

AN INVESTIGATION OF SEX DIFFERENCES IN WORD RATINGS ACROSS CONCRETE, ABSTRACT, AND EMOTION WORDS

Lisa M. Bauer

Pepperdine University

Jeanette Altarriba

University at Albany, State University of New York

Researchers have often overlooked the relationships between sex and ratings of word characteristics, such as concreteness, context-availability, imageability, and emotionality. The current study investigated whether or not sex differences exist in such ratings for abstract, concrete, and emotion words. The results indicated that females rated concrete words as more emotional in nature. However, sex differences did not emerge in the ratings of abstract and emotion words. These findings indicate that sex differences can be demonstrated both across word types and across scales; they also emphasize the need to revise the standard models of word processing and representation so as to address issues related to sex differences.

Research studies have often addressed sex differences in cognitive processes in terms of intellectual abilities, such as verbal, mathematical, and spatial expertise (e.g., Burton, Henninger, & Hafetz, 2005; Caplan, Crawford, Hyde, & Richardson, 1997; Cattaneo, Postma, & Vecchi, 2006). The results of these studies typically indicate that males perform better than females on tasks drawing upon spatial, mathematical, and mechanical skills. Females, on the other hand, typically perform better than males on verbal fluency, perceptual speed, and spelling tasks (Burns & Nettelbeck, 2005; Harshman, Hampson, & Berenbaum, 1983). Researchers have examined sex differences in cognitive abilities in terms of brain organization, finding that there is greater lateralization in adult males for verbal and spatial functions as compared with females (Harshman et al. 1983). However, researchers have not investigated whether males and females form similar mental representations with regard

This work was funded by a Faculty Research Award granted to the second author by the University at Albany, State University of New York. We are grateful to Noah Belanoff, Celena Martino, and Amy Stollery for their assistance with data collection. We also thank two anonymous reviewers and Jeffrey Johnson for helpful comments on a previous version of this paper.

Correspondence concerning this work can be sent to the first author at the Department of Psychology, Pepperdine University, 24255 Pacific Coast Highway, Malibu, California, 90263 or via electronic mail at Lisa.Bauer@pepperdine.edu.

to language. Sex differences may exist in both brain organization and in terms of the mental representation of various concepts. Although previous cognitive studies have investigated sex in relation to intelligence and brain lateralization, researchers interested in word representation and memory have failed to integrate sex variables into their studies. The purpose of the present study is to address this apparent void in the literature.

At a theoretical level, various models of word representation in memory have focused on the generic features of word representation across humans without specifying any differences that may exist as a function of sex. For example, models that employ the theory of spreading activation to explain how related words facilitate the processing of one another in priming tasks rarely, if ever, discuss how differences may emerge in their data as a function of sex (see Hunt & Ellis, 2004, for a discussion of extant models of word representation in human memory). If certain word types, and particularly those that represent emotion, bear differing characteristics or qualities depending upon the sex of the participant, then researchers should take this variable into account when formulating their experimental stimuli and drawing conclusions from their results. Perhaps certain word types, mental representations, and, specifically, features of those words, may be stored differently in human memory depending upon sex. The current work seeks to explore this possible difference, thereby informing models of word representation in memory and adding greater specificity to those models, as they attempt to capture how individuals encode, store, and retrieve words from memory.

A conventional way of investigating the representations of various word types is through the implementation of participants' ratings along different dimensions (see for example, Rubin & Friendly, 1986). By rating words according to their characteristic components, individuals can reveal the degree to which those words possess various qualities (e.g., emotionality, imageability, and pleasantness). Additionally, the features or components of words, as measured through word ratings, provide a way to describe the mental representation of those word types by capturing the degree to which word groups possess different, measurable qualities. Feature-based and distributed models of word representation in memory (e.g., de Groot, 1992, 1993) are better informed through the use of data derived from scales that measure the distinctiveness of different word classes, based on mean ratings. Published word norms include Paivio, Yuille, and Madigan's (1968) concreteness, imagery, and meaningfulness word ratings, Rubin and Friendly's (1986) availability, goodness, and emotionality word ratings, and Gilhooly and Logie's (1980) imagery, concreteness, familiarity, and ambiguity word ratings, just to name a few. Average ratings for separate word groups have been used to distinguish those groups on a variety of dimensions, and many of those findings have been repeatedly replicated with different exemplars from each word group and with different samples of participants (see Altarriba & Bauer, 2004, and Altarriba, Bauer, & Benvenuto, 1999, for further discussion).

