VISUAL AND LINGUISTIC PROCESSING

OF ADS BY BILINGUAL CONSUMERS

David Luna
School of Business and Economics
Chapman University
One University Drive
Orange, CA 92866
Tel. 714-628-7347
Fax. 714-532-6081
luna@chapman.edu

Laura A. Peracchio
School of Business Administration
University of Wisconsin-Milwaukee
P.O. Box 742
Milwaukee, WI 53201
Tel. 414-229-3830
Fax. 414-229-6957
lperacch@uwm.edu

December 12, 2007

In the United States, the proportion of the total population that speaks a second language fluently is considerable and continues to increase due to migration and acculturation patterns. For example, one of the largest bilingual segments in the U.S. is the Hispanic population. Over 72% of the 31 million Hispanics in the United States speak both English and Spanish at home (Levey 1999). If one considers that the purchasing power of the Hispanic market is estimated to be over $300 billion (Zbar 1998) and that there exist many other bilingual groups in the U.S., the need to study bilingual consumers becomes evident. Particularly, understanding how bilingual consumers process ads in their first versus their second language is of crucial importance to marketers.

In this paper, we will examine how pictures can enhance ad processing by bilingual consumers. Extant research in psycholinguistics will be utilized to identify areas in which non-verbal cues can improve the effectiveness of ads targeting bilingual individuals. First, we review the literature addressing the issue of the semantic representation of words across languages. Pictures are proposed to improve the cross-language equivalence of ads. Then, we examine the relationship between words in each language and the concepts they represent. Pictures are proposed to facilitate processing of messages in the individual's weaker language.

CONCEPTS ACROSS LANGUAGES

Concepts and Their Representations

In cognitive psychology and psycholinguistics research, a distinction is often made between words and the concepts they represent. Thus, there is a separation between *form* and *meaning*. Words can be thought of as either external entities used as labels for internal concepts or, alternatively, as internal mental constructs associated with the concepts (Francis 1999). Information about words is contained in the lexicon, as part of lexical entries. Information about

concepts, or the meanings of words, is contained in a semantic system, which consists of a network of possible semantic components or features, of which any word meaning is identified with a subset or a particular pattern of activation across the entire system.

This conceptualization of words and concepts is consistent with a dual code approach to memory (Paivio and Desrochers 1980). Dual-coding theory holds that cognitive activity is mediated by two independent but interconnected symbolic systems specialized for encoding, organizing, storing, and retrieving two kinds of stimulus information. One system, the image system, is specialized for processing perceptual information concerning nonverbal objects and events and for generating mental images of such events. The other system, the verbal system, is specialized for processing linguistic information and generating speech. Paivio's dual code theory addresses the issue of separate systems for verbal and "conceptual" information, but his definition of the imaginal system does not completely coincide with the more recent theories regarding the separation of lexical (verbal) versus semantic (conceptual) memory. According to these psychological models, concepts are amodal representations, and both words and pictures are surface representations of those concepts. While words do not necessarily require semantic processing, pictures do involve processing at the semantic level. However, operationally, both approaches would agree in that pictorial information offers superior results with respect to measures such as recall (Paivio and Lambert 1981; Snodgrass 1984) and that it facilitates tasks such as word translation (La Heij, Hooglander, Kerling and Van der Velden 1996; Sholl, Sankaranarayanan and Kroll 1995).

Dual-code theorists would argue that knowledge about the world (semantic knowledge) is organized according to the way in which that knowledge is acquired, and hence that different underlying representations or systems of meanings will be accessed by two surface forms:

words versus pictures. Because dual codes are more easily formed for pictures than for words, pictures seem to lead to superior recall than words (Paivio 1971; Unnava and Burnkrant 1991). Similarly, most current bilingual researchers would agree that, even if there are not two qualitatively different codes for the two different surface representations (words and pictures), pictures are able to access the conceptual system more effectively and/or directly than words.

