Word norms for blind and sighted subjects: Familiarity, concreteness, meaningfulness, imageability, imagery modality, and word associations

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Normative values for word characteristics were obtained from a sample of 12 college-educated, totally congenitally blind subjects on the basis of their ratings of 161 nouns on scales of familiarity, concreteness, meaningfulness, and imageability. The dominant modality of imagery for each image-evoking word and the strongest word associate for each item also were recorded. The same data were collected for a group of sighted subjects, both to provide a comparison group for the blind subjects and to test the comparability of sighted subjects' ratings with existing norms. Ratings for sighted subjects correlated strongly with those norms, although the coefficients were slightly higher for ratings of concreteness and imageability than for ratings of familiarity and meaningfulness. Ratings of blind subjects correlated only slightly lower with existing norms for imagery and concreteness, but considerably lower for familiarity and meaningfulness.

Thanks, in large part, to the pioneering work of Allan Paivio and his associates, there has been considerable interest over the past several decades in mental imagery and the effect that word values such as concreteness, imageability, and meaningfulness might have on the imagery process. This interest has resulted in the creation of a number of lists of word norms for items rated on a variety of dimensions. Primary among these normative resources is Paivio, Yuille, and Madigan's (1968) frequently cited list of ratings for 925 nouns on the dimensions of concreteness, imagery, and meaningfulness. Rubin and Friendly (1986) have recently provided additional measures of free recall, availability, goodness, emotionality, and pronounceability for these same 925 nouns. Toglia and Battig (1978) greatly expanded the pool of available word norms with an ambitious listing of 2,854 words rated on the dimensions of concreteness, imagery, categorizability, meaningfulness, familiarity, number of attributes, and pleasantness. Additional lists of word norms have been published by Friendly, Franklin, Hoffman, and Rubin (1982) on measures of imagery, concreteness, orthographic variables, and grammatical usage for 1,080 common words and by Gilhooly and Logie (1980) on age of acquisition, imagery, concreteness, familiarity, and ambiguity for 1,944 words.

A natural outgrowth of the interest in mental imagery has been a curiosity about the nature of the imagery process in people who have experienced the world in the absence of one of the sensory modalities, for example, blind or deaf individuals. Researchers who have studied blind subjects have been interested both in whether imagery instructions and words with high imagery value result in better memory as they do for sighted subjects and in whether imagery modality affects memorability of items differently for the two subject populations.

Since word norms have been available only for sighted subjects, researchers have developed a variety of strategies for selecting appropriate items for use with blind subjects. Some researchers (e.g., Craig, 1973) have relied directly on sighted norms such as those developed by Paivio et al. (1968), while others (e.g., Jonides, Kahn, & Rozin, 1975) have selected items from those norms and asked their own subjects to rate the items on such characteristics as imagery modality. In an early study on the effect of imagery modality on memory for imaged items, Paivio and Okovita (1971) selected many of their items from Yuille and Barnsley's (1969) unpublished ratings of words based on ease of auditory, tactile, and visual imagery and added to them a number of items they judged to be easily imaged in either the auditory or visual modality. Subsequent researchers (e.g., Hans, 1974) have employed Paivio and Okovita's word lists, sometimes adding items based on Paivio et al.'s ratings and their own judgments of imagery modality (e.g., Zimler & Keenan, 1983). Marchant and Malloy (1984) selected items from Yuille and Barnsley's list and expanded on it by having additional words rated using the same procedures. Researchers concerned about the familiarity of words and

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their referents to the blind have selected items of high and low familiarity based on personal judgment and experience (Cornoldi, Calore, & Pra-Baldi, 1979; Cornoldi, DeBeni, Roncari, & Romano, 1989; Kerr, 1983), on judgments of blind assistants (Sholl & Easton, 1986), or on the judgments of teachers of the blind (DeBeni & Cornoldi, 1988).

The continued interest in mental imagery and cognitive processes in the blind, coupled with increasing concerns about the comparability of word meaning and familiarity for blind and sighted subjects, suggested to us the advisability of establishing a pool of words rated for normative values by both blind and sighted subjects. Because the number of totally congenitally blind subjects available for the rating task was limited, the rating procedures we employed were slightly different from those used in previous collections of normative values. All subjects rated all words on all dimensions, with blocked presentation and counterbalancing procedures to reduce the effect of one rating task on another. Normative values were collected only for the dimensions considered relevant by previous researchers interested in mental imagery and cognitive processes of blind subjects. Likewise, only words used in previous studies of the blind were included. A total of 161 nouns were rated by both blind and sighted subjects on the dimensions of familiarity, concreteness, meaningfulness, and imageability. The dominant modality of imagery and first associated word were also recorded.

METHOD

Subjects

Twelve (8 female, 4 male) college-educated blind adults, ranging in age from 33 to 49 years, were paid participants. All subjects were blind from birth or became blind within the first 2 years of life and reported no memory of visual experience. All were totally blind or had minimal light perception, and the causes of blindness were exclusive of cortical damage. Twelve (6 female, 6 male) sighted college-educated adults and current college students, ranging in age from 18 to 33, also participated for pay.

Materials

One hundred sixty-one nouns were selected from the items used in previous research studies on imagery in the blind (Jonides et al., 1975; Paivio & Okovita, 1971; Sholl & Easton, 1986; Zimler & Keenan, 1983). The nouns were arbitrarily divided into two lists, with the stipulation that related words such as *daybreak* and *daylight* appeared on different lists. Each list was recorded on tape in both alphabetical and reverse-alphabetical order to reduce potential order effects.

The instructions for rating the familiarity, concreteness, meaningfulness, and imageability of words were closely adapted from those used by Toglia and Battig (1978), with a scale of 1 to 7 used for all ratings. Following the instructions for rating the imageability of words, the sub-

jects received the following instructions for reporting the imagery modality.

Once you have given your rating for imagery on the 1 to 7 scale, I would then like you to judge the primary sensory modality of the mental image you created when you heard the word. In other words, was your mental image:

- (a) Visual: it was most like seeing it with your eyes
- (b) Auditory: it was most like hearing it with your ears
- (c) Tactile: it was most like touching it with your hands or another part of your body
- (d) Taste: it was most like tasting it on your tongue
- (e) Smell: it was most like smelling it with your nose
- (f) Spatial: you were most aware of the physical qualities such as size, shape, and position in space, but the image was not tied to a particular sensory system
- (g) or did the word arouse no mental imagery of any kind, as indicated by your rating of 1 on the 1 to 7 scale.

So, after hearing each word on tape, first give your rating for imagery on the 1 to 7 scale; and then give the primary sensory modality of your mental image, either visual, spatial, auditory, tactile, smell, or no mental imagery of any kind.

The following instructions for word association were presented along with the instructions for rating word familiarity.

I am also interested in the first related word that comes to your mind as you hear each of the words on tape. Therefore, the first thing you should do after hearing each taped word is to say the first word that comes to your mind. For example, when you hear the word "penny" you might immediately think of the word "coin." Please do not stop to reflect or select the associate word. There are no right or wrong answers, and we are interested in your most immediate association.

Procedure

Each experimental session began with the rating of word familiarity and production of word associates for all 161 nouns, since these seemed to be the two dimensions most likely to be affected by repeated exposure to the words. The experimenter read the instructions to the subject and answered any questions, then played the words on tape one at a time and recorded the subject's verbal response. The order of presentation of the subsequent three rating tasks was counterbalanced across subjects, as was the order of presentation of tapes. The subjects always heard the instructions and rated all 161 nouns on the relevant dimension before proceeding to the next task. The entire rating session lasted from 2–3 h.