The term "word type" refers to whether a word can be classified as a concrete, abstract, or emotion word. In rating scale studies, participants are asked to rate a set of words on a particular attribute (e.g., concreteness, context availability, emotionality, imageability). For example, a participant may be presented with a list of 10 concrete nouns and be asked to rate each word on an imageability scale which ranges from 1 to 7. The participant

would be informed that a rating of 1 would indicate difficulty in forming a mental image of the stimulus word's referent, whereas a rating of 7 would indicate ease in forming an image. Scales typically used in the literature include concreteness, context availability, imageability, and emotionality (e.g., Benjafield & Muckenheim, 1989; Campos, 1990; Campos & Astorga, 1988; Campos & Sueiro, 1991; de Groot, 1992; Friendly, Franklin, Hoffman, & Rubin, 1982; Paivio et al., 1968; Yuille, 1968). Concreteness scales typically ask participants to rate each word on a scale from abstract to concrete (e.g., Paivio et al., 1968). Context availability scales address how easy or difficult it is for the participant to recall a circumstance in which the meaning of the word would appear. Emotionality scales ask the participants to rate how emotional the word's meaning is, from "not at all emotional" to "very emotional."

Previous research has addressed sex differences for word attributes with ratings such as those just described. However, the results of the studies vary. Some studies have found no sex differences for concreteness (Campos, 1990; Friendly et al., 1982), imageability (Campos, 1990; Friendly et al., 1982), or emotionality (Campos, 1990; Campos & Gonzalez, 1992). In contrast, Benjafield and Muckenheim (1989) have demonstrated sex differences for some word attributes. They found that men provide significantly higher concreteness scores than women. They also reported that females provide significantly higher imageability scores than males (Benjafield & Muckenheim, 1989).

Although these studies provide no clear evidence for or against sex differences on word characteristics, different word types (i.e., abstract, concrete, emotion) may reveal the presence of sex differences on word attributes. The researchers of the aforementioned studies did not separate the words used in the experiments by word type, nor did they comment on which word types are included in the experiments. Additionally, previous researchers investigating sex differences have not included the context-availability scale in their studies.

Recent research by Altarriba and Bauer (2004) suggested that words should be separated by word type and that the context-availability scale should be included. Altarriba and Bauer asked 78 participants to rate the same abstract, concrete, and emotion words on one of three 7-point scales: concreteness, context-availability, and imageability. They found significant differences between all three word types on each scale. The results of their rating study indicated that concrete words are easier to image and easier to place into contexts, followed by emotion words and then by abstract words. On concreteness, concrete words received the highest ratings followed by emotion words, and then by abstract words. These findings suggest that abstract, concrete, and emotion words are processed differently. Although Altarriba and Bauer (2004) investigated only concreteness, context-availability, and imageability ratings, the present study includes an emotionality scale. It also examines possible sex differences. The addition of the emotionality scale is important because previous researchers (e.g., Paivio, 1971; Paivio et al., 1968; Yuille, 1968) found that words with an evaluative component (e.g., love, grief) were rated low on concreteness and high on imageability. These findings suggest that word types may differ in terms of concreteness, sensory experience (imageability), and affective experience (emotionality). The addition of an emotionality scale is also appropriate given that previous researchers failed to find sex differences for ratings on the emotionality scale (Campos, 1990; Campos & Sueiro, 1991). However, this failure to find

sex differences in emotionality could be due to the researchers' failure to analyze the data in terms of separate word types (i.e., abstract, concrete, and emotion). Thus, separate word groups should be examined on separate scales, for both males and females, for a complete picture of the representational characteristics of different word types in human memory.

The present study, therefore, combines the ideas behind the previously cited studies and examines whether there are sex differences in the ratings of abstract, concrete, and emotion words on concreteness, context-availability, imageability, and emotionality scales. Differences are predicted to emerge in the ratings of various word types, and particularly for concrete words, since these are more likely to be significantly correlated to higher imageability ratings—a factor that has been previously linked to sex differences in the literature (cf., Benjafield & Muckenheim, 1989).

Knowledge of the properties that characterize abstract, concrete, and emotion words gained from this study may facilitate the development of methods of reading and language acquisition, can be useful in mental health settings, and has implications for future research on sex differences in word representation.

Method

Participants

A total of 192 participants (96 males and 96 females) from the University at Albany, State University of New York took part in this study for partial fulfillment of a course requirement. Each participant was a native English speaker.

