value near 4.0, seemingly reflecting a medium level of concreteness. Deviations from a mean of 4.0 then reflect the proportions of subjects rating abstract and concrete meanings.

One implication of this reasoning is that stimulus words of medium concreteness should have more first-response meaning-classes than do words of low or high concreteness. (Cartwright, 1977, assumes that any particular subject will think of only one meaning of a stimulus word—that is, the first meaning—when rating the concreteness of that word. Therefore this analysis is performed only for first-response meaning-classes.) A one-way analysis of variance performed on the number of first-response meaning-classes for words of low, medium, and high concreteness shows a small but significant effect of concreteness level on number of meaning-classes [$F(2,87)=3.88$, $p < .05$, $\eta^2 = .29$]. A Newman-Keuls test shows that, as hypothesized, the number of first-response meaning-classes for words of medium con-

creteness (mean = 8.80) is significantly greater than the number of first-response meaning-classes for words of high concreteness (mean = 5.90). However, the number of first-response meaning-classes for words of medium concreteness is not significantly greater than the number of first-response meaning-classes for words of low concreteness (mean = 6.97). This lack of significance is evidently due to the existence of outliers. Accordingly, the minimum and the maximum numbers of first-response meaning-classes were "trimmed" (Winer, 1971, pp. 51-54) from each concreteness level. A one-way analysis of variance performed on the trimmed data also shows a small but significant effect of concreteness level on number of first-response meaning-classes [$F(2,81)=4.72$, $p < .05$, $\eta^2 = .32$]. A Newman-Keuls test then shows that the number of first-response meaning-classes for words of medium concreteness (mean = 8.46) is significantly greater than the number of first-response meaning-classes for words of high concreteness (mean = 5.82) and for words of low concreteness (mean = 6.64).

The fact that words of medium concreteness have significantly more first-response meaning-classes than do words of either low or high concreteness does not, of course, lead to the conclusion that concreteness is a categorical, rather than a continuous, semantic attribute as has been assumed. It does, however, lend support to that proposition, as do findings of Toggia et al. (1978, p. 12). More research investigating this interesting and unusual view of semantic concreteness is needed.

Table 2
University of Colorado Meaning Norms

	F	F(1st)
ANGER (n=101)		
MEANINGS		
madness, being mad, hatred, ire, wrath, fury, hostility	76	64
an emotion, a feeling [unspecified]	25	17
frustration	22	14
to get someone else angry, to make someone mad, to irritate, to enrage	13	2
to become angry	3	1
a name	3	0
CONFUSIONS		
airplane anger [confusion with airplane hangar]	1	0
clothes anger [confusion with clothes hanger]	1	0
MISTAKES	0	0
BLANKS	3	3
ANXIETY (n=101)		
MEANINGS		
nervousness, uneasiness, fear, apprehension, tenseness, uptightness, worried anticipation [a negative emotion]	77	66

Table 2 (continued)

	F	F(1st)
anticipation, expectancy, anxiousness [a neutral emotion]	15	6
an emotional state, an emotion, feelings [unspecified]	14	12
stress	7	6
eagerness, longing, hopefulness [a positive emotion]	7	2
a psychological term, a Freudian term	3	2
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	7	7
<i>*The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.</i>		
ARCH (n=101)		
MEANINGS		
a part of the foot, the curve in one's foot	35	21
a building structure, an architectural term, a structure	26	14
a hallway, a gate, an archway, a tunnel [the notion of entryway]	26	14
a bent line, a rainbow shape, a shape like this $\cap$, $\cup$, half of a circle, a half circle shape	22	13
to bend, to curve, to lean back	22	7
a part of a bridge, a bridge	13	4
the St. Louis landmark, the Arc de Triomphe, a monument	10	6
a part of the back	8	2
most, top, highest (as in arch enemy)	6	1
bend, curve [noun or verb unspecified]	5	3
short for Archie, a name	5	2
a curved structure	5	2
a movement, a movement of the body	5	1
a curve, something curved, anything curved	4	1
a structural support, a support	4	1
to arch, to engage in archery	3	1
a natural formation, a rock formation	3	0
to describe an arched course	2	0
a part of a shoe	1	1
to raise an eyebrow	1	1
a rainbow	1	1
a parachuting position	1	1
a part of the mouth	1	0
mean	1	0
a trajectory	1	0
CONFUSIONS		
a boat [confusion with ark]	2	1
MISTAKES	0	0
BLANKS	3	3

ARROW (n=96)

MEANINGS		
weaponry, a bow and arrow, a projectile, a hunting weapon, a spear	86	68

Table 2 (continued)

	F	F(1st)
a directional symbol, a pointer, ↑, an indicator	45	10
a car model	16	3
a shirt company	15	5
straight, be straight, straight as an arrow	13	5
a name, a dog's name	7	1
an arrowhead	4	3
a sorority symbol	3	0
a record label	1	0
a formation	1	0
an alcoholic beverage	1	0
a card game	1	0
CONFUSIONS		
a spice [confusion with arrowroot]	1	0
MISTAKES	0	0
BLANKS	1	1
AUTOMOBILE (n=101)		
MEANINGS		
something to drive, a vehicle, a car, a truck, a bus, a motor vehicle [and any specified make of car]	85	81
transportation, mode of transportation, method of transportation, means of transportation	42	19
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
BASE (n=101)		
MEANINGS		
first base, a part of a baseball diamond, home plate [and any reference to baseball]	60	24
the bottom of an object	32	22
a foundation, what something is built upon, a support	23	11
an army base, a military installation, military headquarters [military specified]	22	4
alkaline, not acid, opposite of acid, a solution	21	8
coarse, vulgar, crude, lowly, common, primitive	17	4
a pedestal, a stand, a platform	14	6
the beginning, where you begin, the starting point	14	1
a home office	10	5
a home base [unclear whether reference is to baseball or to a home office]	10	2
the main part, the main purpose, a basis	7	5
a station, an installation [military not specified]	4	1
a square root, a mathematical root	3	1
the main mixture	3	1
a mathematical term	3	0
a safe place	3	0
a triangle part, a geometric term	2	1

Table 2 (continued)

	F	F(1st)
the amount of snow	2	1
the bottom of a column	1	1
a goal	1	0
a baseboard	1	0
a name	1	0
a root word	1	0
CONFUSIONS		
a drum, a cello, a musical instrument,	10	3
a guitar [confusion with bass]		
the lower key in music [confusion with bass]	8	0
remedial [confusion with basic]	1	0
MISTAKES	0	0
BLANKS	0	0
BASIN (n=96)		
MEANINGS		
a washbowl, a washbasin, a tub, a sink,	76	55
a waterbowl [a water container]		
a geographical feature, a bowl-like valley,	61	16
a dried lake, a lowland		
a bowl, a container	23	15
a pool, an enclosed water area, a lake,	16	3
a launch [an aquatic geographical feature]		
a hollowed area, a depression [not specifically geographical]	10	3
a ski resort	9	1
Basin Street New Orleans, Basin	4	0
Street Blues		
basin tub and tile cleaner, tub and tile	2	1
a bird bath	1	0
CONFUSIONS		
a musical instrument [confusion with bassoon]	1	1
MISTAKES	0	0
BLANKS	1	1
BEAR (n=101)		
MEANINGS		
an animal, a furry animal, a polar bear,	98	86
ursa [and any specified type of bear]		
to put up with, to tolerate, to stand,	28	4
to withstand, to endure		
to support, to carry, to hold	20	4
a grouch, a grump, a mean person	9	1
something that is hard to do, a difficult task	4	1
a name, a nickname	3	0
to put pressure on, to bear down	2	0
a kind of hug	2	0
to have, to possess	2	0
a team name	2	0
to act oppressively, to be overbearing	1	0
to have children	1	0
a drink	1	0
a toy	1	0
a rug	1	0