Table 1
Number of Words for Which Blind or Sighted Subjects
Gave the Higher Rating

Group with Higher Rating	Rating Category			
	Familiar	Concrete	Meaningful	Image
Blind	155	87	68	80
Tie	2	4	7	0
Sighted	4	70	86	81

RESULTS

A summary of the ratings, word associates, and imagery modalities is presented in the Appendix. Correlation coefficients for the mean ratings of blind and sighted subjects on the 161 words were relatively high for the dimensions of concreteness (.86) and imageability (.84), but noticeably lower for familiarity (.56) and meaningfulness (.51). For the 80 items that appeared both on our list and on Toglia and Battig's (1978) list, correlation coefficients for familiarity and meaningfulness were .76 and .65 for our sighted subjects and .48 and .36 for our blind subjects. On the dimensions of concreteness and imageability, our subjects' mean ratings were correlated with those of Toglia and Battig, Paivio et al. (1968; 119 shared items), and Friendly et al. (1982; 38 shared items). For sighted subjects, the correlations were .92, .95, and .82 for concreteness and .80, .95, and .90 for imageability. For blind subjects, the correlations were .75, .93, and .61 for concreteness and .61, .86, and .66 for imageability.

The blind subjects had a strong tendency to rate the familiarity of the words with a higher scale value than sighted subjects. For only 4 of the 161 nouns did sighted subjects give a higher familiarity rating than did blind subjects (*mast, mirror, painting, rainbow*), and ratings were tied for only 2 (*sky, sunset*). Relative scale values for the two subject groups were more similar for the other three rating scales (see Table 1).

DISCUSSION

Blind and sighted subjects in our study were more consistent with each other in their ratings of concreteness and imageability of words than in their ratings of familiarity and meaningfulness. The low correlations for the latter two dimensions probably reflect in part the differences in the reliability of ratings on these dimensions in general. Belleza, Greenwald, and Banaji (1986), for example, reported correlation coefficients very similar to those for our sighted subjects for familiarity (.72) and imageability (.85) when they correlated their ratings with those of Toglia and Battig (1978). However, the familiarity and meaningfulness correlations for our blind subjects both with our sighted subjects and with Toglia and Battig's sighted subjects were considerably lower than the correlation between the two groups of sighted subjects. This fact suggests that visual experience contributes to these ratings and that blind and sighted subjects differ in their judgments of familiarity and meaningfulness.

The overall tendency for the blind subjects to rate items higher than the sighted subjects on the familiarity scale but not on the other three scales may result from the auditory presentation of the words. Since the auditory modality is more predominant for blind subjects than for sighted subjects, it is possible that the *sounds* of words appear more familiar to blind people who hear them frequently than to sighted people who frequently read them without attending to their phonetic qualities. There is nothing in the data to suggest that words that were rated especially high in familiarity by the blind subjects as compared with the sighted subjects differed systematically in their other scale values. Some words (e.g., *goblet, growl*) showed values on all scales that were higher for the blind subjects than for the sighted subjects. Others (e.g., *animosity, devotion*) were higher for the blind subjects only on the familiarity dimension, with similar values for the blind and sighted subjects on the other three scales. The most puzzling cases were relatively high for the blind subjects on familiarity but relatively low (e.g., *maiden*) or mixed (e.g., *meadow*) on the other three scales.

Differences between the blind and sighted subjects on ratings of concreteness were based in part on the higher ratings given by blind subjects to words with a strong auditory connection. Of the 24 words that blind subjects gave a rating of 1 scale point or more higher than sighted subjects, 20 had a clear auditory component (*bang, beep, clang, click, conversation, echo, gong, groan, growl, hiss, laughter, pop, roar, scream, shout, snap, song, squeak, tone, whisper*). Auditory characteristics apparently also affected relative meaningfulness and imageability ratings for the blind and sighted subjects; 10 of 18 words with differences on the meaningfulness scale of 1 point or more referred to auditorily experienced items (*accordion, beep, clang, click, gong, growl, pop, rattle, roar, tone*), and 11 of 14 words on the imageability scale (*clang, conversation, gong, groan, pop, rattle, roar, shout, snap, whistle*).

One potentially surprising result in the selection of imagery modality was the use of the term *visual* by blind people to describe their imagery experience. We had included the term *spatial* as a modality choice to provide blind subjects with an alternative to the visual category. Yet, despite reminders from the experimenter that visual meant "like seeing it with your eyes," several blind subjects persisted in using the term to describe the imagery modality. For these subjects, whose daily experience includes terms such as "visualizing," "looking," or "seeing" with reference to their own experiences, the term *visual* is a natural one, probably much more natural than *spatial*. This use of the term *visual* by totally congenitally blind subjects to describe imagery experience has been noted by other researchers as well (e.g., Marchant & Malloy, 1984; Schlaegel, 1953). Yet, our blind subjects did not use the term *visual* as frequently as sighted subjects, and there appears to be a pattern in the kinds of items for which they selected the term *visual*. The word for which the largest number of blind subjects (50%) listed the visual modality was *headlight*, which might actually

have been experienced visually by those subjects who had had light perception at some time during their lives. The common denominator for words that received visual ratings from 42% of the blind subjects (*daylight, green*), 33% of the blind subjects (*daybreak, galaxy, painting, poster, scarlet, shadow, stain, star*), and 25% of the blind subjects (*acrobat, dawn, dragon, flag, hillside, juggler, meadow, mirror, portrait, rainbow, roof, sky, sunset, valley*) is that the distinctive physical characteristics of the words' referents can be experienced *only* through the visual sense. In contrast, there were many words that received predominantly visual ratings from the sighted subjects but for which no blind subject reported a visual image (e.g., *arm, ball, blossom, cane, cave, coin, flower, potato, singer, speaker, skillet*). All of these items probably had been experienced by the blind subjects through sensory modalities other than vision and were experienced imaginatively through the familiar nonvisual sense modalities. Thus it appears that the term "visual image" was reserved by the blind subjects for those items whose appearance they could imagine but with which they had no direct sensory experience. These items are likely to have been described to them in visual terms, making this the sensible choice for imagery modality.

It is also interesting to note that some words were strongly associated with "visual" words for the blind subjects as well as the sighted subjects. For example, *lightning* was strongly associated with *thunder*, *blue* with *sky*, *red* with *scarlet* and with *blood*, *green* with *meadow*, and *colors* with *rainbow*. This may help to explain why previous researchers (e.g., Zimler & Keenan, 1983) have found that color names serve as effective clustering categories for both blind and sighted subjects.

Despite the high correlations of the ratings of our subjects with those from previous normative samples, a word of caution is in order regarding both the generalizability and the variability of the data presented here. The norms were collected from a select subgroup of blind people who are college educated and totally congenitally blind. These criteria were selected as representing both maximal homogeneity in the critical area of visual experience and the population most frequently studied by researchers interested in the cognitive consequences of blindness. Limited populations, however, also mean limited availability of samples from those populations, and the sample size here is therefore small. Although there is little reason to believe that collecting additional data from comparable subjects would increase measures of variability (standard deviations), it is important to note that confidence intervals around our means are relatively large. Thus, particularly for items of intermediate scale value, researchers may wish to supplement the ratings given here with additional ratings given by their own subjects after they have participated in an experiment. However, this

caution is less applicable to those items most likely to be useful in subsequent research, namely items of relatively low or relatively high scale values.

