Uncovering the Cognitive Duality of Bilinguals through Word Association

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ABSTRACT

This article examines the nature of the cognitive structures of bilingual consumers. The article begins by describing a psycholinguistic model that suggests that bilinguals have different structures for each of the languages they know. In a marketing context, this model implies that even the perfect translation of a marketing communication may not have the same meaning as the original. The article proposes that word-association tasks may help marketers gain insight into the dual cognitive structures of bilingual consumers and discover possible differences in meaning across languages. © 2002 Wiley Periodicals, Inc.

Most models of memory studied by psychologists and consumer researchers have been tested and validated with monolingual individuals. However, much of the world's population speaks more than one language. For example, 59% of U.S. Hispanics, the fastest-growing minority population in that country, are considered bilingual speakers of English and Spanish (U.S. Bureau of the Census, 1998). It is of great importance, therefore, to examine how memory models can be extended to multilingual populations.

Memory models that have been developed and validated with the use

of samples from monolingual (i.e., North American) populations disregard two important factors: (a) whether individuals can speak more than one language, and (b) if they speak more than one language, whether they are being asked to operate in their first or second language. As recent research in psychology and consumer behavior indicates, bilingualism can have a profound impact on information processing. For example, bilingual consumers' affect toward the advertiser and the ad can be influenced by the language in which the ad is written (Koslow, Shamdasani, & Touchstone, 1994). Also, the interaction of the language of an ad with nonverbal cues such as pictures must be taken into consideration when a bilingual market is targeted. For instance, the effect of pictures on ad memory and affective responses varies depending on whether the ad is presented in the consumers' first or second language (Luna & Peracchio, 2001).

From brand-management and advertising perspectives, a central issue not yet explored is the nature of the meaning that bilingual individuals assign to a verbal communication and whether this meaning changes depending on the language in which the communication is presented. In other words, are meaning structures language-specific? This article will address this issue by examining the cognitive structure of bilinguals and describing a theory-based word-association methodology that researchers can utilize to find whether language impacts consumers' interpretations of marketing messages. This research will offer insight into bilingual language and memory structures, discuss some of the central psycholinguistic issues in bilingual research, and outline implications for consumer researchers.

A model of bilingual lexicosemantic organization, the Conceptual Feature Model (de Groot, 1992), has been tested through the use of word association tasks. Word elicitation or association is a projective technique successfully used in consumer research to probe consumers' implicit memory (Krishnan & Chakravarti, 1999; Olson & Zaltman, 2000). The Conceptual Feature Model suggests that bilinguals may possess language-specific cognitive structures. In other words, two translation-equivalent words can be connected to different cognitive schemas and thus may have different meanings. Bilinguals' schemas may therefore be language-dependent and characterized by a cognitive duality.

Relevant psychology and consumer research studies that describe the possible uses of word association to explicate the cognitive structure of bilingual individuals are reviewed. A description of how this technique has been used in psycholinguistics research is then given. Word association can be particularly useful in studying bilingual memory because it helps to identify the degree to which the same word or message can carry different meanings depending on the language in which it is presented.

Finally, a word-association methodology that can be used to explore the implications of presenting bilinguals with the same key word or

message translated into different languages is outlined. Hence, the research question addressed by this methodology is whether even the perfect translation of a message can express the same meaning as the original message. This methodology also uncovers the parallel, or dual, cognitive structures linked to translation-equivalent words that may exist in the minds of bilingual consumers.

THE CONCEPTUAL FEATURE MODEL

The question of whether bilinguals have different cognitive structures for each of their languages has been the subject of intense debate for many years (Ervin, 1961; Francis, 1999; Kolers, 1963). From a psycholinguistic perspective, the question is whether, in bilinguals' minds, each language they know possesses its own memory store. Some studies have reported evidence for the independence between a bilingual's two language representations (e.g., Kolers, 1963). Other theorists suggest that all languages known by an individual share a single representational system (e.g., Schwanenflugel & Rey, 1986). A recent and widely accepted model that synthesizes both views is the Revised Hierarchical Model (Altarriba, Kroll, Sholl, & Rayner, 1996; Dufour & Kroll, 1995; Kroll, 1993; Kroll & de Groot, 1997). This model builds on previous findings (Durgunoglu & Roediger, 1987; Snodgrass, 1984), which suggest that there exist two levels of representation: the lexical (word) level and the conceptual (meaning) level. At the lexical level, each language seems to be 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. Thus, according to Dufour and Kroll (1995), bilingual individuals possess a "hierarchical arrangement of words and concepts, with a separation at the lexical level but with connections to a semantic system that is shared across languages." The conclusion that the semantic system is at least partly shared across languages was confirmed by Francis's (1999) extensive review of the literature on bilingual semantic representation, the results of which rejected the notion of separate meaning systems for each language.