Table 2 (continued)

	F	F(1st)
to produce	1	0
to give	1	0
to give as testimony, to tell a lie	1	0
someone who is big	1	0
CONFUSIONS		
naked, nude [confusion with bare]	18	4
to lay bare, to uncover [confusion with bare]	1	0
MISTAKES	0	0
BLANKS	1	1
BEING (n=96)		
MEANINGS		
existing, existence, living, surviving	69	39
a person, a human being [human]	55	31
the verb form of be, is, a present tense	31	4
a creature, something that lives or exists [human not specified]	30	6
the self, the soul, the spirit	11	9
God	9	5
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
BELT (n=101)		
MEANINGS		
something to hold up pants, an article of clothing, goes around the waist, tightens dresses and skirts, suspenders	94	62
to hit, to slug, to punch, to spank, to hit someone, to strike	52	14
a drink, a shot of whiskey, a drink of liquor, a stiff drink	29	2
a zone, an area, a geographical area, a region, the corn belt, the green belt	21	4
hit, punch, slug [unspecified noun or verb]	13	5
a drive part, goes with a pulley, a fan belt	11	4
a hit, a punch, a hard blow	8	2
to drink, to drink whiskey	5	1
drink [unspecified noun or verb]	5	0
a conveyor belt, something used to send packages up a ramp	5	0
a seat belt	3	2
a strap, a strip	3	2
anything which encircles	3	1
a karate level	2	1
a name	1	0
to fasten	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
BOW (n=96)		
MEANINGS		
a bow and arrow, a weapon	66	37

Table 2 (continued)

	F	F(1st)
a ribbon, a hair ribbon, a package ribbon	36	14
to bend down at the waist, to curtsy	32	11
the front of a ship, a part of a boat	23	3
a bow tie, a necktie	17	5
curtsy [unspecified noun or verb]	16	7
a curtsy, a formal gesture, a gesture of respect, a man's greeting	15	7
bow-wow, a dog's bark	11	3
to bend	8	3
a part of a musical instrument	7	1
a bow knot	3	1
a bend, an arc	3	1
bend [unspecified noun or verb]	1	1
CONFUSIONS		
a boyfriend [confusion with beau]	3	0
a branch [confusion with bough]	2	1
a boy's name [confusion with Beau]	1	0
MISTAKES		
[word mistaken as ROW]	1	1
BLANKS	0	0
CAMEL (n=101)		
MEANINGS		
an animal, a humped animal, a desert animal, a dromedary	100	86
a cigarette brand	75	13
a tan color, a color, beige	23	1
a soft material, a material used for coats	5	0
a group's name	2	0
a World War I plane	1	0
a name	1	0
a paintbrush	1	0
a skiing or iceskating maneuver	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
CAPITAL (n=101)		
MEANINGS		
money, money accumulated, money free to use, money for investments, income	55	33
a city, the main city, the main city of a state, the main city of a country [city specified]	49	21
capital letters, large letters, uppercase letters	47	18
the government, an important place for leaders, the political area of a state, the seat of government [government specified]	26	8
the head of a state, the primary area of a state [neither city nor government specified]	20	8
gains and losses, gathered goods, possessions, property	10	2
good, excellent	10	2
important, central, primary	10	0

Table 2 (continued)

	F	F(1st)
capital punishment, punishment	4	1
the center of importance	3	3
the capitalistic system	2	0
an architectural term	1	0
CONFUSIONS		
a building [confusion with capitol]	19	5
MISTAKES	0	0
BLANKS	0	0
CAR (n=96)		
MEANINGS		
an automobile, a vehicle, an auto, a motor vehicle [and any specified make of car]	89	88
transportation, means of transportation	44	8
a train unit	13	0
a toy	6	0
a part of a ride at the carnival	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
CARDINAL (n=96)		
MEANINGS		
a bird, a red bird	84	50
a religious official, a religious office, a priest, a Catholic official, a Catholic office, a Catholic priest, a religious ruler [reference to "Catholic" or to "religious"]	77	28
a baseball team, a football team, a team name	45	7
a color, red	24	3
primary, chief, important, principal, first	14	3
a cardinal sin	14	1
the cardinal numbers, a mathematical term	13	2
the cardinal rule	12	1
a flower	1	1
a name	1	0
the points of the horizon	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
CHANCE (n=96)		
MEANINGS		
an opportunity, a try	41	26
a gamble, a risk, a guess, a dare, a bet	40	18
fate, luck, fortune	34	14
a happening, a coincidence, a circumstance, a random event, an uncertain event	17	10
probability, odds, percentage, likelihood	17	9
possibility, maybe, could be	12	4
to try something, to take a risk, to "chance it"	10	3

Table 2 (continued)

	F	F(1st)
a name	7	2
a game	6	1
a Monopoly card	5	4
a lottery ticket, a raffle ticket	3	1
a cigarette brand	1	0
to come upon, to find	1	0
a music group	1	0
CONFUSIONS		
[confusion with change]	5	2
MISTAKES	0	0
BLANKS	2	2
COACH (n=96)		
MEANINGS		
an instructor in a sport, a sports teacher, a supervisor in sports or athletics, the leader of an athletic team, a teacher of athletics [reference to sports]	50	42
a carriage, a buggy, a stage, a horsedrawn vehicle, a conveyance, a wagon, a vehicle, an Old West vehicle	50	15
to help, to instruct, to advise, to guide, to teach, to encourage [no reference to sports]	42	13
a tutor, a helper, a supervisor, a leader, a teacher, an advisor, a manager [no reference to sports]	26	15
a type of plane fare, an airplane fare, second class, certain seats on an airline	18	4
to train an athletic team, to lead a team, to guide a team, to teach a team [reference to sports]	11	2
a nickname for an instructor	3	1
a name for a bus	2	1
a type of shoe	1	0
CONFUSIONS		
a sofa [confusion with couch]	2	2
MISTAKES	0	0
BLANKS	1	1
COLLAR (n=101)		
MEANINGS		
a shirt collar, a coat collar, a part of a shirt	78	53
a dog collar, an animal collar	45	21
to grab, to arrest, to catch, to capture anything that circles the neck	31	8
the status of a worker, blue collar, white collar	10	4
a necklace	9	3
a preacher's collar, a priest's collar	5	3
an edge, a rim	5	2
a restraint	4	0
to put a collar on	3	2
a machine collar, a tool collar	3	0
to encircle, to surround, to go around	3	0

Table 2 (continued)