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APPENDIX

The 161 nouns are listed in alphabetical order, followed by the mean score and below it by the standard deviation for the ratings of familiarity (f), concreteness (c), meaningfulness (m), and imagery (i). The percentage of subjects selecting each modality for imagery (visual, auditory, tactile, taste, spatial, or smell) and the two most frequent associates are presented following the ratings. Additional associates are included in the case of ties, and no associate is listed if there was lack of agreement between at least two subjects.

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Accordion	B	6.25 1.14	6.25 1.22	5.00 1.71	6.50 0.80	-	83	17	-	-	-	Instrument Music	42 33
	S	4.75 1.76	6.08 0.79	3.75 1.48	5.58 1.24	50	50	-	-	-	-	Instrument Monkey	25 17
Acrobat	B	6.08 1.16	4.58 2.23	3.42 1.73	4.00 1.86	25	17	17	-	25	-	Circus Gymnast	33 25
	S	5.00 1.60	5.50 1.45	4.25 1.06	5.58 1.24	100	-	-	-	-	-	Circus Gymnast	33 25
Affection	B	6.75 0.45	3.83 2.44	5.17 1.95	4.42 2.47	08	-	67	-	-	-	Love Feeling	50 17
	S	5.58 1.73	3.92 2.23	5.00 1.65	3.42 2.23	17	-	42	-	17	-	Love Care	42 25
Amplifier	B	5.92 1.16	6.00 1.54	4.33 1.78	5.33 2.23	-	75	08	-	-	-	Loud Speaker	25 25
	S	5.00 1.65	5.58 1.56	3.67 1.23	4.75 2.01	33	50	-	-	-	-	Music Speaker	25 17
Animosity	B	5.92 1.38	2.83 2.12	4.00 1.86	2.33 2.15	-	17	08	-	-	-	Anger Hate	25 25
	S	4.08 1.73	2.75 1.71	3.50 2.15	2.58 1.93	17	08	17	-	08	-	Anger Hate	25 25
Anxiety	B	6.50 0.67	3.75 2.26	4.25 1.91	2.50 2.35	-	17	-	-	17	-	Anxious Fear	25 17
	S	5.83 1.11	3.17 1.80	4.42 1.93	3.00 2.30	25	-	17	-	08	-	Attack Stress	25 25
Applause	B	6.42 0.90	5.92 1.00	5.50 1.24	6.33 1.07	-	100	-	-	-	-	Clap	92
	S	5.25 1.54	5.17 1.53	5.00 1.28	5.83 1.11	17	83	-	-	-	-	Clap Laughter	42 17

APPENDIX (Continued)

Noun	Subject Group	Modality (%)										Strongest Associates	%
		f	c	m	i	(v	a	tc	ts	sp	sm)		
Aptitude	B	6.17 1.27	2.33 1.78	3.58 1.56	2.17 2.12	-	08	-	-	08	-	Test Ability	33 17
	S	5.00 1.48	2.17 0.83	3.83 1.34	1.42 0.79	25	-	-	-	-	-	Ability Test	25 17
Arm	B	6.92 0.29	6.67 0.49	5.75 1.66	6.08 1.73	-	-	92	-	-	-	Leg Body Hand	25 17 17
	S	6.33 0.89	6.58 0.67	4.67 1.61	6.42 0.51	92	-	08	-	-	-	Leg	50
Atrocity	B	4.92 1.68	2.25 1.71	2.67 1.67	1.42 1.16	-	08	-	-	-	-	Bad Terrible	17 17
	S	4.42 1.38	2.42 1.08	4.42 1.98	3.17 2.44	50	08	-	-	-	-	Death	17
Avalanche	B	5.67 1.50	4.67 1.78	3.25 1.60	4.58 1.68	17	42	17	-	25	-	Snow Slide	25 17
	S	4.92 1.68	4.92 1.44	4.58 1.93	5.75 1.71	67	17	-	-	08	-	Snow Rocks	33 25
Bagpipe	B	5.83 1.53	6.50 0.80	4.42 1.88	6.42 1.24	-	100	-	-	-	-	Musical Instrument Scottish	33 33
	S	5.08 1.56	5.92 1.08	3.75 2.09	5.67 1.23	42	58	-	-	-	-	Scottish Music	33 17
Ball	B	6.58 1.00	6.33 0.98	5.33 1.87	6.33 0.89	-	08	75	-	17	-	Game	17
	S	6.17 0.83	6.00 0.95	5.58 1.68	6.42 0.79	75	08	08	-	08	-	Chain Play Round Toy	17 17 17 17
Bang	B	6.75 0.87	6.33 0.89	5.42 1.38	6.42 0.79	-	100	-	-	-	-	Gun Loud noise	50 42
	S	5.33 1.87	4.58 1.78	5.25 1.06	6.00 0.74	08	92	-	-	-	-	Gun	58
Beep	B	6.58 0.51	6.58 0.79	5.58 1.00	6.50 1.00	-	100	-	-	-	-	Horn Noise Sound	33 17 17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Candle	B	6.67 0.65	5.67 1.44	5.00 1.48	6.17 0.83	17	-	50	-	17	17	Light Wax	75 17
	S	6.17 0.83	5.83 1.11	4.83 1.75	5.92 1.24	83	-	08	-	-	08	Light Flame	42 17
Cane	B	6.75 0.45	6.25 1.48	4.50 1.73	5.75 1.71	-	-	83	-	08	-	Walk Stick	33 17
	S	5.33 1.30	5.50 1.09	4.25 1.48	5.67 1.15	83	-	08	-	08	-	Able Old Walk	17 17 17
Cave	B	6.08 1.38	5.50 1.51	3.92 1.78	5.25 1.66	-	17	42	-	42	-	Underground Cold Dark Man	25 17 17 17
	S	5.58 1.31	5.67 1.07	5.00 1.65	5.58 1.24	83	-	-	-	17	-	Bear Dark Man	33 17 17
Chance	B	6.67 0.89	2.17 1.75	4.00 1.88	2.17 1.99	-	17	-	-	08	-	Opportunity	25
	S	5.58 1.38	2.42 1.51	5.17 1.53	1.42 1.44	-	-	-	-	08	-	Opportunity Game Luck	25 17 17
Cigar	B	6.33 1.15	6.00 1.21	4.50 1.62	6.50 0.80	08	-	08	-	08	75	Smoke Cigarette	58 17
	S	5.50 1.62	6.42 0.79	5.00 1.48	6.42 0.79	50	-	-	-	-	50	Smoke Cigarette	67 25
Circle	B	6.67 0.78	5.33 1.56	4.83 1.59	5.58 1.88	08	-	33	-	50	-	Round Square	67 17
	S	6.00 0.85	3.75 1.54	4.25 2.05	6.25 0.87	75	-	-	-	25	-	Square Round Shape	33 17 17
City	B	6.50 1.17	5.33 1.92	5.42 1.78	5.17 1.80	17	25	08	-	42	-	Town Atlanta	33 25
	S	6.42 0.67	6.17 0.83	6.08 0.90	6.17 0.72	83	08	-	-	08	-	State Atlanta	25 17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Clang	B	6.42 0.79	6.58 0.79	5.08 1.78	6.50 0.90	-	100	-	-	-	-	Bell Metal Noise	50 17 17
	S	4.75 1.71	3.67 1.83	4.08 1.56	5.42 1.56	-	100	-	-	-	-	Bell Noise	25 17
Click	B	6.58 0.67	6.17 1.19	5.83 1.40	6.42 0.79	-	100	-	-	-	-	Noise Clock	42 17
	S	4.92 1.98	5.08 1.16	4.42 1.31	5.75 1.06	08	92	-	-	-	-	Groups	33
Clock	B	6.83 0.39	6.58 0.79	5.67 0.89	6.58 0.67	-	67	33	-	-	-	Time	50
	S	6.25 0.97	6.08 0.79	5.42 1.31	6.08 1.16	50	50	-	-	-	-	Time Tick	33 25
Clown	B	6.42 1.16	5.25 2.09	4.92 1.51	5.67 1.30	17	25	25	-	17	-	Circus Funny Laughter	50 17 17
	S	5.67 1.67	6.08 0.67	5.42 1.31	6.33 0.65	100	-	-	-	-	-	Circus	25
Coin	B	6.75 0.45	6.58 0.90	6.25 0.75	6.67 0.65	-	-	100	-	-	-	Money Penny	58 17
	S	6.50 0.52	6.25 0.97	5.42 1.51	6.50 0.67	67	-	33	-	-	-	Money Penny	33 33
Competence	B	6.33 0.98	2.25 1.60	3.83 1.95	2.25 2.30	-	08	-	-	08	-	Ability	42
	S	5.17 1.58	2.33 1.50	4.42 1.31	1.92 1.56	17	-	-	-	17	-	Ability	42
Concept	B	6.33 0.89	3.17 2.48	3.67 2.15	2.33 2.02	08	-	-	-	08	08	Idea	67
	S	5.50 1.17	1.83 0.94	3.83 1.47	1.58 1.24	08	-	-	-	17	-	Idea	58
Confidence	B	6.42 1.00	2.42 1.68	4.17 1.75	2.33 2.42	-	08	-	-	-	-	Self/Self Image	17
	S	5.92 0.67	2.83 1.64	4.42 1.88	2.75 2.30	33	-	08	-	08	-		