Materials

The abstract, concrete, and emotion words were classified a priori based on normative data (e.g., Friendly et al., 1982; Paivio et al., 1968) using the same classification procedure previous researchers used (e.g., Altarriba & Bauer; 2004; Altarriba et al., 1999; Bleasdale, 1987). Concrete words were operationally defined as words whose meanings denote something material and represent an actual thing. Abstract words were operationally defined as words whose meanings referred to something considered apart from some material object (and not classified as emotion words). To be classified as an emotion term, the word needed an affective meaning and pleasantness/unpleasantness arousal components. With these operational definitions, 144 words (48 abstract, 48 concrete, and 48 emotion words) were selected. The 48 concrete and abstract words were selected from Altarriba et al. (1999); Bleasdale (1987); Chiarello, Senehi, and Nuding (1987); and Nelson and Schreiber (1992). The 48 emotion words were selected from Altarriba et al. (1999); Clore, Ortony, and Foss (1987); Shaver, Schwartz, Kirson, and O'Connor (1987); and Whissell (1989; see the appendix). These three word types were matched in frequency and length. The words within each word type were randomized and typed into lists.

Procedure

An equal number of males and females were randomly assigned to

rate the stimuli on one of the following four 7-point scales: concreteness, imageability, context-availability, or emotionality. Here, 24 male participants and 24 female participants provided ratings on only a single scale. The scales ranged from "1" to "7," where a "1" indicated abstract, difficult to image, low context availability, or not at all emotional. A score of "7" indicated concrete, easy to form an image, high context availability, or emotional. The instructions for each scale included examples, thereby providing the participants with anchors for their ratings. All instructions used in this study are similar to those that previous researchers have used (e.g., Altarriba & Bauer, 2004; Altarriba et al., 1999; Campos, 1990; de Groot, 1992; Friendly et al., 1982; Gilhooly & Logie, 1980; Paivio et al., 1968; Schwanenflugal, Akin, & Luh, 1992). When participants are asked to rate different word types on a variety of scales, the attributes of these different word types and possible sex differences in word representation can be explored. Additionally, the findings may replicate the results of previous studies; e.g., concrete words are rated as more concrete and imageable than abstract words (e.g., Benjafield & Muckenheimer, 1989; Friendly et al., 1982; Gilhooly & Logie, 1980; Paivio et al., 1968; Rubin & Friendly, 1986; Toglia & Battig, 1978).

Results

Three separate 2×4 analyses of variance (ANOVAs) assessed effects of sex (male vs. female) and scale type (concreteness, context-availability, imageability, emotionality) on participants' ratings for each of the three word types (abstract, concrete, and emotion). Table 1 displays mean ratings.

Table 1
Mean Rating for Abstract, Concrete, and Emotion Words as a Function of Sex and Scale Type

Scale	Abstract	Concrete	Emotion
Context Availability			
M	4.48 (1.07)	5.33 (.99)	4.87 (1.11)
F	4.41 (.94)	5.17 (1.12)	4.80 (1.13)
Concreteness			
M	3.75 (.99)	5.94 (.97)	3.88 (1.17)
F	3.37 (.76)	6.18 (.89)	3.41 (.99)
Imageability			
M	3.01 (.99)	6.46 (.78)	4.80 (1.13)
F	2.51 (.82)	6.64 (.46)	4.87 (1.11)
Emotionality			
M	3.14 (.99)	1.55 (.46)	5.65 (.82)
F	3.42 (.76)	3.40 (.99)	5.92 (.90)

Note. Context-availability, concreteness, imageability, and emotionality ratings were on a scale from 1 to 7 (1 = low, 7 = high). Standard deviations are in parentheses.

For the abstract words, the ANOVA revealed a significant main effect of scale type: $F(3, 184) = 28.79$, $MSE = 23.86$, $\eta^2 = 0.319$, $p < .05$. This finding suggests that participants rate the words differently based on the attribute that a scale measures. Post hoc comparisons revealed significant differences in ratings between all possible pairs of scales except between concreteness and emotionality.

For the emotion words, the 2×4 ANOVA revealed a significant main effect of scale type: $F(3, 184) = 33.51$, $MSE = 36.90$, $\eta^2 = 0.35$, $p < .05$. Post hoc comparisons revealed a significant difference in ratings between all possible pairs of scales except between context availability and imageability.