	F	F(1st)
a binding, something that goes around	2	1
an arrest	2	1
to hit	2	1
a chemistry instrument	1	0
CONFUSIONS		
a disease [confusion with cholera]	2	0
greens [confusion with collards]	1	0
MISTAKES	0	0
BLANKS	2	2
COTTON (n=96)		
MEANINGS		
a fabric, a cloth, a material, a clothing fiber, a material for making clothes, a material for making shirts	74	40
a plant	43	21
a ball of cotton, a fluffy white ball, a cosmetic puff	26	15
a cotton boll, a soft ball picked from a plant, a seed ball	11	8
to like, to be in harmony with	11	3
a fiber	8	4
a name, a last name, an animal's name	8	2
candy	5	0
a swab	4	2
a feeling in your mouth, a dryness of the mouth	3	1
a tree	2	0
cottonmouth [unclear whether reference is to mouth dryness or to a snake]	2	0
a kind of oil	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
CRANK (n=101)		
MEANINGS		
to turn something, to wind, to turn a handle	68	41
a crabby person, a mean person, a grump, someone in a bad mood	65	25
something to turn, a handle, a shaft, a tool, a lever	41	19
to start up (as a car or engine)	14	4
a part of a car machinery, a part of a machine	9	5
a crank call, a prank call	8	1
an eccentric, a fool, a crazy person	5	3
a prank, a joke	5	0
speed, heroin [slang]	4	1
fake, phony, false	4	1
a noise	3	0
to shift	1	0
a penis [slang]	1	0
CONFUSIONS	0	0

Table 2 (continued)

	F	F(1st)
MISTAKES	0	0
BLANKS	1	1
CUSTOM (n=101)		
MEANINGS		
a tradition, the ways of society, a ritual, norms, social ways of behaving, cultural practices [reference to a cultural or societal way of doing things]	85	67
individually made, custom made, personally made, made to order, made to individual specifications	36	9
a baggage check, a check when entering another country	22	5
a habit, an individual's way of doing something [reference to a personal way of doing things]	15	11
customary, what's usual, something always done, everyday things, a usual way of doing something [cultural or personal way of doing things not specified]	7	7
short for customers	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
DEED (n=96)		
MEANINGS		
a property title, a writ of ownership, proof of ownership, a lease, a mortgage, a land title, a will [document of property ownership implied]	69	45
an action, something that is done, an event, an act	51	27
a good action, a favor, a kind act	46	15
a legal document, a contract, an agreement [document, ownership of property not implied]	17	8
a bad action	4	0
a last name	2	1
to give title to property	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
DEVOTION (n=101)		
MEANINGS		
fidelity, faithfulness, dedication, zeal, allegiance, commitment [notion of loyalty]	76	73
love, adoration, affection [notion of love]	35	12
worship, prayers, religious rites [religious]	23	9
a song by Earth Wind and Fire	3	3
a perfume name	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	4	4

Table 2 (continued)

	F	F(1st)
DISASTER (n=101)		
MEANINGS		
a calamity, annihilation, a catastrophe, a terrible happening, a cataclysm, a holocaust, a tragedy, a misfortune, a crisis	94	94
an emotional disturbance, emotional distress, trauma	7	2
a mistake	2	1
the failing of an enterprise	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	4	4
DOUGH (n=101)		
MEANINGS		
batter, unbaked bread or cookies, a water and flour mixture, stuff that turns into bread when cooked	99	70
money, cash	79	28
something like dough, clay, a gooey substance	7	0
a doughboy	4	1
a name	1	1
fat	1	0
the color of a pale person	1	0
CONFUSIONS		
a musical note [confusion with do]	1	0
MISTAKES		
[word mistaken as TOUGH]	1	1
BLANKS	0	0
DROP (n=101)		
MEANINGS		
to let fall, to let go, to let down	80	63
a water drop, a piece of rain or water, a rain drop, a tear drop, a bit of liquid, a dribble	44	14
to leave off, to quit, to drop a class, to get rid of a class	23	4
fall, slip [unspecified noun or verb]	12	8
a small amount	11	1
to fall	10	4
to get rid of, to dispose of	5	0
candy	4	0
a measure, an amount	3	1
drip [unspecified noun or verb]	3	1
to break up a relationship	3	0
to forget	2	2
eye medicine	2	0
a drop off, a cliff	2	0
a book drop	1	0
licorice in Dutch	1	0
a fall	1	0
to land	1	0
to leave	1	0

Table 2 (continued)

	F	F(1st)
to go below	1	0
a kind of kick	1	0
something that falls	1	0
a dropcloth	1	0
to drop the subject	1	0
a cookie	1	0
to drop dead	1	0
a difference in height	1	0
decline in performance [unspecified noun or verb]	1	0
a lowering	1	0
to write (as in "drop a line")	1	0
the background of a set	1	0
a necklace	1	0
a con man's term	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	3	3
DYNASTY (n=96)		
MEANINGS		
a ruling family, a long lasting rule [reference to family]	34	30
empire, rulers, kingdom [no reference to family]	34	28
sovereignty, regime, power, supremacy [no reference to family or to government]	25	11
an era, the period of a rule, a time period [a time span]	21	17
Ming Dynasty	13	5
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	5	5
EMERALD (n=96)		
MEANINGS		
a stone, a jewel, a rock, a gem, a green gem	91	77
a color, a green color, green	65	10
Emerald City (in <i>The Wizard of Oz</i>)	24	5
a name, a girl's name	8	1
a bay in North Lake Tahoe, Emerald Sea, Emerald Pool in Yellowstone, a lake in Canada [a name of an aquatic geographical feature]	6	1
the Emerald Isle, Ireland	2	0
a perfume name [Emeraude, French for emerald]	1	0
a cutting form for precious stones	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
EVEN (n=101)		
MEANINGS		
equal, even-steven, same	62	35

Table 2 (continued)

	F	F(1st)
the opposite of odd, divisible by 2, 2 4 6 8 . . . numbers, multiples of 2	52	35
level, balanced, flush	25	6
fair	10	5
not jagged, straight, smooth	10	2
a tied score	9	3
also, too, including	9	1
to get even, revenge	8	2
although, though, except, however	8	1
a word indicating more validity, an intensive, even if, moreover, just as if, in spite of	8	0
to make flat, to make even, to balance	5	2
straight	4	2
parallel	4	2
not in debt	3	1
an adverb	3	0
still	2	1
maybe	2	0
square	1	1
to make equal	1	0
a name	1	0
night	1	0
symmetrical	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
FAULT (n=96)		
MEANINGS		
an earthquake area, a crack in the earth, uneven rocks, a fracture, a rock fault, a crevice	67	36
a mistake, responsibility, the cause of wrong doing, a failure, an error, negligence	64	37
blame [unspecified noun or verb]	25	12
a tennis error, a foul, a tennis term	20	4
a weakness, a failing, a wrongness, a bad point, a defect, an undesirable trait, an imperfection	19	3
to blame	10	4
a bad spot in material	2	0
to err	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
FELT (n=96)		
MEANINGS		
a material, a fabric	80	55
the past tense of feel, have feelled	39	12
touched	32	20
emotions, feelings, sensations, experienced emotion	29	7

Table 2 (continued)

	F	F(1st)
a sexual pass	3	0
roofing paper	1	0
CONFUSIONS	0	0
MISTAKES		
[word mistaken as FOOT]	1	1
BLANKS	1	1
FILE (n=96)		
MEANINGS		
to put in order, to arrange, to categorize	50	27
a tool, a smoothing tool, a nail file,	50	20
a wood file		
a cabinet, a container for documents, a	45	26
cabinet with papers in it, a place to		
store material		
to trim down, to smooth, to sand	25	4
records, a group of papers, a group of	19	3
documents		
a row, a line	17	3
an ordering arrangement, a means to	10	5
categorize items, an index		
to move in a line, to file out	8	1
a folder, an envelope	6	3
a deck of cards [computer science term]	3	1
to put in a request (as in "to file for a	3	0
divorce")		
a computer file	1	1
on file for reference	1	1
to degrade	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
FLOW (n=96)		
MEANINGS		
to run smoothly, to glide easily,	34	29
to slide smoothly, to run smoothly,		
to stream forth [no reference to water]		
a rush of liquid, a river's movement,	21	15
a movement of liquid, a rush of water,		
a stream of water, running water		
[reference to water]		
to move liquid, to make water run,	14	9
to gush water		
a river	12	8
a movement, a motion	8	1
stream, gush, trickle [unspecified noun or	7	6
verb]		
the direction, the direction things are	7	5
going, the way motion is going		
a continuous motion, continuity	7	5
a trend of mind, a state of mind, a mood	5	2
a stream	4	1
water running [unspecified noun or verb]	3	2
a diagram, a chart in computer	3	1
programming		
the stuff inside ski boots	3	1
energy movement, electron flow	3	1