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Conversation	B	6.75 0.45	6.08 1.24	5.25 1.60	6.00 1.48	-	100	-	-	-	-	Talking	83
	S	5.92 0.90	3.92 2.15	5.33 1.37	4.92 1.88	25	67	-	-	08	-	Talking	67
Cooperation	B	6.58 0.79	2.92 1.73	4.33 1.78	2.33 2.42	-	08	-	-	08	-	Togetherness Going along	25 17
	S	5.58 1.08	2.50 1.57	5.00 1.86	2.58 2.07	42	-	-	-	08	-	Help	42
Corner	B	6.25 0.75	4.75 1.82	3.83 1.90	5.17 1.80	17	-	25	-	50	-	Street	25
	S	5.58 1.38	5.42 1.31	4.42 1.73	5.25 1.29	100	-	-	-	-	-	Edge Room	17 17
Cottage	B	6.25 1.06	5.83 1.27	4.08 1.88	5.58 1.51	17	-	42	-	42	-	House Home	42 17
	S	5.42 1.44	5.75 0.97	4.17 1.75	5.83 1.19	100	-	-	-	-	-	House Cheese	58 17
Cough	B	6.67 0.65	6.25 1.06	5.83 0.83	5.75 2.09	-	67	17	-	-	-	Cold Sneeze	50 17
	S	6.08 1.00	5.75 1.14	5.42 1.51	6.08 0.79	08	58	33	-	-	-	Cold Sneeze	33 25
Custom	B	6.25 1.06	2.67 2.15	3.92 1.88	1.83 1.99	08	-	-	-	-	-	Traditions Habit	50 17
	S	5.08 1.38	2.83 1.34	3.17 1.47	2.83 2.17	42	08	-	-	-	-		
Dawn	B	6.42 1.51	5.33 1.87	4.92 1.83	4.33 2.31	25	08	-	-	33	-	Early Morning	25 17
	S	5.92 1.24	5.42 1.24	5.50 1.00	5.75 1.14	100	-	-	-	-	-	Day Daylight Morning	17 17 17
Daybreak	B	6.17 1.27	4.67 2.06	3.42 2.02	4.67 2.19	33	25	-	-	08	08	Dawn Morning	50 17
	S	5.33 1.23	5.58 1.16	4.75 1.66	5.42 1.31	100	-	-	-	-	-	Morning Sunrise/Set	25 25

APPENDIX (Continued)

Noun	Subject Group	Modality (%)										Strongest Associates	%
		f	c	m	i	(v	a	tc	ts	sp	sm)		
Daylight	B	6.58	5.33	4.67	5.00	42	08	08	-	17	-	Dark Dawn	25
		1.16	2.06	1.78	2.30								17
	S	5.75	5.58	5.50	6.00	92	-	08	-	-	-	Living Night Sunshine	17
		1.48	1.38	1.09	0.95								17
Democracy	B	6.42	2.50	4.50	1.83	-	08	-	-	17	-	Government America	42
		0.79	1.83	1.73	1.40								25
	S	5.58	2.67	5.08	2.50	25	-	-	-	17	-	America Government	17
		1.31	0.98	1.44	2.15								17
Devotion	B	6.75	2.58	4.17	2.17	-	08	-	-	17	-	Devoted Loyalty Prayer	17
		0.45	1.62	1.99	2.04								17
	S	5.08	2.83	4.83	2.25	08	-	-	-	17	-	Love	42
		1.24	1.99	1.80	2.30								
Diamond	B	6.42	5.83	4.92	6.00	08	-	83	-	08	-	Ring Jewel Jewelry	33
		0.67	1.75	1.51	1.28								17
	S	5.67	6.25	4.92	6.17	83	-	17	-	-	-	Ring Stone	17
		1.37	0.75	1.83	0.94								17
Discretion	B	6.08	2.75	3.08	2.33	-	17	-	-	08	-	Cautious Judgment	25
		1.00	1.91	2.02	2.19								17
	S	4.83	2.08	4.17	1.50	17	-	-	-	-	-	Parental Secrecy	17
		1.40	1.00	1.75	1.17								17
Doll	B	6.83	6.50	5.67	6.58	-	-	92	-	08	-	Plaything House	33
		0.39	0.90	1.30	0.79								25
	S	5.67	5.92	5.17	5.92	92	-	08	-	-	-	House Child Toy	25
		1.50	1.08	1.80	1.16								17
Dragon	B	6.00	4.58	3.33	3.50	25	17	17	-	17	-	Fire Monster	33
		1.48	2.27	1.97	2.15								25
	S	4.83	4.33	4.75	5.50	100	-	-	-	-	-	Fire	33
		1.80	1.92	1.48	1.24								
Echo	B	6.33	6.42	4.17	5.75	-	92	-	-	08	-	Sound/Noise Mountains	25
		1.15	0.79	1.90	1.66								17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Elephant	S	5.00	4.83	3.92	5.25	08	83	-	-	08	-	Canyon	33
		1.71	1.90	1.68	1.29								
	B	6.17	6.25	4.92	6.08	08	17	58	-	17	-	Animal Trunk Zoo	25
		1.11	1.29	1.83	1.24								17
													17
	S	5.83	6.33	4.58	6.33	100	-	-	-	-	-	Big Large Tusk	17
		1.27	0.77	2.19	0.65								17
Engine	B	6.17	6.00	5.08	5.25	08	67	17	-	-	-	Car Motor Train	42
		1.47	1.60	1.38	1.91								17
	S	5.67	6.33	5.25	5.42	50	50	-	-	-	-	Car Roar	25
		1.56	0.78	1.36	1.08								17
	B	5.92	2.75	2.75	1.75	-	08	-	-	08	08	Perfume	17
		1.31	2.14	1.71	1.48								
Explosion	S	4.50	2.50	3.42	3.25	08	-	-	-	08	33	Smell Experience	33
		1.73	1.09	1.62	2.53								17
	B	6.50	6.58	4.58	6.00	-	92	08	-	-	-	Fire Noise/Sound	17
		0.90	0.79	1.68	1.21								17
	S	5.58	5.83	5.25	6.08	33	67	-	-	-	-	Bomb Boom	42
		1.24	1.27	1.60	1.00								17
Fallacy	B	5.83	2.83	3.08	1.67	-	08	-	-	-	-	Falsehood	25
		1.19	2.17	1.68	1.61								
	S	4.33	1.75	3.42	1.33	-	08	-	-	-	-	False Wrong	58
		1.72	0.87	1.51	0.89								17
	B	6.08	2.25	2.67	1.67	-	-	-	-	08	-	Destiny	42
		1.00	1.76	1.50	1.61								
Fate	S	5.42	2.17	3.75	1.17	-	-	-	-	08	-	Destiny	42
		1.16	1.27	1.82	0.58								
	B	6.58	5.58	5.33	6.00	25	-	58	-	17	-	American	33
		0.90	1.16	1.15	1.28								
	S	6.00	5.83	4.92	5.67	92	-	08	-	-	-	American Pole	25
		1.21	1.19	1.44	0.89								17