Words and Concepts: I Say "Potato", You Say "Patata"

One of the issues most often researched in cognitive psychology studies of bilingualism is whether translation-equivalent words in two languages access the same conceptual representation (shared representation) or if there is a separate conceptual system for each language (independent representation). Despite numerous attempts to determine which view is correct, the results are inconclusive, though most evidence seems to point to the view that the two languages of a bilingual tap a common semantic-conceptual system (Francis 1999). Instead of the extreme views of shared versus independent systems, a model that allows for some sharing and some independence simultaneously seems to better account for previous findings.

One such model is the Conceptual Feature Model or CFM (De Groot 1992), in which words in each language known by a bilingual activate a series of conceptual features. These features, or concepts, are language-independent and are distributed, so one word is connected to a number of concepts that ultimately define the subjective meaning of the word for each individual. For example, the features activated by the word "friend" are not necessarily the same features activated by its Spanish-language translation equivalent, "amigo." "Friend" may be associated to the concepts [McDonalds] and [honesty], while "amigo" may be associated to the concepts [honesty] and [male]. The difference in the conceptual features linked to each translation-equivalent word could be due to the different contexts in which the words are learned

and normally used. Figure 1 shows the hypothetical links between two translation-equivalent words and the concepts with which they are connected.   As shown, the conceptual nodes connected to "friend" may not be the same as the ones connected to "amigo."

Insert Figure 1 about here

The example in Figure 1 can be interpreted as depicting two language-specific knowledge schemas: the English "friend" schema, and the Spanish "amigo" schema. Tests of the CFM have found that concrete words (e.g., "window") share more conceptual features across languages than abstract words (e.g., "love"). This difference is apparent in that abstract words often do not seem to have an exact translation. De Groot (1992) theorizes that the reason for this difference may be that the function and appearance of concrete entities (e.g., apple, chair) tend to be the same across different language communities. Thus, the language learner creates a representation for a new concrete word that varies relatively little across languages. Abstract words do not have external referents that can be inspected during the learning process, so there is no guarantee that the content of the developing representations across languages will be similar. The meanings of abstract words have to be acquired from an objective source (e.g., a dictionary), or, more importantly, by deducing them from the contexts in which they are used. Since contexts are likely to differ between languages, or cultures, the meanings of these words are also likely to be different. Differences between concrete and abstract words also appears in monolingual settings. For example, in an experiment with monolingual subjects, de Groot (1989), found that concrete words have more and stronger links with the concepts they represent than abstract words.

Empirical evidence is abundant for one particular type of abstract words, emotionally-charged words. Whether a word is emotionally-charged or emotionally-neutral has been found to impact the degree of overlap in conceptual features between translation-equivalent words (De Groot 1992). There are two indications of this phenomenon: First, some languages have more emotion words than others, so a word in one language may cover the meaning of two or more words in another language. Second, even if the number of emotion words are similar in any two languages, the reference of corresponding words in the two languages may differ (Russell 1992). We can conclude that emotionally-charged words have more conceptual overlap between translation-equivalents than emotionally-neutral words (Kolers 1963).

Another variable that has an impact on lexicosemantic organization is the cognate status of words. A word is a cognate when its translation equivalent sounds and looks like it. For example, "addiction" and "adicción" are cognates, while "book" and "libro" are non-cognates. According to the CFM, cognates share a great deal more conceptual features across translation-equivalents than do non-cognates. Cognate effects on lexicosemantic organization may be due to two factors: First, cognate translation-equivalent words are generally derived from the same root in a common parent language (e.g., Latin or Greek), so they have probably preserved the meaning of this root over time. Consequently, cognates may have similar meanings. Another reason for the cognate effect may be that second language (L2) learners, noticing the form similarity between a cognate word and its translation, assume that the two also have a meaning similarity, conveniently linking the new L2 word with the concept representation of the first language (L1) word (de Groot 1992). Following this reasoning, we could infer that in a case in which an advertiser is targeting speakers of different language families (e.g., Finnish and

French), most words will be non-cognates. Therefore, in such case there will be little conceptual overlap between words in each language.