Table 2 (continued)

	F	F(1st)
a flow of words, a flow of thoughts	3	0
that which slides smoothly, a smooth rush	2	1
of something		
ebb and flow	2	1
let it flow, let it go	2	1
the rate of streaming, speed	2	1
a movement of air	2	0
a natural progression	1	1
to flair out (as a flowing gown)	1	1
the mainstream of something	1	1
the movement of sound	1	0
the movement of a game	1	0
something making good sense	1	0
CONFUSIONS		
a name [confusion with Flo]	5	1
a type of ice [confusion with floe]	3	2
MISTAKES	0	0
BLANKS	0	0
FLUSH (n=96)		
MEANINGS		
to wash out with a rush of liquid,	82	48
to drain, to flush the toilet, to clean off,		
to dispose of, to rinse, to get rid of		
a poker hand, a card hand, a royal flush	32	12
to blush, to turn red, to turn pink,	18	7
to color		
a red face, a blush	14	7
blush [unspecified noun or verb]	11	7
to expel, to cause to come out,	11	4
to force out, to scare out, to hunt		
immediately adjacent, right next to,	9	2
together tightly, true-even		
red, pink	7	2
pale	6	2
to be embarrassed	5	2
to be hot	2	0
to become pale	1	1
a nickname	1	1
to look ill	1	1
wealthy	1	0
to exterminate [slang expression]	1	0
to be angered	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
FUZZY (n=96)		
MEANINGS		
furry, woolly, fluffy, hairy, soft, linty	79	58
not clear, blurry, unfocused, vague	44	23
fuzzy-wuzzy the bear, a bear's name	8	6
referring to a person's hair	6	2
a creature, a toy	4	2
a pet's name	3	0
CONFUSIONS		
the police [confusion with fuzz]	1	0

Table 2 (continued)

	F	F(1st)
MISTAKES	0	0
BLANKS	5	5
GRACE (n=96)		
MEANINGS		
a girl's name	62	35
a prayer, thanks, a prayer before meals	60	22
style, charm, poise, elegance, finesse, manners, smoothness [a personality quality]	42	12
physical grace, fluidity of movement, balance, not clumsy [a physical quality]	29	9
the favor of God, God's gift, God's blessing, a state of holiness	28	9
mercy, clemency, forgiveness, understanding, lenience, kindness	17	8
the period of time allowed for performance of an act or obligation	4	0
goodness, decency	3	1
a mythological personage	1	0
to honor	1	0
to enhance or decorate	1	0
the title of a religious person	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
HAIL (n=101)		
MEANINGS		
frozen rain, ice balls, precipitation, ice, a weather form	89	55
to praise, to show respect, to worship, to honor, to pay homage, to cheer	51	21
salutation, greetings	22	8
to call out, to cry out	19	9
to flag down, to summon, to call a cab	11	1
to greet	5	3
Southern pronunciation of "hell"	2	0
song title	1	1
to precipitate hail, to rain ice	1	0
a lot of things coming down at once	1	0
CONFUSIONS		
Nathan Hail [confusion with Nathan Hale]	1	1
hearty [confusion with hale]	1	0
MISTAKES	0	0
BLANKS	2	2
HEEL (n=101)		
MEANINGS		
a part of the foot, the end of a foot	74	54
a fool, a bad guy, a jerk, a fink, an undesirable character, a cad, a scoundrel, a creep	55	13
a dog following you closely, a dog walking at your heels, a dog sitting at your heels, a command to a dog	53	11
a part of a shoe, a part of a boot	41	19

Table 2 (continued)

	F	F(1st)
the end of a loaf of bread	17	3
the back part, the base	5	0
to walk, to step	3	0
a part of the hand	1	0
CONFUSIONS		
to cure [confusion with heal]	3	0
MISTAKES	0	0
BLANKS	1	1
IDEAL (n=96)		
MEANINGS		
perfect, preferred, best, just right, best possible, ultimate, utopian	79	57
a goal, a standard, something looked up to, a model, a mental notion of perfection, something strived for, an aspiration	38	17
a toy company, a trademark for toys	27	10
an idea, a thought, a belief	13	7
the name of a market, the name of supermarkets, a furniture store	9	5
a trademark, a brand name	6	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
IN (n=101)		
MEANINGS		
opposite of out, not out	48	40
denoting what's in fashion, in vogue, hip, with it, fashionable	35	7
indoors, inside a house [reference to entering a house or room]	29	21
inside, not outside	23	15
within, being in, contained	17	8
belonging, accepted by peers	7	3
a reference to a location, a certain space	4	2
a connection, an "in"	4	0
into	3	2
the in crowd	3	0
present	2	0
a reagent in chemistry [suffix]	1	1
internal	1	0
a prefix	1	0
an entrance	1	0
an opening	1	0
CONFUSIONS		
a hotel [confusion with inn]	4	0
MISTAKES	0	0
BLANKS	2	2
INTEREST (n=101)		
MEANINGS		
money accrued, dividends, money compounded on account, the return on money	55	32
to fascinate, to care about, to intrigue, to excite, to like, to stimulate, to want to know about	40	24

Table 2 (continued)

	F	F(1st)
something you like, something you desire to do, an attraction, a like, a liking, what you want or desire	26	17
curiosity, attention, wonderment	11	8
a hobby	8	5
interest, concern, like [unspecified noun or verb]	7	5
knowledge, a field of study	5	2
financial control	1	0
to make someone aware of	1	0
enthusiasm for	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	8	8

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

JOY (n=96)

MEANINGS

happiness, gladness, ecstasy, elation	95	83
a girl's name, a name	69	12
a dish soap, a soap, a detergent, a dish-washing liquid	30	1
a perfume	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0

KEY (n=96)

MEANINGS

an instrument to unlock something, a device to unlock a lock, an object to open a door	89	68
a clue, a solution, an explanation, an answer	62	19
the answer sheet for an exam	12	2
important	11	1
a means of gaining entrance	9	3
the tonic part of the scale	6	1
a key for deciphering a map	4	0
to focus in on something	3	0
an index	2	1
a drug measure	2	0
a geographical term, an inlet	2	0
a magazine name	1	1
typewriter keys	1	0
to key in, to enter	1	0
a symbol	1	0
decipher code [unspecified noun or verb]	1	0
anything like a key	1	0
a key club	1	0
a part of a basketball court	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0

Table 2 (continued)

	F	F(1st)
KNOWLEDGE (n=96)		
MEANINGS		
wisdom, understanding, experience, intelligence [a personal quality]	49	31
what is known, facts, information, concepts, facts known, truth, certainties, stored information, what a person knows [facts that are known]	42	35
knowing, to know something, learning, awareness, cognition, perception [a cognitive process]	31	18
know how, gaining new skills, common sense [competence in performance]	11	5
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	7	7