APPENDIX (Continued)

Noun	Subject Group	Modality (%)										Strongest Associates	%
		f	c	m	i	(	v	a	tc	ts	sp	sm)	
Flower	B	6.67	6.17	5.83	6.42	-	-	58	-	-	42	Bloom Pretty	17
		0.65	0.83	0.94	0.67								17
	S	6.08	6.25	5.92	6.33	83	-	-	-	-	17	Rose Plant Pretty	25
		1.44	1.06	1.24	0.89								17
Fork	B	7.00	6.58	6.25	6.75	-	-	92	-	08	-	Eat/Eating Knife Utensil	33
		0.00	0.79	1.14	0.62								17
	S	6.67	6.67	5.17	6.33	83	-	08	08	-	-	Spoon Utensil	33
		0.65	0.65	1.27	0.89								25
Galaxy	B	5.92	4.25	3.42	3.67	33	-	08	-	33	-	Stars Space	42
		1.24	2.38	1.98	2.10								17
	S	5.25	5.08	4.92	5.67	50	-	-	-	50	-	Star Universe	25
		1.54	1.24	1.98	1.30								25
Glory	B	6.50	2.92	3.58	2.58	08	08	08	-	08	-	Honor	25
		0.52	1.98	2.07	2.39								
	S	5.17	2.83	4.75	2.17	33	-	-	-	-	-	God Honor	17
		1.34	1.75	1.48	2.04								17
Goblet	B	6.42	6.58	4.92	6.25	-	-	83	-	17	-	Glass Drink Wine	42
		1.00	0.67	1.98	1.36								17
	S	4.75	5.83	3.75	5.08	92	-	08	-	-	-	Wine Glass	33
		1.54	1.19	1.48	1.38								17
Gong	B	6.33	6.50	5.00	6.33	-	100	-	-	-	-	Bell Noise	25
		0.98	1.00	1.91	1.23								25
	S	4.92	5.08	3.50	5.00	17	83	-	-	-	-	Show Bang	50
		1.62	1.38	0.67	1.35								17
Green	B	6.33	4.25	4.33	3.42	42	-	08	-	08	-	Grass Color	58
		1.72	2.38	2.02	2.50								17
	S	6.08	5.00	5.83	5.92	100	-	-	-	-	-	Blue Grass	25
		0.79	2.22	1.11	1.31								25
Groan	B	6.42	6.33	4.00	5.92	-	100	-	-	-	-	Moan	17
		0.90	0.78	1.76	1.56								
	S	5.50	5.25	4.50	4.92	33	67	-	-	-	-	Moan Pain	25
		1.38	1.14	1.17	1.44								17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Growl	B	6.83 0.39	6.42 0.90	5.67 1.23	6.67 0.65	-	100	-	-	-	-	Dog Animal	33 17
	S	5.00 1.71	5.00 1.60	4.42 1.56	5.75 1.14	-	100	-	-	-	-	Dog	33
Gun	B	6.42 1.00	6.33 1.07	5.25 1.60	6.17 1.03	08	67	25	-	-	-	Bullet Shoot Weapon	17 17 17
	S	6.08 0.90	6.42 0.51	5.08 1.38	6.25 0.97	67	25	08	-	-	-	Shoot Weapon	33 17
Harp	B	6.33 1.15	6.08 1.44	4.75 1.76	6.25 1.06	-	92	08	-	-	-	Instrument Music String	33 17 17
	S	4.75 1.54	5.50 1.24	4.83 1.40	5.33 1.30	42	58	-	-	-	-	Instrument Angel	33 17
Headlight	B	6.50 0.90	5.58 1.78	4.67 1.87	5.58 1.51	50	-	33	-	17	-	Car	67
	S	5.83 1.11	6.33 0.89	4.50 2.02	6.25 0.75	100	-	-	-	-	-	Car	58
Hill	B	6.42 0.79	5.75 1.54	4.75 1.76	5.17 1.75	08	-	25	-	58	-	Mountain High	25 25
	S	6.00 1.04	5.67 1.37	4.92 1.56	6.17 0.72	100	-	-	-	-	-	Mountain	17
Hillside	B	6.08 1.24	5.50 1.83	4.67 1.23	5.17 1.90	25	-	17	-	50	-	Grass Mountains	17 17
	S	5.17 1.53	5.67 1.37	5.00 1.21	5.83 1.27	92	-	-	-	08	-	Valley Mountains	25 17
Hiss	B	6.42 1.00	6.17 1.03	4.83 1.53	6.33 0.89	-	100	-	-	-	-	Snake Cat	42 33
	S	5.50 1.24	4.92 1.38	4.50 1.68	5.42 1.16	17	83	-	-	-	-	Snake Cat	75 17
Honk	B	6.00 1.54	5.92 1.78	4.17 2.21	5.00 2.34	-	75	-	-	-	-	Horn	58
	S	5.33 1.67	5.00 1.41	4.50 1.57	5.58 1.24	17	83	-	-	-	-	Horn	50

APPENDIX (Continued)

Noun	Subject Group					Modality (%)						Strongest Associates	%
		f	c	m	i	(v	a	tc	ts	sp	sm)		
Honor	B	6.50 0.67	3.00 2.00	4.17 1.85	2.33 2.27	-	08	-	-	17	-		
	S	5.42 1.56	2.17 0.83	5.08 1.56	2.58 2.39	33	-	-	-	-	-	Glory	33
Hound	B	6.67 0.49	5.08 1.98	4.33 2.06	4.75 2.45	08	25	25	-	08	08	Dog	75
	S	5.25 1.96	4.58 1.88	4.67 1.92	4.92 2.15	67	08	08	-	-	-	Dog	58
Icebox	B	6.58 0.51	6.17 1.34	5.00 1.54	6.33 0.98	08	17	67	-	08	-	Refrigerator	92
	S	5.08 1.83	6.00 0.85	4.58 1.62	5.67 1.07	58	-	33	-	08	-	Cold Freezer	33 25
Ignorance	B	6.33 0.78	2.58 2.02	4.08 2.11	2.33 2.42	-	17	-	-	-	-	Dumb Bliss	42 25
	S	5.25 1.60	2.25 1.66	4.83 1.53	2.08 1.88	33	-	-	-	-	-	Stupidity Bliss	50 25
Intellect	B	6.58 0.67	2.33 1.61	4.00 1.81	1.83 1.75	-	-	-	-	25	-	Intelligence	42
	S	5.08 1.38	2.17 1.19	5.58 1.44	1.58 1.16	17	08	-	-	-	-	Smart Intelligence Knowledge	25 17 17
Joy	B	6.83 0.39	3.08 2.11	4.58 1.62	3.50 2.84	-	25	08	-	08	-	Happy Sorrow	58 17
	S	5.92 1.38	3.25 1.82	5.50 1.38	3.33 2.31	42	08	08	-	08	-	Happy Laughter	58 17
Juggler	B	6.00 1.13	5.00 1.86	4.25 1.82	4.50 2.67	25	08	33	-	17	-	Circus Balls	33 25
	S	5.17 1.64	5.25 0.87	4.08 1.08	5.75 0.87	100	-	-	-	-	-	Circus Clown	33 17
Jury	B	6.42 0.80	5.00 2.41	4.92 1.62	4.25 2.67	17	33	-	-	17	-	Trial Court/Room	42 33
	S	5.50 1.38	5.50 1.17	4.92 1.51	5.50 0.80	100	-	-	-	-	-	Duty Trial	25 25