For the concrete words, the results are as follows: a significant main effect of scale type, $F(3, 184) = 213.43$, $MSE = 159.01$, $\eta^2 = 0.77$, $p < .01$; a significant main effect of sex, $F(1, 184) = 17.81$, $MSE = 13.27$, $\eta^2 = 0.08$, $p < .01$; and a significant interaction $F(3, 184) = 13.22$, $MSE = 9.85$, $\eta^2 = 0.18$, $p < .01$. Planned comparisons revealed that the ratings on all the scales were significantly different from each other. The significant main effect of sex revealed that across scale types, females ($M = 5.35$, $SD = 0.80$) provided higher ratings than males ($M = 4.83$, $SD = 0.87$). The significant interaction revealed that females rated concrete words ($M = 3.41$, $SD = 0.99$) as significantly higher in emotionality than males did ($M = 1.55$, $SD = 0.46$).

Discussion

Our main research question addressed whether sex differences in the various ratings of abstract, concrete, and emotion words exist. Interestingly, although sex differences were not found for the emotion words, findings from the present study strongly suggest that such sex differences do exist for emotionality ratings for concrete words. Females rated concrete words as more emotional than males did. This significant finding suggests that males and females may process various word types differently, contingent upon the attribute on which the word is to be rated. Consequently, there may be subtle differences in the way males and females cognitively process emotionality of concrete stimuli. Although previous research has indicated a female advantage in the processing of verbal information and pictorial information in certain task domains (see e.g., Harshman & Paivio, 1987; Kimura & Clarke, 2002; Kimura & Seal, 2003), those studies did not examine emotionality characteristics as related to concrete stimuli. One might speculate that the female advantage in emotionality ratings for concrete words stems from the finding that emotion words are more imageable than abstract words (Altarriba & Bauer, 2004) combined with the claim that imageability creates a female advantage in processing concrete words in general (Graves, Landis, & Goodglass, 1981). Thus, given that concrete words are more imageable and that emotion characteristics also aid imageability, females may have a boost in processing concrete words in an emotional mode. Additional research is needed in this area to thoroughly understand the current findings and their implications with regard to sex differences in underlying cognitive processes. For example, odor stimuli may be used to elicit various responses that are emotion-related (see e.g., Chu & Downs, 2000; Cupchik & Philips, 2005; Herz, Eliassen, Beland, & Souza, 2004). Perhaps odorous stimuli act as a mediator in eliciting emotional memories or emotional responses that can affect the processing of other types of simultaneously presented stimuli. This is just one avenue for future research that may be investigated with regard to the processing of emotion.¹

Seidnitz and Diener (1998) reported sex differences in the recall of affective experiences. Specifically, they found that women recalled both more positive and more negative life events than men. Although they ruled out

1 We credit an anonymous reviewer for bringing this research suggestion to our attention.

retrieval mood, rehearsal, and affective intensity as possibilities for the sex differences, they discovered that differences in the detail in which events are *encoded* may contribute to the sex differences found in the recall of affective experiences. Seidlitz and Diener speculated that these results could be due to underlying factors such as early learning and social roles. The present study supports these speculations in that early learning and social roles may influence how males and females identify and mentally represent concepts in terms of their emotional attributes.

The current work also has implications for future research on the word attributes presently under investigation and for the mental representation of abstract, concrete, and emotion words. In past studies of sex differences in the rating of words on concreteness, imageability, and emotionality, the grouping of word types may have masked the true sex differences.

The results also challenge classic and current theories of word representation that present a uniform model irrespective of participant characteristics (such as sex). Models of semantic memory (e.g., spreading activation theory, Collins & Loftus, 1975) typically describe the structure of semantic memory and the mechanisms by which words or concepts are stored and activated. However, most models were derived and tested with the assumption that the associations that exist in memory across concepts are similar for both males and females. The current data suggest that even though common words are generally used to test most models, and these words are typically concrete nouns, their representation in memory may be influenced by factors related to sex (e.g., socialization, differential exposure to emotion concepts, etc.). A closer examination of models of semantic memory is needed to assess the generalizability of existing frameworks of semantic memory organization.

As mentioned earlier, having knowledge of the properties that characterize abstract, concrete, and emotion words may facilitate the development of reading and language acquisition methods and can be useful in mental health settings. According to Goleman (1995), the ability to recognize and label emotions is essential in the improvement of emotional understanding. Emotional understanding can lead to decreases in anxiety and social withdrawal. Therefore, by exploring which feature or features (concreteness, context-availability, imageability, and/or emotionality) are most important in word representation, researchers can develop methods to assist children in the learning and retrieval of words.