**The high number of BLANKS is due to the large number of subjects listing only associates and no meanings.*

LEAD (n=101)

MEANINGS

to lead someone, to guide, to take charge, to demonstrate, opposite of to follow, to show the way	68	38
a metal, a mineral, an ore	56	28
a pencil lead, pencil graphite	37	17
an element	20	7
a heavy material, something that is heavy	17	3
the front	8	3
a bullet	4	2
the head of something, the leader	2	1
a protective shield	2	1
the starring role, a head role in a play	2	0
a weight	2	0
a leash or rope	1	1
a clue in a mystery	1	0
an example (as in "to take my lead")	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0

LEGISLATION (n=96)

MEANINGS

laws, rules, rulings, enforcements, amendments, decrees [decisions made]	49	32
the creation of laws, the passing of laws, deciding issues, legal decisions, enacting laws, the passage of laws, the making of laws, passing bills [the making of decisions]	44	33
bills, matters under consideration, suggestions of new modes of governing, issues, proposals [decisions to be made]	18	8
CONFUSIONS		
a governmental branch, a body of government, a group that writes laws,	36	22

Table 2 (continued)

	F	F(1st)
a body of rulers, government [confusion with legislature]		
MISTAKES	0	0
BLANKS	1	1
LORD (n=101)		
MEANINGS		
God, Jesus, Krishna, a religious name	92	68
a nobleman, nobility, royalty	24	8
a king, a ruler	24	5
an expression, an exclamation, a curse word	15	1
a master, a superior	14	7
a feudal lord, a medieval rank, a medieval landowner	13	5
to rule over	6	0
a man of high rank, an important figure, a person with authority	5	3
a title	5	0
the keeper of the house in olden times, the master of the house, the head of the manor	3	2
a nickname, a name	3	1
a wealthy man	1	1
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
LOYALTY (n=101)		
MEANINGS		
the quality of being loyal, the state of being loyal, devotion, dedication, obedience, faithfulness, allegiance, being true to someone, steadfastness	85	85
a tie	1	1
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	15	15

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MARRIAGE (n=96)

MEANINGS		
the joining of man and woman, wedlock, matrimony, the legal bond of man and wife, the legal relationship of man and wife, the commitment of man and wife [the joining of persons]	75	63
a union, a combination, a joining, a merger, a bond [the joining of, persons or things not specified]	24	12
a wedding, a wedding ceremony, a ceremony	12	5
the joining of two things, the unity of something, the joining of two objects, the connection between two things [the joining of things]	10	3
a sacrament	2	2
the integration of two concepts	1	0

Table 2 (continued)

	F	F(1st)
sybiosis	1	0
the king and queen in pinochle	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	11	11

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MASS (n=101)

MEANINGS		
a religious service, a church service, a ceremony, a Catholic ritual	76	37
a weight, the measurement of substance, a quantity of matter, a physics term [a quantity of material]	56	28
a great deal of, a great number, lots of, abundance, a bunch of, a lot of, a large amount [a quantity; people or material not specified]	34	12
a large crowd, a large number of people, a group of people [a quantity of people]	31	12
a group of things, a group of something, a group of objects	23	7
the abbreviation of Massachusetts	11	4
to come together	3	0
directed towards the body of people (as in mass media)	2	1
the people or the workers	1	0
mass production	1	0
CONFUSIONS		
a part of a ship [confusion with mast]	2	0
MISTAKES	0	0
BLANKS	0	0

MEMORY (n=101)

MEANINGS		
recall, one's process of recalling, the ability to recall things, the system of storing information, the act of remembering, the part of the mind for remembering [a process or system for remembering]	85	64
a recollection, something that is remembered, a past event, a reminiscence, past thoughts [what is remembered]	40	25
remembrance, recollection [unclear whether reference is to what is remembered or to a process]	10	8
a part of a computer, a part of a calculator	8	0
a brand name	1	0
a game	1	0
in memory of	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	4	4

MICROSCOPE (n=101)

MEANINGS		
a device which magnifies small objects,	94	94

Table 2 (continued)

	F	F(1st)
a machine used to view small objects, a scientific instrument, a magnifier, a high power lens		
CONFUSIONS		
very small, precise [confusion with microscopic]	9	1
MISTAKES	0	0
BLANKS*	6	6

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MIGHT (n=96)

MEANINGS		
strength, power, force	80	59
maybe, probability, possibility, could possibly, may, perhaps	76	25
CONFUSIONS	0	0
MISTAKES		
[word mistaken as RIGHT]	4	4
[word mistaken as MIDGET]	1	1
BLANKS*	7	7

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MINE (n=101)

MEANINGS		
that which belongs to me, expressing possession or ownership, not yours	84	60
a pit for excavating minerals, an excavation site, an ore deposit, a gold mine, a coal mine	55	16
to dig for minerals, to dig	15	9
a tunnel, a hole in the ground, a cave	13	5
an explosive, a bomb	9	0
CONFUSIONS		
a German word [confusion with mein]	1	0
MISTAKES	0	0
BLANKS*	11	11

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MOLE (n=101)

MEANINGS		
an animal, a gopher, a burrowing animal, a rat, a rodent, a mouselike animal, a small mammal	88	48
a pigmentation of the skin, a freckle, a dark spot on the skin, a beauty mark, a birth mark, a wart	79	29
a chemical measure, a gram weight, Avogadro's number	27	12
a hermit, an introverted person	3	0
dark (as in "mole dark")	2	1
a club	1	0
an ugly person	1	0
a cartoon character	1	0

Table 2 (continued)

	F	F(1st)
a bookworm	1	0
someone with poor eyesight	1	0
a type of hole	1	0
a nickname	1	0
a person with small eyes	1	0
someone who likes the dark	1	0
CONFUSIONS	0	0
MISTAKES		
[word mistaken as MOLD]	1	1
BLANKS*	10	10

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

MOOD (n=96)

MEANINGS		
a state of mind, emotion, feeling [and any specified mood]	89	77
atmosphere, tone, setting	16	4
an attitude, a disposition	12	8
a temperament	7	4
a kind of music	3	1
the setting of a story	2	1
a grammatical tense	1	0
CONFUSIONS	0	0
MISTAKES		
[word mistaken as HOOD]	1	1
BLANKS	0	0

MORAL (n=101)

MEANINGS		
an idea accepted by society, ideas of right and wrong, values, ideology, standards of goodness, ethics, principles	63	48
ethical, straight, just, decent	32	19
a part of a story, the message of a story [reference to story]	22	11
a lesson to be learned, a meaning, a message, a lesson, a theme [no reference to story]	11	6
a name	5	0
morale	4	4
sexual inhibitions	1	1
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	12	12

**The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.*

OLIVE (n=101)

MEANINGS		
a food, a black or green food, a vegetable, a fruit, a black olive, a green olive, the fruit put in martinis	85	62
a color, green, a green color	47	19
a girl's name	21	2
Popeye's girl friend, a cartoon character	19	4

Table 2 (continued)

	F	F(1st)
a tree	13	3
an oil	13	1
a complexion color	5	0
a branch	3	0
a peace symbol	2	0
a mountain	1	0
a street name	1	0
a city in Europe	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	10	10

*The high number of BLANKS is due to this word page not being included in some of the test booklets.