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Kerchief	B	5.50 1.57	5.33 1.72	4.00 1.54	5.17 1.40	17	-	83	-	-	-	Handkerchief Scarf	42 25
	S	3.67 1.83	4.92 1.98	3.00 1.65	4.75 2.14	75	-	08	-	-	-	Handkerchief Hat	25 17
King	B	6.58 0.90	5.25 1.91	5.00 1.54	3.67 2.71	17	17	08	-	17	-	Queen Throne	50 17
	S	5.58 1.38	5.33 1.44	5.25 1.54	5.67 1.07	100	-	-	-	-	-	Queen	83
Knowledge	B	6.58 0.67	2.67 2.15	4.58 1.93	2.42 2.57	-	08	-	-	17	-	Information	17
	S	5.67 1.15	2.58 1.08	5.42 1.62	1.75 1.86	17	-	-	-	-	-	Intelligence Smart	33 17
Landscape	B	6.00 1.35	5.58 1.73	4.17 1.70	5.17 1.90	17	-	17	-	50	08	Trees	17
	S	5.08 1.73	5.42 1.56	5.17 1.19	5.67 1.15	92	-	-	-	08	-	Drawing/ Painting Garden	17 17
Laugh	B	6.83 0.39	5.67 1.50	5.67 1.07	6.08 1.08	08	92	-	-	-	-	Funny Cry Joy	25 17 17
	S	6.33 0.78	5.67 1.07	5.50 1.31	5.83 1.11	08	83	-	-	08	-	Cry	42
Laughter	B	6.75 0.62	6.33 1.16	5.75 1.06	5.92 1.51	-	100	-	-	-	-	Happiness Tears	33 25
	S	6.25 0.87	5.33 1.16	5.17 1.40	5.83 1.03	08	83	08	-	-	-	Happiness Tears	25 17
Lemon	B	6.67 0.65	6.58 0.67	5.42 1.44	6.58 0.67	-	-	25	58	-	17	Fruit Peel	50 17
	S	5.67 1.37	6.17 0.94	5.00 1.60	5.92 1.00	50	-	-	50	-	-	Peel Car	33 25
Love	B	7.00 0.00	3.33 2.31	5.50 1.38	3.67 2.81	-	08	25	-	08	-	Hate Affection	25 17
	S	6.58 0.67	4.08 2.02	5.92 1.08	2.75 2.14	17	-	17	-	17	-	Hate Cherish	50 17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Maiden	B	6.25 1.06	4.92 2.15	3.75 1.82	3.50 2.54	17	08	25	-	08	-	Single/ Unmarried Voyage	25 25
	S	4.33 2.02	5.17 1.53	3.83 1.12	5.17 1.64	92	-	08	-	-	-	Fair	17
Mast	B	4.83 1.95	5.08 2.07	3.92 1.78	4.58 1.83	17	-	42	-	33	-	Ship Sail	33 25
	S	5.00 1.95	5.58 1.24	4.17 1.80	5.25 1.42	92	-	08	-	-	-	Ship Boat	42 25
Meadow	B	6.25 1.14	5.50 1.68	4.58 1.51	5.67 1.37	25	-	17	-	50	08	Green	17
	S	4.75 1.75	5.08 1.44	5.42 1.38	5.75 1.34	100	-	-	-	-	-	Field Prairie	17 17
Memory	B	6.92 0.29	3.58 2.50	4.92 1.73	2.75 2.53	-	17	-	-	17	-	Remember/ Recall Brain	25 17
	S	5.58 1.31	2.75 1.71	5.00 1.28	2.50 2.32	17	-	-	-	25	-	_____	
Mirror	B	5.92 1.56	4.92 2.43	4.42 1.93	5.08 2.02	25	-	42	-	25	-	Glass Image	42 17
	S	6.08 1.16	6.17 0.94	4.42 1.62	6.25 0.97	100	-	-	-	-	-	Reflection	33
Misconception	B	6.33 0.89	2.50 1.83	3.58 1.83	2.08 2.07	-	08	-	-	08	-	Misunder- standing	33
	S	4.42 1.93	2.08 1.08	4.08 1.88	1.42 1.16	-	-	-	-	08	-	Wrong	33
Monk	B	6.42 1.00	5.00 2.00	3.50 1.51	4.25 2.45	17	17	17	-	25	-	Monastery Priest	42 17
	S	4.58 1.78	5.75 1.06	4.33 1.37	5.83 0.94	100	-	-	-	-	-	Priest Monastery	33 17
Mountain	B	6.33 1.15	5.83 1.40	5.00 1.28	5.67 1.44	17	-	25	-	58	-	High	25
	S	5.75 1.36	6.25 0.87	5.08 1.51	6.33 0.65	100	-	-	-	-	-	Peak	25