In conclusion, sex may play a more important role in the processing of concrete words than previously considered. Overall, the present results indicate that sex differences do exist, both across word types and across scales. Possibly, males and females differ in the way they cognitively process information. These findings also raise questions about previous research on concreteness effects and challenge current theories of word representation. Future research should be conducted to provide additional insight into these intriguing findings of sex difference.

References

- ALTARRIBA, J., & BAUER, L. M. (2004). The distinctiveness of emotion concepts: A comparison between emotion, abstract, and concrete words. *American Journal of Psychology*, *117*, 389-410.

- ALTARRIBA, J., BAUER, L. M., & BENVENUTO, C. (1999). Concreteness, context-availability, and imageability ratings and word associations for abstract, concrete, and emotion words. *Behavior Research Methods, Instruments, & Computers*, *31*, 578-602.
- BENJAFIELD, J., & MUCKENHEIM, R. (1989). Dates of entry and measures of imagery, concreteness, goodness, and familiarity for 1046 words sampled from the Oxford English Dictionary. *Behavior Research Methods, Instruments, and Computers*, *21*, 31-52.
- BLEASDALE, F. A. (1987). Concreteness-dependent associative priming: Separate lexical organization for concrete and abstract words. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *13*, 582-594.
- BURNS, N. R., & NETTLEBECK, T. (2005). Inspection time and speed of processing: Sex differences on perceptual speed but not IT. *Personality and Individual Differences*, *39*, 439-446.
- BURTON, L. A., HENNINGER, D., & HAFETZ, J. (2005). Gender differences in relations of mental rotation, verbal fluency, and SAT scores to finger length ratios as hormonal indexes. *Developmental Neuropsychology*, *28*, 493-505.
- CAMPOS, A. (1990). Concreteness, imagery, emotionality, and interest values of words when meaning is controlled. *Perceptual and Motor Skills*, *71*, 603-610.
- CAMPOS, A., & ASTORGA, V. (1988). Abstractness and emotional values for French and Spanish words. *Perceptual and Motor Skills*, *66*, 649-650.
- CAMPOS, A., & GONZALEZ, M. A. (1992). Imagery, concreteness, emotionality, and meaningfulness values of words: Replication and extension. *Perceptual and Motor Skills*, *74*, 691-696.
- CAMPOS, A., & SUERIRO, E. (1991). Stability of emotionality scores. *Perceptual and Motor Skills*, *73*, 795-798.
- CAPLAN, P. J., CRAWFORD, M., HYDE, J. S., & RICHARDSON, J. T. E. (1997). Sex differences in human cognition. New York: Oxford University Press.
- CATTANEO, Z., POSTMA, A., & VECCHI, T. (2006). Gender differences in memory for object and word locations. *Quarterly Journal of Experimental Psychology*, *59*, 904-919.
- CHIARELLO, C., SENEHI, J., & NUDING, S. (1987). Semantic priming with abstract and concrete words: Differential asymmetry may be postlexical. *Brain and Language*, *31*, 43-60.
- CHU, S., & DOWNS, J.J. (2000). Long live Proust: the odor-cued autobiographical memory bump. *Cognition*, *75*, B41-B50.
- CLORE, G. L., ORTONY, A., & FOSS, M. A. (1987). The psychological foundations of the affective lexicon. *Journal of Personality and Social Psychology*, *53*, 751-766.
- COLLINS, A. M., & LOFTUS, E. F. (1975). A spreading activation theory of semantic processing. *Psychological Review*, *82*, 407-428.
- CUPCHIK, G., & PHILIPS, K. (2005). The scent of literature. *Cognition and Emotion*, *19*, 101-119.
- DE GROOT, A. M. B. (1992). Determinants of word translation. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *18*, 1001-1018.
- DE GROOT, A. M. B. (1993). Word-type effects in bilingual tasks: Support for a mixed representational system. In R. Schreuder & B. Weltens (Eds.), *The bilingual lexicon* (pp. 27-51). Amsterdam: John Benjamins.