PAGE (n=101)

MEANINGS		
a book page, the leaves of a book, a piece of paper in a book, a part of a booklet to be written on or read	66	35
a piece of paper, paper to write on	64	43
to call, to summon	40	8
a medieval servant boy, a king's servant, a courtier	31	4
a guide, a delivery boy, a messenger, a Senate messenger	27	8
a name, a last name, a first name, a girl's name	14	3
to turn pages	5	0
a haircut	3	0
to mark or number	1	0
an event (as a page in history)	1	0
an announcement	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0

PALM (n=96)

MEANINGS		
the hand, the inside of the hand, a part of the hand	87	49
a tree	76	43
a leaf, a branch, a frond	16	2
to steal	6	0
to place in the hand, to hold, to use one's hand, to carry	5	0
to conceal in the hand, to hide in the hand	5	0
the name of a garden, the name of a beach, Palm Springs	5	0
a basketball violation, holding a basketball	4	0
to get rid of	3	0
to slap	2	0
a name	2	0
to beg	2	0
to deal cards	2	0
to wave	1	0
CONFUSIONS	0	0

Table 2 (continued)

	F	F(1st)
MISTAKES		
[word mistaken as PAIN]	1	1
BLANKS	1	1
PARDON (n=96)		
MEANINGS		
to forgive, to exonerate, to release, to dismiss, to excuse	67	55
an apology, sorry, pardon me, excuse me, a polite expression, courtesy, said to excuse one's self	39	21
freedom from legal penalties, official release from guilt, amnesty, what Nixon got	27	8
to free from legal penalties, to let a criminal off the hook, to grant legal amnesty	12	8
reprieve, forgiveness, dismissal, dismissal of guilt	11	4
a French word	2	0
a name	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
PASS (n=101)		
MEANINGS		
to go by something, to move forward, to go ahead, to go on, to overtake	62	31
to not fail, to make the grade, to succeed on an exam	36	18
a mountain traverse, a mountain road, a road, a mountain crossing	32	15
to throw a ball, to throw, to throw something	20	4
a sexual advance, a sexual move	18	8
a paper indicating the right to travel past a point, a ticket, a passport, a paper giving rights	18	7
to hand over, to give to	17	6
to play in football, a football throw	10	5
to pass up, to forego, to not take, to skip, to waive, to not accept	8	1
to let go by	6	1
to ignore, to disregard, to pass over	5	0
throw [unspecified noun or verb]	3	1
to pass out [may or may not be "to faint"]	2	1
to neglect to take a turn	2	0
a throw	1	1
leave [unspecified noun or verb]	1	1
to die	1	0
a name	1	0
to get through	1	0
movement past	1	0
to faint	1	0
a leave	1	0
to show partiality	1	0
CONFUSIONS	0	0

Table 2 (continued)

	F	F(1st)
MISTAKES	0	0
BLANKS	1	1
PASSION (n=96)		
MEANINGS		
love, strong feelings for another person [attraction to or a feeling for a person]	59	38
a strong feeling, an emotion, intensity of feeling [no reference to attraction or to a feeling for a person]	55	41
physical desire, physical attraction, sexual attraction, lust [physical or sexual feelings]	20	6
a desire [attraction, no reference to a feeling for a person]	9	3
the name of a plant, a flower	9	3
devotion to, involvement with, dedication, obsession with something	8	1
a religious play, an Easter pageant	6	1
the name of a fruit, a fruit	6	0
an outbreak of anger, hate	6	0
the sufferings of Christ	3	1
joy	2	1
a drink	2	0
pink, a color	2	0
a goal	1	0
a book title	1	0
CONFUSIONS		
kindness, gentleness [confusion with compassion]	2	1
MISTAKES	0	0
BLANKS	0	0
PENCIL (n=101)		
MEANINGS		
something to write with, a writing utensil, a writing implement, a pen, a writing tool [and any description of a pencil]	96	94
to mark, to write in, to etch, to write, to sketch in, to write with a pencil	20	2
pencil-like, thin	4	0
CONFUSIONS		
	0	0
MISTAKES	0	0
BLANKS	5	5
PILE (n=96)		
MEANINGS		
a heap, a group, a lot of, a mound, a stack, a collection	75	60
to heap, to stack, to put on top of, to load	40	13
heap, group, stack [unspecified noun or verb]	10	8
piling, stakes, a beam, a post	8	2
a hemorrhoid, acne, a sore	6	2
a part of a carpet, the nap	6	2
to all jump on, to climb on	4	1
to crash, to plow into, to pile into	4	0
a nuclear reactor	2	2

Table 2 (continued)

	F	F(1st)
fur, a coat lining	1	0
a name	1	0
CONFUSIONS		
Gomer Pile [confusion with Gomer Pyle]	9	2
MISTAKES	0	0
BLANKS	4	4
PLOT (n=96)		
MEANINGS		
the theme of a novel, a story theme, the story line, a movie theme, the main action, the meaning	62	36
a piece of land, a tract of land	39	15
a grave, a cemetery piece of land, a burial ground	31	14
an action taken against something, a plan, a conspiracy, an attempt, a scheme, an idea, an evil plan	31	13
to connive, to plan, to scheme, to plan against, to devise	27	9
to make a map, to note, to mark points, to put in position on a graph, to graph, to draw, to set down	22	3
plan, scheme [unspecified noun or verb]	15	5
a garden patch, a grass patch	5	0
graph, chart, sketch [unspecified noun or verb]	5	0
a graph or map	1	1
to lay out an area	1	0
CONFUSIONS		
	0	0
MISTAKES	0	0
BLANKS	0	0
PRESENT (n=96)		
MEANINGS		
a gift	84	51
here, be in attendance, being in a place, at	50	13
time now, now, right now, here and now	42	17
to give to, to award to	42	8
to show	11	2
to introduce, to announce	8	2
to give a report, to offer an idea, to speak on a subject	8	0
a tense	1	1
existing, being	1	0
CONFUSIONS		
	0	0
MISTAKES	0	0
BLANKS	2	2
RAISE (n=96)		
MEANINGS		
to elevate, to make higher, to lift	88	67
more wages, an increase in salary, a pay hike	64	17
to bring up, to rear children	17	1
to increase prices, to increase rent	13	2
to leaven, to raise bread	8	1
to cultivate, to grow	7	2

Table 2 (continued)

	F	F(1st)
to arouse from the dead	3	3
to get up out of bed, to awaken	3	0
to bring up a subject or mention	1	0
to get excited	1	0
to multiply	1	0
CONFUSIONS		
the sun, sunshine [confusion with rays]	3	0
to destroy [confusion with raze]	2	2
MISTAKES	0	0
BLANKS	1	1

REFINED (n=96)

MEANINGS		
cultivated, well mannered, cultured, gracious, dignified, sophisticated, mannerly, genteel, elegant	58	36
made pure, purified, impurities removed, perfected, improved, made better, cleaned	47	35
processed, not in a raw state	13	8
polished, not rough, smoothed	12	5
fined again	6	1
more detailed, more specific, more precise, more exact	5	4
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS*	7	7

*The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.