Theoretical Support for the CFM. The duality specified by the CFM finds support in a number of theories, which help explain the underlying processes resulting in language-specific schemas. The repeated coupling of certain concepts with an L1 word -for example, the concept [play] and the Spanish word "amigo" (friend), during L1 learning and the life of the individual provides consistent and strong mappings from those concepts to the L1 word (Kroll and De Groot 1997; MacWhinney 1997). These consistent mappings result in strong links between the L1 word and the concepts. Different associations are likely to happen during L2 learning. Other concepts are likely to be consistently present when the individual learns L2 words -for example, the concept [McDonalds] and the English word "friend", so alternate L2-specific links will be created between these nodes. This reasoning is consistent with the theory of Spreading Activation (Anderson 1983; Collins and Loftus 1975), which predicts that links that are "practiced", or observed, many times become stronger. Therefore, if we assume that the "amigo" - [play] link was practiced more than the "friend" - [play] link, the former will be stronger than the latter.

Also, according to spreading activation principles, encoding context plays a large role in the memory for an item. Anderson (1983) asserts that

> the encoding context determines the sense of the word chosen [i.e., one of its meanings] and that a trace is formed involving that sense and, perhaps, the encoding context. When the subject is tested, context will again determine the sense chosen and activation will spread from the chosen sense. Probability of recognition will be greater when the same sense is chosen because activation will be spreading from a sense node directly attached to the trace. (p. 283)

The language of a message can be considered a contextual cue that helps a particular word activate a series of nodes that would not be activated in another language, thus priming the

language-specific schemas implied by the CFM. Note that this effect is similar to Encoding Specificity (Tulving and Thompson 1971).

Barsalou's (1982) work also helps explain the notion of language-specific schemas. Properties, or concepts associated with a stimulus, become automatically activated by that stimulus after being frequently associated with it during processing. Frequent pairings of a stimulus and a concept cause an automatized relation between them to be established in memory. Barsalou indicates that there are two types of concepts likely to be frequently active during the processing of a stimulus: concepts having high diagnosticity ("gills" for "fish"), and concepts relevant to how people typically interact with instances of the respective stimulus ("edible" for "apples"). Hence, individuals' experience may be a source of differences in cognitive structure. Since culture shapes human experience, cultural differences may give origin to different patterns of activation or cognitive structures in individuals.

The Conceptual Feature Model and Dual Code Theory. The CFM specifies that concrete words have a higher degree of conceptual overlap than abstract words, the latter including emotionally-charged words. This is consistent with dual code theory, which argues that concrete words have a more direct relationship with their imaginal referents than abstract words. Hence, concrete words are more easily imagined as external objects which do not vary across languages. As a result, the conceptual features associated with concrete words will be more consistent across languages than the conceptual features of abstract words, as predicted by the CFM.

The Conceptual Feature Model and Pictures in Advertising. The CFM implies that, regardless of how well advertisers translate a word or text from one language to another, the meaning will not be exactly the same. The conceptual features activated by a word like "amigo" will likely not be the same as those activated by its translation-equivalent "friend." Recent studies in consumer

research support this statement (e.g., Luna and Peracchio 1999a). It seems, then, that if a higher

degree of equivalency is sought between ads in different languages (Douglas and Craig 1984),

advertisers must ensure that the main claim of the ads is expressed by visual cues in addition to

verbal cues. As discussed above, pictures are objective external referents less likely to vary in

meaning across languages and more directly linked to conceptual representations. Therefore,

pictures may improve the cross-language equivalency of messages. However, as predicted by

the CFM, this effect will be more (less) noticeable when the ad's claims are abstract (concrete),

emotionally-charged (emotionally-neutral), or the two languages belong to different families (the

same family).

> **Proposition 1**. Ads containing abstract or emotionally-charged messages in which visual
>
> cues express the same message as the verbal cues will achieve a higher level of cross-
>
> language conceptual equivalence than similar ads in which visual cues do not support the
>
> verbal cues.
>
> **Proposition 2**. When targeting speakers of languages of different language families, ads
>
> in which visual cues express the same message as the verbal cues will achieve a higher
>
> level of cross-language conceptual equivalence than similar ads in which visual cues do
>
> not support the verbal cues.

This section examined the issue of semantic representation in the bilingual's mind. A

psycholinguistic model was reviewed that explains how some conceptual features may be shared

across translation-equivalent words while others may be language-specific. The next section

will address another topic of importance in bilingual psycholinguistic research: the nature of the

links between words and their meanings. In particular, we will examine the effect of pictures on

the links between lexical representations (words) and the concepts they represent (words'

meanings).