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Music	B	6.83 0.39	6.50 0.80	6.17 0.72	6.75 0.45	-	100	-	-	-	-	Piano Melody Singing	25 17 17
	S	6.67 0.65	5.75 1.42	6.33 0.89	6.08 1.00	08	92	-	-	-	-	Rock Sound	17 17
Musician	B	6.75 0.45	6.58 0.67	5.67 1.72	5.17 2.33	-	75	-	-	08	-	Piano Pianist	17 17
	S	5.75 1.66	5.75 0.87	5.58 0.90	5.67 1.23	50	50	-	-	-	-	Singer	25
Necessity	B	6.83 0.39	2.42 1.62	4.58 1.93	2.17 2.33	-	08	-	-	08	-	"have to" Essential	25 17
	S	5.25 1.36	1.92 1.08	4.58 1.38	2.08 1.83	17	-	-	-	08	-	Need Food	50 17
Obsession	B	6.25 0.97	2.33 1.72	3.08 1.62	2.00 2.13	-	-	08	-	08	-	_____	
	S	5.17 1.34	2.75 1.71	4.25 2.01	2.67 2.19	08	-	17	-	08	17	Possession	17
Ocean	B	6.92 0.29	6.25 0.87	5.58 1.38	6.17 0.94	-	50	33	-	08	08	Sea Waves	33 25
	S	6.17 1.19	6.25 0.75	6.08 0.79	6.58 0.51	50	25	17	-	08	-	Sea	17
Orange	B	6.67 0.89	6.33 1.07	5.58 2.02	6.17 1.70	08	-	17	58	-	08	Fruit	58
	S	6.08 1.16	5.42 1.83	5.42 1.24	6.33 0.49	67	-	08	25	-	-	Apple Color Fruit	33 17 17
Orchestra	B	6.33 0.98	6.58 0.79	6.00 0.95	6.25 1.22	-	100	-	-	-	-	Music Symphony	33 33
	S	5.42 1.56	5.75 1.06	5.50 1.17	5.67 1.23	33	67	-	-	-	-	Music	25
Painting	B	6.17 1.47	5.00 1.86	4.67 1.92	4.25 2.42	33	-	25	-	08	08	Picture Portrait	42 25
	S	6.25 0.87	5.83 1.27	5.08 1.31	5.92 1.00	92	-	08	-	-	-	Art Artist	17 17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Palace	B	5.83 1.90	5.08 2.23	4.33 1.67	5.33 1.44	17	-	33	-	50	-	King Castle Mansion	25 17 17
	S	5.25 1.86	5.75 1.22	5.00 1.76	5.58 1.38	100	-	-	-	-	-	Castle	33
Pencil	B	6.50 1.17	5.58 1.93	5.08 1.68	6.25 0.97	08	08	83	-	-	-	Writing Paper	58 17
	S	6.42 1.08	6.50 0.80	5.67 1.23	6.42 1.00	67	-	33	-	-	-	Pen Writing Erasure	42 17 17
Pop	B	6.75 0.45	6.50 0.90	5.50 1.24	6.58 0.90	-	75	-	-	-	08	Corn Sound	42 17
	S	5.33 1.61	4.83 1.53	4.17 1.75	5.33 1.72	08	75	-	08	-	-	Weasel Soda	25 17
Portrait	B	6.08 1.44	4.83 2.44	4.42 2.02	4.67 2.35	25	-	33	-	17	-	Picture Painting	42 17
	S	5.08 1.62	5.67 1.15	5.33 1.44	6.17 0.83	100	-	-	-	-	-	Painting Lady	33 17
Poster	B	6.17 1.19	5.08 2.19	4.17 2.12	4.67 2.10	33	-	42	-	08	-	Picture	50
	S	5.42 1.68	5.92 0.67	4.67 1.50	6.00 1.21	100	-	-	-	-	-	Board Picture	42 17
Potato	B	6.83 0.39	6.58 0.67	5.67 1.30	6.92 0.29	-	-	58	42	-	-	Vegetable	25
	S	5.83 1.27	6.42 0.67	4.67 1.44	6.33 0.78	67	-	-	33	-	-	Head Fries	42 17
Prairie	B	6.00 1.04	5.33 1.83	4.25 1.66	4.83 1.80	17	17	17	-	42	-	Dog Grass	25 25
	S	4.83 1.85	5.25 1.14	5.33 1.15	5.42 1.08	100	-	-	-	-	-	Dog	58
Prestige	B	6.25 0.87	2.92 1.78	4.00 1.86	2.25 2.14	-	-	08	-	17	-	Pride	25
	S	4.75 1.60	2.50 1.09	3.92 1.38	1.83 1.53	17	-	-	-	08	-	Honor	42

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Pride	B	6.50 0.90	2.25 1.60	4.08 2.11	2.42 2.57	-	08	-	-	08	-	Proud	25
	S	5.25 1.71	2.75 1.66	4.50 1.88	2.25 2.05	08	-	08	-	17	-	_____	
Professor	B	6.50 0.67	5.50 1.73	5.42 1.38	4.92 2.15	08	58	17	-	-	-	Teacher College	42 25
	S	5.75 1.66	5.75 1.22	5.50 1.31	5.25 1.14	83	17	-	-	-	-	Teacher Instructor	42 17
Railroad	B	6.42 0.90	5.83 1.80	5.25 1.54	5.67 1.87	08	33	25	-	25	-	Train	67
	S	5.58 1.44	6.00 0.95	5.17 1.47	6.00 0.85	83	17	-	-	-	-	Train Car Ties Tracks	25 17 17 17
Rainbow	B	5.92 1.73	3.92 2.71	3.67 1.87	3.17 2.17	25	-	-	-	25	-	Colors Beauty	50 25
	S	6.00 0.95	5.67 1.44	4.83 1.80	6.08 1.08	100	-	-	-	-	-	Colors	33
Rattle	B	6.58 0.67	6.42 0.90	5.58 1.16	6.33 0.98	-	92	08	-	-	-	Noise/Sound Snake	33 33
	S	5.17 1.80	5.50 1.24	4.50 1.78	5.33 1.15	17	83	-	-	-	-	Snake Baby	67 25
Roar	B	6.75 0.45	6.58 0.90	5.42 1.08	6.50 0.80	-	100	-	-	-	-	Lion Loud	33 25
	S	5.25 1.82	5.50 1.09	4.33 0.98	5.50 1.00	-	100	-	-	-	-	Lion	75
Roof	B	6.08 1.83	5.75 1.76	5.08 1.24	5.83 1.19	25	-	42	-	33	-	Top House	42 25
	S	5.92 1.16	5.58 1.51	4.67 1.61	5.42 1.24	75	-	08	-	17	-	House Head	33 17
Scarlet	B	5.92 1.73	3.67 2.35	3.75 1.82	3.17 2.29	33	-	-	-	08	-	Red O'Hara	50 33
	S	5.08 1.93	5.00 2.13	5.17 1.64	5.92 1.00	100	-	-	-	-	-	O'Hara Red	42 17

APPENDIX (Continued)

Noun	Subject Group	f	c	m	i	Modality (%)						Strongest Associates	%
						(v	a	tc	ts	sp	sm)		
Scream	B	6.75 0.45	6.67 0.65	5.00 1.60	6.08 1.51	-	100	-	-	-	-	Yell Loud	25 17
	S	5.58 1.24	5.42 1.31	5.50 0.90	5.92 1.00	08	92	-	-	-	-	_____	
Sensation	B	6.58 0.67	4.00 2.00	3.33 1.72	3.75 2.70	-	-	67	-	-	-	Feeling	50
	S	5.83 0.83	3.42 2.19	4.58 1.98	2.75 2.30	-	-	50	-	-	-	Feeling	67
Sentiment	B	5.92 1.08	2.33 1.67	2.92 1.78	2.42 2.57	-	-	08	-	08	-	Feeling	58
	S	4.58 1.68	2.58 1.31	3.83 1.75	2.00 1.60	25	-	08	-	08	-	Feeling	17
Shadow	B	6.17 1.40	4.58 2.64	3.58 2.11	3.83 2.66	33	08	-	-	08	-	Image	25
	S	5.50 1.38	4.75 1.60	4.58 1.73	5.25 1.54	100	-	-	-	-	-	Darkness	17
Shame	B	6.42 0.90	2.58 1.56	3.83 1.70	2.42 2.57	-	08	-	-	08	-	Embarrassed Regret	17 17
	S	5.25 1.36	3.00 1.60	4.58 1.93	3.00 2.45	17	-	17	-	17	-	Greed	17
Shoes	B	6.92 0.29	6.75 0.87	5.33 1.56	6.83 0.39	08	-	83	-	08	-	Feet Socks	58 25
	S	6.25 1.14	6.25 1.22	4.92 1.68	6.08 1.16	100	-	-	-	-	-	Feet	33
Shotgun	B	6.17 1.34	5.92 1.78	5.25 1.60	6.00 1.04	-	83	17	-	-	-	Weapon Hunting	25 17
	S	5.58 1.56	6.17 1.03	5.25 1.06	6.08 0.80	67	33	-	-	-	-	Blast Rifle	17 17
Shout	B	6.67 0.65	6.50 0.80	5.42 1.51	6.67 0.65	-	100	-	-	-	-	Loud Yell	42 33
	S	5.75 1.22	4.58 1.78	4.67 1.83	5.58 1.31	08	92	-	-	-	-	Yell Loud Scream	50 17 17