- FRIENDLY, M., FRANKLIN, P. E., HOFFMAN, D. M., & RUBIN, D. C. (1982). The Toronto word pool: Norms for imagery, concreteness, orthographic variables, and grammatical usage for 1080 words. *Behavior Research Methods and Instrumentation*, *14*, 375-399.
- GILHOOLY, K. J., & LOGIE, R. H. (1980). Age-of-acquisition, imagery, concreteness, familiarity, and ambiguity measures for 1,944 words. *Behavior Research Methods & Instrumentation*, *12*, 395-427.
- GOLEMAN, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- GRAVES, R., LANDIS, T., & GOODGLASS, H. (1981). Laterality and sex differences for visual recognition of emotional and non-emotional words. *Neuropsychologia*, *19*, 95-102.
- HARSHMAN, R. A., HAMPSON, E., & BERENBAUM, S.A. (1983). Individual differences in cognitive abilities and brain organization, part 1: Sex and handedness differences in ability. *Canadian Journal of Psychology*, *37*, 144-192.
- HARSHMAN, R. A., & PAIVIO, A. (1987). "Paradoxical" sex differences in self-reported imagery. *Canadian Journal of Psychology*, *41*, 287-302.
- HERZ, R.S., ELIASSEN, J., BELAND, S., & SOUZA, T. (2004) Neuroimaging evidence for the emotional potency of odor-evoked memory. *Neuropsychologia*, *42*, 371-378
- HUNT, R. R., & ELLIS, H. C. (2004). *Fundamentals of cognitive psychology* (7th ed.). Madison, WI: Brown & Benchmark.
- KIMURA, D., & CLARKE, P. G. (2002). Women's advantage on verbal memory is not restricted to concrete words. *Psychological Reports*, *91*, 1137-1142.
- KIMURA, D., & SEAL, B. N. (2003). Sex differences in recall of real or nonsense words. *Psychological Reports*, *93*, 263-264.
- NELSON, D. L., & SCHREIBER, T. A. (1992). Word concreteness and word structure as independent determinants of recall. *Journal of Memory and Language*, *31*, 237-260.
- PAIVIO, A. (1971). *Imagery and verbal processes*. New York: Holt, Rinehart, and Winston.
- PAIVIO, A., YUILLE, J. C., & MADIGAN, S. A. (1968). Concreteness, imagery, and meaningfulness values for 925 nouns. *Journal of Experimental Psychology*, *76*, 1-25.
- RUBIN, D. C., & FRIENDLY, M. (1986). Predicting which words get recalled: Measures of free recall, availability, goodness, emotionality, and pronounceability for 925 nouns. *Memory & Cognition*, *14*, 79-94.
- SCHWANENFLUGEL, P. J., AKIN, C., & LUH, W. (1992). Context availability and the recall of abstract and concrete words. *Memory & Cognition*, *20*, 96-104.
- SEIDLITZ, L., & DIENER, E. (1998). Sex differences in the recall of affective experiences. *Journal of Personality and Social Psychology*, *74*, 262-271.
- SHAVER, P., SCHWARTZ, J., KIRSON, D., & O'CONNOR, C. (1987). Emotion knowledge: Further exploration of a prototype approach. *Journal of Personality and Social Psychology*, *52*, 1061-1086.
- TOGLIA, M. P., & BATTIG, W. F. (1978). *Handbook of semantic word norms*. Hillsdale, NY: Erlbaum.
- YUILLE, J. C. (1968). Concreteness without imagery in PA learning. *Psychonomic Science*, *11*, 55-56.
- WHISELL, C. M. (1989). The dictionary of affect in language. In R. Plutchik & H. Kellerman (Eds.), *Emotion: Theory, research, and experience*, Vol. 4 (pp. 113-131). New York: Academic Press.

Appendix

Abstract Words	Concrete Words	Emotion Words
learning	costume	angry
innate	cloud	fear
mastery	brush	excited
truth	mirror	furious
chance	machine	terror
virtue	airplane	happy
innocence	pencil	pride
attitude	dictionary	scared
humid	garden	glad
appetite	scissors	shame
compulsion	lemonade	anxious
decency	string	sympathy
health	pepper	surprise
origin	animal	amused
beauty	balloon	sorrow
wealth	apartment	hate
entry	dentist	depressed
heritage	crutch	troubled
glory	factory	delighted
patriotism	cards	grief
dare	liquor	love
fault	newspaper	upset
inquiry	jewel	outraged
ability	basket	thrilled
legend	plate	jealous
fiction	eagle	hopeful
wisdom	building	uncertain
opportunity	penny	thankful
discovery	magazine	zealous
prevention	puzzle	concerned
concept	tower	afraid
chaos	mouth	unhappy
conquest	movie	grateful
essence	cigar	obsessed
advice	elephant	joy
drama	watermelon	worried
evolve	burglar	miserable
culture	coffee	nervous
freedom	fence	despair
quiet	jungle	annoyed
belief	police	disappointed
benefit	flute	dread
intellect	castle	sad
feature	clown	disgusted
ego	nurse	affection
false	person	mad
nonsense	crown	rage
heaven	truck	cheerful