CONCEPT-WORD LINKS ACROSS LANGUAGES

A recent and widely accepted model of bilingual concept representation is the Revised

Hierarchical Model, or RHM (Dufour and Kroll 1995; Kroll and De Groot 1997). This model

builds on previous findings which suggest that there exist two levels of representation: the

lexical (word) level and the conceptual (meaning) level. At the lexical level, each language is

stored separately. However, at the conceptual level there is a unitary system in which words in

each language access a common semantic representation or meaning (see Figure 2).

```
----------------------------------
         Insert Figure 2 about here
----------------------------------
```

The connections between words in different languages made at the lexical level are

referred to as *word associations* or lexical links, while the connections in memory between

lexical representations in either language and the meanings they represent are referred to as

conceptual links. The model specifies a stronger lexical link from an individual's second

language (L2) to his first language (L1) than from an individual's first language to his second

language. Similarly, there is an asymmetry between L1 and L2 conceptual links. Conceptual

links from L2 words to the concepts they represent are weaker than conceptual links between L1

words and their respective concepts. Empirical testing of the RHM supports the proposition that

semantic processing of L2 verbal stimuli is likely to be more difficult than processing equivalent

L1 stimuli. This effect has been explained by suggesting that L1 stimuli have more direct

access to concepts than L2 stimuli due to the asymmetry in the strength of L1 and L2 lexical and

conceptual links, as depicted in Figure 1. At the same time, research in psycholinguistics testing

the RHM has found that the accessibility to concepts of an L2 text may be facilitated by manipulating other elements of the stimulus, such as whether it is accompanied by a congruent picture.

For example, La Heij, Hooglander, Kerling, and Van Der Velden (1996) exposed bilingual subjects to words that had to be translated into a different language. La Heij et al. (1996) found that translation of the written stimuli from L2 to L1 was facilitated in the form of shorter latencies by congruent pictures, while incongruent pictures resulted in higher latencies. Thus, pictures seem to aid or hamper language processing, depending on their level of relatedness to the textual stimulus. Consistent with the RHM, La Heij et al. (1996) concluded that respondents are able to access concepts from L2, but do so with more difficulty than from L1. More importantly, La Heij et al.'s (1996) findings imply that pictures may moderate the predictions of the Revised Hierarchical Model. That is, the weaker L2 conceptual links may be "strengthened" by a pictorial cue, which facilitates activation of the concept represented by the L2 word.

Picture Effects In Advertising

A number of advertising researchers have examined the role of pictures in ad processing by monolingual individuals (Alesandrini 1982; Holbrook and Moore 1981; Houston, Childers and Heckler 1987; Lutz and Lutz 1977; Schmitt, Tavassoli and Millard 1993). Several studies have theorized that pictures that are congruent with the brand name of the product featured in an ad (interactive pictures) facilitate processing of the message by providing a frame to process the ad claims (Houston, Childers and Heckler 1987). In addition to congruence between the brand name and the ad picture, the relationship or congruence between the product attribute described in the ad claims and the ad picture must also be considered. If they are congruent (consistent),

previous research suggests that processing of the claims is facilitated (Houston, Childers and Heckler 1987). If the ad claims are incongruent (inconsistent), processing is more difficult because the consumer needs to resolve the incongruity between the new information presented by the ad claims and the prior knowledge established by the picture.

Other studies (Schmitt, Tavassoli and Millard 1993) have used the Spreading Activation paradigm (Anderson 1983) to explain picture effects on ad processing. This research also predicts that the probability of retrieving a concept is higher when copy and text are congruent than when they are not. Because pictures are more easily accessed in memory than verbal information (Paivio 1986), the probability of a concept being retrieved is higher if it is closely associated with a picture (Schmitt, Tavassoli and Millard 1993; Unnava and Burnkrant 1991).

From this research, we can conclude that when the product attribute expressed in the ad claims and/or the product's brand name express the same (or a similar) concepts as the ad picture, strong linkages will be formed in memory that will facilitate processing of these textual ad elements. Hence, memory will be enhanced when congruent text elements and pictures are employed. Given these findings in consumer research and La Heij et al. (1996)'s findings with bilinguals, it would seem that congruity between the ad picture and textual ad elements may make retrieval of the L2 information less cognitively effortful and enhance recall.