APPENDIX (Continued)

Noun	Subject Group	Modality (%)										Strongest Associates	%
		f	c	m	i	(v	a	tc	ts	sp	sm)		
Singer	B	6.83 0.39	6.50 0.90	6.25 0.62	6.17 1.80	-	83	08	-	-	-	Music	33
	S	6.00 1.13	5.58 1.16	5.42 1.38	5.67 1.15	58	42	-	-	-	-	Dancer Microphone	25 17
Situation	B	6.42 0.79	3.00 2.09	4.00 1.60	2.25 2.14	-	08	-	-	17	-	Circumstance Predicament	17 17
	S	5.83 0.94	2.33 1.56	3.42 1.44	1.42 1.16	-	-	-	-	08	-	Comedy	33
Skillet	B	6.67 0.65	6.67 0.49	5.75 1.71	6.58 0.67	-	-	100	-	-	-	Cook Cooking	17 17
	S	5.33 1.23	6.08 1.08	4.42 1.73	6.33 0.65	75	17	08	-	-	-	Pan Eggs	33 25
Sky	B	6.25 1.71	4.67 2.35	4.17 2.08	4.75 1.86	25	-	08	-	50	-	Blue	50
	S	6.25 0.97	5.33 1.44	4.92 1.51	6.25 0.75	100	-	-	-	-	-	Blue	58
Snake	B	6.33 0.98	5.75 1.54	5.58 1.56	5.50 1.45	17	-	67	-	17	-	Bite Reptile	17 17
	S	5.83 1.47	6.33 0.78	4.83 1.70	6.58 0.67	75	08	17	-	-	-	Grass Bite Slimy	25 17 17
Snap	B	6.50 1.00	6.42 0.67	4.92 1.31	6.42 0.79	-	100	-	-	-	-	Crackle Finger Pop	17 17 17
	S	5.67 1.23	4.83 1.53	4.42 1.44	5.25 1.54	33	67	-	-	-	-	Crackle Fingers	42 25
Sneeze	B	6.75 0.62	6.08 1.88	4.83 1.75	6.17 1.11	-	92	08	-	-	-	Cold Allergy Cough	50 17 17
	S	6.08 1.44	5.75 1.06	4.25 1.54	5.75 1.06	08	83	08	-	-	-	Cold Cough	33 33
Song	B	6.83 0.39	6.83 0.39	6.17 0.83	6.75 0.62	-	100	-	-	-	-	Music Dance Lyric Sing	25 17 17 17

APPENDIX (Continued)

Noun	Subject Group					Modality (%)						Strongest Associates	%
		f	c	m	i	(v	a	tc	ts	sp	sm)		
Teacher	B	6.83 0.39	5.92 1.56	5.75 1.06	5.17 2.44	08	67	-	-	08	-	Student	25
												Instructor	17
												Professor	17
												Pupil	17
	S	6.25 0.75	5.75 1.22	5.67 1.07	5.33 1.44	75	25	-	-	-	-	Professor	25
												Pet	17
Tendency	B	6.17 0.72	2.25 1.66	3.08 1.62	2.17 2.17	-	08	-	-	08	-	Inclined	17
												Prone	17
	S	5.17 1.34	1.83 0.58	4.17 1.40	1.33 0.89	08	-	-	-	08	-	Suicidal	17
Thunder	B	6.83 0.39	6.58 0.67	5.25 1.60	6.67 0.49	-	100	-	-	-	-	Lightning	58
												Loud	17
	S	6.00 0.95	5.92 1.24	5.00 1.54	6.00 0.85	-	92	08	-	-	-	Lightning	83
Tone	B	6.58 0.80	6.08 1.31	5.58 1.51	5.75 1.91	-	100	-	-	-	-	Sound	25
												Music	17
	S	5.58 1.24	4.00 1.81	4.17 1.95	5.25 1.42	-	100	-	-	-	-	Pitch	17
												Muscles	17
												Music	17
Tower	B	6.50 0.80	5.58 2.11	4.42 1.78	5.08 2.23	17	-	17	-	50	-	High	50
												Tall	33
	S	5.58 1.16	5.67 1.07	5.00 1.13	5.50 1.45	100	-	-	-	-	-	Building	25
												Pisa	17
Troops	B	6.25 0.97	4.92 1.98	4.67 1.50	4.83 2.17	08	50	-	-	25	-	Army	58
												March	17
												Military	17
	S	5.00 1.28	5.33 1.30	4.67 1.56	5.08 1.78	75	17	-	-	-	-	Army	50
												War	25
Trumpet	B	6.17 1.19	6.33 0.89	5.33 1.50	6.33 0.98	-	100	-	-	-	-	Instrument	42
												Blow	17
												Sound	17
	S	5.33 1.67	5.92 0.90	5.17 1.19	5.58 1.44	50	50	-	-	-	-	Instrument	17
												Player	17
Tweezers	B	6.17 0.83	5.75 1.42	5.17 1.19	6.08 1.24	08	-	92	-	-	-	Eyebrows	33

APPENDIX (Continued)

Noun	Subject Group						Modality (%)						Strongest Associates	%
		f	c	m	i	(	v	a	tc	ts	sp	sm)		
Valley	S	5.08	6.25	4.00	5.50	83	-	17	-	-	-	-	Pluck	42
		1.68	0.87	1.60	1.38									
	B	6.25	4.83	5.00	5.33	25	-	08	-	58	-		Mountain	33
		1.22	2.17	1.65	1.72								Hill	17
													Low	17
	S	5.17	5.33	4.75	5.58	92	-	-	-	08	-		Hills	25
		1.75	1.37	1.42	1.24								Death	17
													Mountain	17
Vapor	B	6.50	4.92	4.42	5.17	08	-	75	-	-	-		Water	33
		0.67	2.02	1.73	1.85								Gas	17
	S	5.42	4.50	3.92	4.58	42	-	08	-	17	25		Gas	25
		1.24	1.62	1.78	1.73								Action	17
													Mist	17
Virtue	B	6.25	2.08	3.25	1.92	-	-	-	-	08	-		Honesty	17
		0.75	1.68	1.76	2.15								Quality	17
	S	5.17	2.00	3.75	2.00	08	-	-	-	25	-		Honor	17
		1.47	0.95	1.66	1.91									
Whisper	B	6.67	6.08	5.25	6.25	-	100	-	-	-	-		Soft	42
		0.65	1.24	2.63	1.06								Quiet	17
	S												Secret	17
		5.92	5.08	4.92	5.42	-	100	-	-	-	-		Quiet	33
		1.16	1.51	1.16	1.31									
Whistle	B	6.75	6.33	5.42	6.58	-	100	-	-	-	-		Blow	25
		0.45	0.78	1.00	0.90								Police	17
	S	5.42	5.92	4.67	5.50	08	92	-	-	-	-		Blow	25
		1.62	1.08	1.07	1.00								Work	25
Wigwam	B	6.08	4.83	3.25	5.17	17	08	33	-	33	-		Indian	92
		1.16	2.04	2.26	1.70									
	S	4.33	5.83	4.58	5.83	100	-	-	-	-	-		Indian	50
		1.44	1.11	1.44	1.19								Teepee	17