ROLL (n=96)

MEANINGS		
bread, a bun, a pastry, a biscuit, a muffin, a croissant, a doughnut	74	54
to turn over and over, to make a circular motion, to spin, to turn, to somersault, to tumble, to rotate, to flip	65	29
a circular motion, a movement	10	0
fat, fat around the waist	7	2
a money word, a cylinder of coins or bills	7	0
material rolled up, paper rolled up	6	1
a somersault, a movement in gymnastics	6	1
a list of names, a roster	5	1
to fix a joint, to roll a cigarette	4	2
to make something flat, to flatten, to flatten pie crust	4	1
rock and roll music	4	1
a drum roll	4	1
to rob, to steal from	4	0
to push along	4	0
a rolling movement (as in throwing dice)	2	1
fall [unspecified noun or verb]	2	1
to wrap, to fold	2	0
to make into a cylinder	2	0
to make circular, to make round	2	0
to laugh	1	0

Table 2 (continued)

	F	F(1st)
something round	1	0
a hairdo	1	0
progressing or going well	1	0
a sexual term	1	0
a game	1	0
to roll film	1	0
to crash a car	1	0
CONFUSIONS		
a part in a play [confusion with role]	2	0
MISTAKES	0	0
BLANKS	1	1

RULE (n=101)

MEANINGS		
a law, a policy, a regulation, a code [a formalized rule]	63	41
to govern, to control, to dictate, to command, to lead	46	14
an instrument of measure, a rule, a yardstick, something used to measure	36	12
something to be followed, something to obey	21	18
a rule of thumb, a guideline, directions, a standard	15	7
to decide, to judge, to make a judgement	9	3
how to play a game, directions to a game	3	2
a slide rule	3	1
the reign of a king	3	0
to put lines on, to rule paper	3	0
a line	2	1
line [unspecified noun or verb]	1	1
a theorem	1	0
power over others	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1

SERIES (n=101)

MEANINGS		
a sequence, an ordered sequence, an order, one thing following another, one after another in sequence, a relationship in succession, a progression	81	56
the world series, baseball games, baseball playoffs, a set of games	61	29
a television show, a number of shows on some topic, soap operas	28	6
progressive numbers, numbers, numbers having a pattern	7	5
a book series, a magazine series	7	3
an electrical circuit	5	2
a money series	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0

Table 2 (continued)

	F	F(1st)
SHELL (n=96)		
MEANINGS		
the shell of an animal, a sea shell, an animal covering, the covering of sea animals, a tortoise shell	77	60
an oil company, a gas company, an oil trademark, a gas trademark, a gas station	40	14
an encasing, a case, an outer covering, protection, a protective covering	29	14
to take off the shell, to take off the skin, to peel, to crack open, to remove the hard covering from something	8	2
to give out, to shell out	8	1
an impersonal attitude, hiding one's self, being shy	8	0
ammunition, the casing for ammunition, a bullet shell	7	2
a nut shell, a peanut covering	7	0
egg shell	5	0
to bombard, to bomb	5	0
a blouse, a sweater	4	0
macaroni, a food	3	0
a name, a nickname	3	0
a weapon	2	0
to clean off, to husk	2	0
a camper shell	2	0
a shelter	2	0
a part of a house, the framework of a house	2	0
an atomic theory	1	1
to scoop	1	1
a band shell	1	0
a boat	1	0
one's body	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
SHOCK (n=101)		
MEANINGS		
an electrical shock, voltage, electricity, a current	69	31
medical symptoms, a physiological state, a medical state, a body condition	24	13
surprise [unspecified noun or verb]	17	10
a surprise, something unexpected, an unexpected happening	11	4
an emotional state	11	3
to scare	10	5
surprise, amazement, response to an unexpected event	10	5
to surprise, to amaze, to startle	10	2
shock absorbers, a part of a car	8	3
to electrocute	4	2
shock treatment	4	2
scare [unspecified noun or verb]	4	1
a trauma	4	1

Table 2 (continued)

	F	F(1st)
disbelief	3	3
fright	3	3
to horrify, to appall	3	0
a shock of hair	3	0
a stimulus	2	2
a stun	2	2
hurt [unspecified noun or verb]	2	1
future shock, culture shock	2	1
a scare	2	0
to stun	2	0
to give hurt to	2	0
a tremor, an earthquake	2	0
fear [unspecified noun or verb]	1	1
extreme fear [noun]	1	1
stun [unspecified noun or verb]	1	1
shock troops	1	1
a shock wave	1	1
a bunch of cornstalks	1	0
a jolt	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
SKIRT (n=101)		
MEANINGS		
a dress, clothing, an article worn by a girl, a woman's garment, a half-dress	100	90
to go around, to walk around, to go close to but around, to go around the edges, to skim around the edges	29	3
to avoid, to avoid an issue	24	5
the material covering something, the skirt of a tablecloth, a bed skirt, a Christmas tree skirt	16	0
tank skirts, car skirts, car molding, machine skirt, an equipment cover	6	0
the outside of something, the outer edge	5	0
to move quickly, to jump along, to scoot along	3	2
to border on	1	0
outskirts	1	0
to wrap around	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
SLIP (n=96)		
MEANINGS		
an undergarment, clothing, lingerie, a petticoat	77	38
to fall, to trip, to stumble, to lose your footing	53	21
a piece of paper	45	8
fall [unspecified noun or verb]	22	16
to slice	21	6
a mistake	11	2

Table 2 (continued)

	F	F(1st)
to say something inadvertently, to let out secrets	9	1
to make a mistake, to goof	8	0
a clumsy move, a fall, a loss of balance	5	3
something said inadvertently	5	1
to depart secretly, to break off	5	0
a piece of something	3	0
to give to secretly	3	0
to insert	2	0
to do poorly	2	0
a geological feature	2	0
to get by	1	0
to give someone the slip	1	0
a place where you put a boat	1	0
liquid clay	1	0
to put on	1	0
referring to smallness	1	0
a receipt	1	0
an acrobatic movement	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	0	0
SOUL (n=101)		
MEANINGS		
the spirit, the mind, the essence, being, the inner self, the inner being	93	70
soul music, black music, a type of music	39	12
black feeling, black awareness, related to blacks and black culture	22	5
soul food, food	14	3
depth of feeling	8	1
soul brother	5	1
a together feeling	4	1
rhythm, black rhythm	3	1
dancing	3	1
the base of something	1	0
CONFUSIONS		
a shoe part [confusion with sole]	8	2
a type of fish [confusion with sole]	4	1
the bottom of the foot [confusion with sole]	4	1
the capital of Korea [confusion with Seoul]	1	0
single [confusion with sole]	1	0
MISTAKES		
[word mistaken as SOUR]	1	1
BLANKS	1	1
STRAWBERRY (n=101)		
MEANINGS		
a fruit, a berry, a food	94	83
a color, reddish-pink	42	10
a scent, a fragrance, a smell	20	1
a flavor, a taste, a flavoring	20	1

Table 2 (continued)

	F	F(1st)
a burn on the skin, a scrape, a cut, a bruise	14	0
a complexion, a haircolor, blond	5	0
a birthmark	4	1
a perfume	4	0
a name	3	0
a plant	1	1
a lipstick	1	0
a record store	1	0
a type of horse—strawberry roan	1	0
CONFUSIONS		
a buzz, an insult [confusion with raspberry]	2	0
MISTAKES	0	0
BLANKS	4	4
SWALLOW (n=101)		
MEANINGS		
a bird	77	46
to eat, to digest, to chew, to gulp, to drink, to go through the throat, to ingest	61	33
gulp, drink [unspecified noun or verb]	31	17
a gulp, a drink	9	1
to be taken in, to believe	5	1
to engulf	4	1
to accept, to handle	4	0
to swallow one's pride	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
TAIL (n=96)		
MEANINGS		
the back part of an animal, a long hairy appendage, a fifth appendage	85	60
the end of something, the back end, the rear end	44	16
to follow, to trail, to track	25	6
the backside, the ass, the butt	8	4
the back of a coin, a side of a coin	7	2
a kite tail	7	1
the last	5	1
the tail gate, the end gate, the end of a truck, the end of a car	4	2
a part of a plane	4	1
a tuxedo, a suit	3	0
a following car	1	0
slang for a girl	1	0
a tail wind	1	0
to taper off	1	0
CONFUSIONS		
a story [confusion with tale]	4	0
MISTAKES		
[word mistaken as TALL]	2	2
BLANKS	1	1