> **Proposition 3**. Second language ads in which the picture is congruent with the ad's claim will lead to higher recall than second language ads without pictures or in which the picture is not congruent with the ad's claim.

Picture Effects in Cross-Language Web-Sites

As with advertising, pictures that are congruent with the content of a web site are expected to facilitate processing of second language web sites. This is particularly relevant if we

take into account the global reach of the internet as a communications medium. On the internet, an important measure of effectiveness is whether a site's visitor can achieve an optimal navigation experience, or *flow*.

Computer-mediated environments like the World Wide Web have a unique characteristic: interactivity. In such an environment, individuals may reach a state in which their attention is focused solely on the universe contained within the boundaries of their network navigation experience. This state is frequently evidenced by users' comments like "I forgot where I was," or "I completely lost track of time." This state has been labeled *flow* (e.g., Csikszentmihalyi & LeFevre, 1989). Recently, Hoffman and Novak (1996) defined flow in the context of Web navigation as "the state occurring during network navigation, which is (1) characterized by a seamless sequence of responses facilitated by machine interactivity, (2) intrinsically enjoyable, (3) accompanied by a loss of self-consciousness, and (4) self-reinforcing" (p. 57). Hoffman & Novak's (1996) conceptualization of flow refers to a general state resulting from a positive internet navigation experience. In the present paper we adapt their concept to apply to individual web sites.

An e-commerce site's capacity to induce a state of flow in their visitors is an important attribute. Key consequences of flow for consumers are increased learning, exploratory and participatory behaviors, positive subjective experiences, and a perceived sense of control over their interactions in the computer-mediated environment. Antecedents of flow include: (1) a balance between the demands, or challenges, of network navigation and the ability of visitors to navigate the site; (2) interactivity and vividness of the site, and (3) the involvement of the visitor, either intrinsic or extrinsic (Hoffman & Novak, 1996).

Language is expected to have an effect on whether a visitor to a web site reaches a state of flow. According to the Revised Hierarchical Model, it is more difficult to process L2 stimuli than L1 stimuli. Therefore, L2 sites may increase the demands or challenges for visitors and consequently reduce their likelihood of achieving flow. However, a site's language and certain site design elements may interact to influence whether the site's visitor achieves a flow experience. Hence, if a site is in the visitor's second language, it may generally be more difficult to experience flow in L2 than in L1, but even second language sites may be conducive to flow if they are designed so non-verbal cues help visitors process the verbal content. Theoretical support for this proposed interaction can be found in previous research examining the moderating effect of pictures on the asymmetry between L1 and L2 conceptual link strength described in the Revised Hierarchical Model (La Heij et al. 1996; Luna and Peracchio 1999b).

> **Proposition 4**: Web sites in the visitor's second language will be less likely to lead to the flow experience than web sites in their first language if the sites do not contain non-verbal cues congruent with the site content.

> **Proposition 5**: Web sites in the visitor's second language will be as likely to lead to the flow experience as web sites in their first language if the sites contain non-verbal cues congruent with the site content.

We can conclude that provided a web site's content is supported by adequate non-verbal cues, it may not be necessary to translate a web site to each of its international visitors' respective languages.

CONCLUSION

In this paper we examined the effect of pictures on ad processing by bilingual consumers. We utilized a model from psycholinguistic research, the Conceptual Feature Model (CFM) to

suggest that pictures can help advertisers achieve cross-language message equivalence. The CFM implies that the meaning of translation-equivalent words may not overlap completely across languages. Pictures can help bridge this lack of overlap by supplying an external objective referent.

Additionally, we argue that pictures can help reduce the increased processing load involved in second language versus first language processing. The Revised Hierarchical Model describes how conceptual processing is less likely to occur in individuals' second language than in their first language. Previous research has found that pictures can make the links between second language words and their meanings stronger. These conclusions are extended to advertising and web site navigation.

This paper underscores the facilitating role of visual cues in advertising targeting bilingual individuals. Considering that a large population of the world speaks more than one language, it is surprising that bilingual populations have received very little attention from advertising researchers. Further research must be conducted in order to understand whether existing models of information processing and consumer behavior need to be adapted to this important segment of the global population.

REFERENCES

Alesandrini, Kathryn Lutz (1983), "Strategies that Influence Memory for Advertising Communications," in *Information Processing Research in Advertising*, ed. Richard Jackson Harris, Hillsdale, NJ: Lawrence Erlbaum, 65-82.

Anderson, John (1983), "A Spreading Activation Theory of Memory," *Journal of Verbal Learning and Verbal Behavior*, 22, 261-295.

Barsalou, Lawrence (1982), "Context-Independent and Context-Dependent Information in Concepts," *Memory and Cognition* 10(1), 82-93.

Collins, Allan and Elizabeth Loftus (1975), "A Spreading-Activation Theory of Semantic Processing," *Psychological Review*, 82(6), 407-428.

Csikszentmihalyi, Mihaly & Judith LeFevre (1989), "Optimal Experience in Work and Leisure," *Journal of Personality and Social Psychology*, 56 (5), 815-822.

Douglas, Susan P. and C. S. Craig (1984), "Establishing equivalence in comparative consumer research," in Erdener Kaynak and Ronald Savitt, eds., *Comparative Marketing Systems*, Praeger: New York, 93-113.

Dufour, Robert and Judith Kroll (1995), "Matching Words to Concepts in Two Languages: A Test of the Concept Mediation Model of Bilingual Representation" *Memory and Cognition*, 23 (March), 166-180.

Francis, Wendy (1999), "Cognitive Integration of Language and Memory in Bilinguals: Semantic Representation," *Psychological Bulletin*, 125 (2), 193-322.

Groot, Annette de (1989), "Representational Aspects of Word Imageability and Word Frequency as Assessed Through Word Association," *Journal of Experimental Psychology: Learning, Memory and Cognition*, 15(5), 824-845.

-------------- (1992), "Bilingual Lexical Representation: A Closer Look at Conceptual

　　　　Representations," in *Orthography, Phonology, Morphology, and Meaning*, ed. R. Frost

　　　　and L. Katz, Amsterdam: Elsevier, 389-412.

Hoffman, Donna & Thomas Novak (1996), "Marketing in Hypermedia Computer-Mediated

　　　　Environments: Conceptual Foundations," *Journal of Marketing*, 60 (July), 50-68.

Holbrook, Morris B. and William L. Moore (1981), "Feature Interactions in Consumer

　　　　Judgments of Verbal Versus Pictorial Presentations," *Journal of Consumer Research*, 8

　　　　(June), 103-113.

Houston, Michael J., Terry L. Childers, and Susan E. Heckler (1987), "Picture-Word

　　　　Consistency and the Elaborative Processing of Advertisements," *Journal of Marketing

　　　　Research*, 24 (November), 359-369.

Kolers, P.A. (1963), "Interlingual Word Associations," *Journal of Verbal Learning and Verbal

　　　　Behavior*, 2, 291-300.

Kroll, Judith F. and Annette de Groot (1997), "Lexical and Conceptual Memory in the Bilingual:

　　　　Mapping Form to Meaning in Two Languages," in *Tutorials in Bilingualism:

　　　　Psycholinguistic Perspectives*, eds. Annette de Groot and Judith F. Kroll, Mahwah, NJ:

　　　　Lawrence Erlbaum, 169-199.

La Heij, Wido, Andre Hooglander, Robert Kerling, and Esther Van Der Velden (1996),

　　　　"Nonverbal Context Effects in Forward and Backward Word Translation: Evidence for

　　　　Concept Mediation," *Journal of Memory and Language*, 35 (October), 648-665.

Levey, Richard H. (1999), "Give Them Some Credit," *American Demographics*, May, 41-43.

Luna, David and Laura A Peracchio (1999a), "What's in a Bilingual Mind? Examining
Bilingual Conceptual Representation." Paper presented at the Association for Consumer
Research annual conference, Columbus, OH.

------------ and ------------ (1999b), "Picture Effects in Advertising to Bilinguals," in *Proceedings
of the Society for Consumer Psychology Winter Conference*, Society for Consumer
Psychology, 19-24.