Table 2 (continued)

	F	F(1st)
THINNER (n=101)		
MEANINGS		
not as fat, slimmer, skinnier, not wide, narrow, not fatter	80	62
paint thinner, a dilutant, turpentine	68	27
not thick, diluted, made less in consistency	15	6
more thin [unclear whether this is "not fat" or "not thick"]	5	2
a name	2	1
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	3	3
THREAD (n=96)		
MEANINGS		
a thin string, a material to sew with, a string to sew with, yarn, a filament, a thin cord, a fiber, a ribbon, a material used with a needle	93	80
to pass through a tube, to thread a needle, to work through a hole	35	7
to make one's way through, to wind through, to wind one's way through, to move through a crowd	11	3
clothes [slang]	9	2
a line of connectors, small connectors, a tiny part of something	8	0
the grooves on a screw, a groove in a bolt	5	0
to intersperse, to weave through	5	0
a small amount	3	1
something threadlike or hairlike	2	1
to throw a difficult pass in football	2	0
extending in time	1	0
a small clue	1	0
CONFUSIONS		
a tire surface [confusion with tread]	2	1
MISTAKES	0	0
BLANKS	1	1
TREE (n=96)		
MEANINGS		
a plant, a shrub, wood [and any specified kind of tree]	94	91
a genealogical chart, family descendents	10	1
a shoe tree, a hat rack, a rack [a rack]	7	1
to trap in a tree, to chase into a tree	5	1
a graph, a diagram	4	0
a name	1	0
a Biblical reference to the Cross	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2

Table 2 (continued)

	F	F(1st)
TRUCK (n=96)		
MEANINGS		
a vehicle, a big vehicle, an automobile, a car, a pickup [and any specified make of truck]	85	70
to move, to move on, to keep going, to leave	37	6
to walk, to walk jauntily, to strut	22	4
to move, to carry, to haul an item, to cart	22	4
transportation, mode of transportation	13	6
a hauling device, a cart	8	2
a large person, a strong person	6	0
to take care of business, to deal	4	1
a part of a skateboard	3	0
a truck farm	2	0
to have a good time	1	1
to dance	1	0
a name	1	0
to move via a truck	1	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	2	2
TRUMPET (n=101)		
MEANINGS		
an instrument, a musical instrument, a horn, a cornet, a bugle	94	93
an elephant's call, a swan's call	14	0
to blast, to blare, to sound off, to bellow loudly, to make a loud noise	13	2
a call, a yell, a noise made	8	0
to make an announcement, to pronounce	6	0
a kind of swan	3	0
a big nose	2	0
a device to detect sound, a hearing device	2	0
a bugler	1	1
the noise that a trumpet makes	1	0
to make a big deal about something	1	0
a blossom	1	0
to make a noise like a trumpet	1	0
to sing	1	0
to use a trumpet	1	0
a fish species	1	0
CONFUSIONS		
a bridge term [confusion with trump]	1	0
MISTAKES	0	0
BLANKS	5	5
UTTER (n=96)		
MEANINGS		
to speak, to whisper, to say suddenly, to mumble, to mention	91	81
complete, absolute, total, the ultimate, sheer	35	7

Table 2 (continued)

	F	F(1st)
CONFUSIONS		
a part of a cow, a milk bag [confusion with udder]	18	7
MISTAKES		
[word mistaken as OTTER]	1	1
BLANKS	0	0
VISION (n=101)		
MEANINGS		
sight, the ability to see, eyesight, perception through the eyes, a sense	95	81
a premonition, a sight of the future, a prophecy, a clairvoyant prediction	22	4
seen in the imagination, seen in the mind	15	4
a spiritual experience, a spiritual image, a miracle, a religious experience	13	3
a hallucination, an apparition, an illusion	12	1
a sight, an image, a perception	10	4
insight, understanding	10	1
a dream	10	0
enlightenment, revelation, truth	8	2
something beautiful or astounding to see	2	0
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
WELL (n=96)		
MEANINGS		
a water well, a water source, a drinking hole, a deep pit usually for water, a hole in the ground for water, a reservoir for water, a hole where water is found [reference to water]	79	40
healthy, feel well, opposite of ill	55	18
expression, exclamation, oh well, well?, interjection, indicates pause or hesitation	49	9
fine, good, satisfactory, in a good way	26	16
something like a well, a wishing well	11	4
a hole, a hole in the ground	7	5
a deep hole used to extract a liquid, an oil well [no reference to water]	6	2
a container, an inkwell	3	0
to build up	2	0
a last name	1	1
CONFUSIONS	0	0
MISTAKES	0	0
BLANKS	1	1
WINDOW (n=96)		
MEANINGS		
an opening, a hole, something to look out of, a hole in the wall [an opening]	56	41
glass, a glass panel, a pane, a piece of glass [the glass]	46	33
a glass opening, glass to look out of, a hole in the wall covered with glass [an opening with glass]	14	12

Table 2 (continued)

	F	F(1st)
the windows of my mind, insight	5	2
a lens	1	1
an area for entry	1	0
CONFUSIONS	0	0
MISTAKES		
[word mistaken as WIDOW]	1	1
BLANKS*	6	6
*The high number of BLANKS is due to the large number of subjects who listed only associates and no meanings.		
WRAP (n=101)		
MEANINGS		
to enfold, to cover, to enclose, to envelop, to surround, to put a covering around	49	35
a scarf, a shawl, a coat, a sweater, a cloak	25	10
outside paper, plastic wrap, aluminum wrap, gift wrap, saran wrap	16	8
to cover a package, to cover a gift	16	2
to cover with paper, to enclose with paper	12	11
to cover, an outer layer, a covering, something used to cover	11	5
cover [unspecified noun or verb]	10	5
a clothing article	5	0
to wrap it up, to finish	4	0
to wrap someone around a tree	2	1
to tackle in football	1	1
to put on clothes	1	1
leg coverings	1	1
to embrace	1	1
to be preoccupied in	1	0
to conceal	1	0
a skirt	1	0
to tie up	1	0
CONFUSIONS		
to hit, to strike [confusion with rap]	12	6
to knock [confusion with rap]	8	1
talk [unspecified noun or verb] [confusion with rap]	5	4
to talk [confusion with rap]	5	1
hit [unspecified noun or verb] [confusion with rap]	4	1
the blame [confusion with rap]	3	1
blame [unspecified noun or verb] [confusion with rap]	3	0
knock [unspecified noun or verb] [confusion with rap]	2	1
to blame [confusion with rap]	2	0
a court charge [confusion with rap]	1	0
a knock [confusion with rap]	1	0
a hit [confusion with rap]	1	0
a talk [confusion with rap]	1	0
MISTAKES	0	0
BLANKS	5	5

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NOTE

1. The concreteness ratings of a few words drawn from the Toglia et al. (1978) normative list exceed slightly the limits of the concreteness

levels (high, medium, or low) to which they are assigned. This occurs because the concreteness ratings of the words in the present study were not actually drawn from the Toglia et al. (1978) norms, but from an earlier preprint of those norms. The slight discrepancies in concreteness ratings between the two versions of the norms are due to differences in the computational methods used in the two versions.

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