Lutz, Kathy A. and Richard J.Lutz (1977), "Effects of Interactive Imagery on Learning:
Application to Advertising," *Journal of Applied Psychology*, 62 (August), 493-498.

MacWhinney, Brian (1997), "Second Language Acquisition and the Competition Model," in
Tutorials in Bilingualism: Psycholinguistic Perspectives, ed. Annette de Groot and
Judith Kroll, Mahwah, NJ: Lawrence Erlbaum & Associates, 113-144.

Paivio, Alan (1971), *Imagery and Verbal Processes*. New York: Holt, Rinehart and Winston.

------------ (1986), *Mental Representations: A Dual Coding Approach*. New York: Oxford
University Press.

------------ and Alain Desrochers (1980), "A Dual-Coding Approach to Bilingual Memory,"
Canadian Journal of Psychology, 34 (4), 388-399.

------------ and Wallace Lambert (1981), "Dual Coding and Bilingual Memory," *Journal of
Verbal Learning and Verbal Behavior*, 20, 532-539.

Russell, James A. (1991), "Culture and the Categorization of Emotions," *Psychological Bulletin*,
110 (3), 426-450.

Schmitt, Bernd, Nader T. Tavassoli, and Robert T. Millard (1993), "Memory for Print Ads:
Understanding Relations among Brand Name, Copy, and Picture," *Journal of Consumer
Psychology*, 2 (1), 55-81.

Snodgrass, Joan Gay (1984), "Concepts and their Surface Representations," *Journal of Verbal Learning and Verbal Behavior*, 23 (February), 3-22.

Tulving, Endel and D. M. Thompson (1971), "Retrieval Processes in Recognition Memory: Effects of Associative Context," *Journal of Experimental Psychology*, 87, 116-124.

Unnava, H. Rao and Robert E. Burnkrant (1991), "An Imagery-Processing View of the Role of Pictures in Print Advertisements," *Journal of Marketing Research*, 28 (May), 226-231.

Zbar, Jeffery D. (1998), "Agency Execs Say Marketers Want in," *Advertising Age*, August 24, s16.

FIGURE 1

THE CONCEPTUAL FEATURE MODEL*
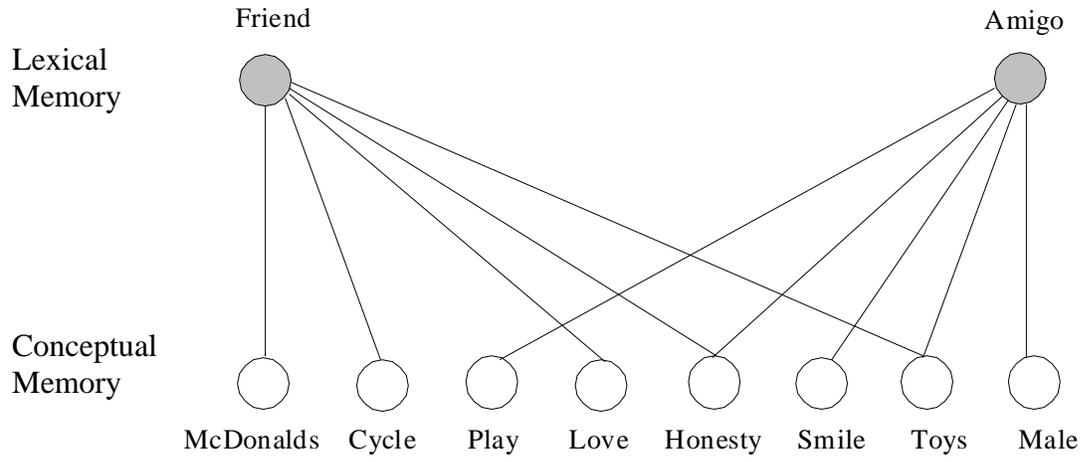
*Adapted from De Groot (1992).

FIGURE 2
THE REVISED HIERARCHICAL MODEL FROM DUFOUR AND KROLL (1995)

Lexical Links

L1 – – – → L2

Conceptual
Link

Conceptual
Link

Concepts