A model that complements the Revised Hierarchical Model is used to develop a methodology to investigate the potential differences in meaning between a word in one language and its translation equivalent in another language. This model, the Conceptual Feature Model (CFM) (de Groot, 1992), examines more closely the nature of the links between words and their meanings hypothesized by the revised hierarchical model. The CFM is a model of bilingual lexicosemantic (i.e., language) organization that specifies that 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 with the concepts "McDonalds" and "honesty", while *amigo* may be associated with 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*.

The example in Figure 1 can be interpreted as depicting two language-specific knowledge schemas: the English *friend* schema and the Spanish *amigo* schema. Hence, the CFM implies a certain cognitive duality of the bilingual mind, or the existence of coexisting language-specific cognitive structures. 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.

By contrast, 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. Because contexts are
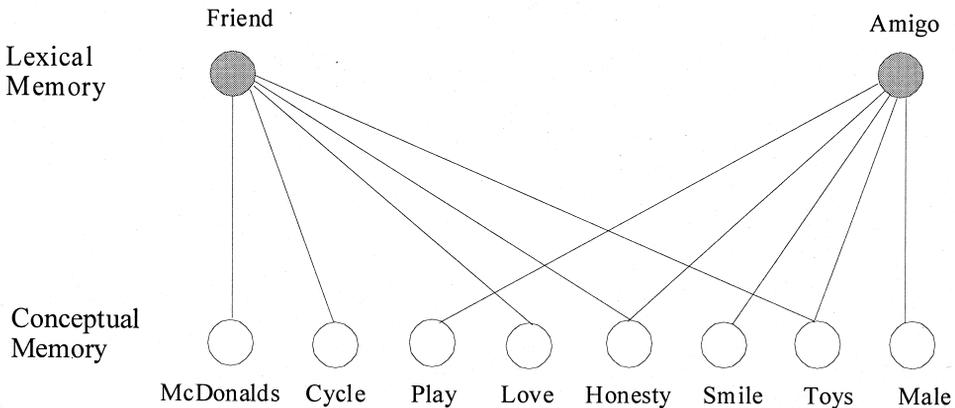

Figure 1. The conceptual feature model (adapted from de Groot, 1992).

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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 appear in monolingual settings. Hence, in a study with monolingual subjects, de Groot (1989) found that concrete words have more and stronger links with their corresponding concepts than abstract words.

Another variable that has an impact on bilingual 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 its Spanish-language translation equivalent *adicción* are cognates, whereas *book* and its Spanish-language translation equivalent *libro* are noncognates. According to the CFM, cognates share a great deal more conceptual features across translation equivalents than do noncognates. 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 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 second language word with the concept representation of the first language word (de Groot, 1992).

The Conceptual Feature Model and Memory Models

Possibly the most widespread model of memory in consumer research is the associative-network or spreading-activation model (Anderson, 1983; Collins & Loftus, 1975). According to spreading-activation models of memory, knowledge is stored in associative networks, structures formed by conceptual nodes or concepts and the links between them. When an initial concept is activated, activation spreads in a random fashion to the concepts connected to it. Therefore, the activation of concepts depends on the number and strength of the links that the initial concept possesses. The more links the initial concept has, the lesser the likelihood that connected concepts have of being activated. The stronger the link between the initial concept and a concept connected to it, the greater the likelihood that the latter will be activated.

The CFM also operates within that paradigm but it does not necessarily assume an associative-network model of memory. Although the model makes reference to conceptual nodes or features to which lexical representations are linked, it does not make any explicit assumptions as to the nature of these features. For example, the CFM could still be applied to bilingual lexicosemantic organization taking a frame theory perspective (Barsalou, 1992; Mitchell, 1982). Frame theory specifies that knowledge is organized in memory to a greater degree than the

associative-network model implies. Hence, two levels of meaning are identified: attributes and their values. Attributes are characteristics of concepts that are possessed by at least some members of a category (for example, *color*). These attributes can take a variety of values, which differentiate between one object and another (for example, *red*). Within this theory, relations between attributes are called structural invariants. Relationships among the values that the attributes can take are called constraints (Lawson, 1998).

The key implication of frame theory for bilingual lexicosemantic organization is the notion that the attribute level mediates the link between an object and its meaning, helping individuals compare objects to each other on common characteristics and maintain organized memory structures. From a frame-theory perspective, then, it could be hypothesized that words in two different languages, like *amigo* and *friend,* could potentially activate some common and some language-specific attributes. Hence, a Spanish–English bilingual presented with the word *amigo* may not even think of the attribute "place of employment" but when the same individual hears the word *friend,* he or she might think of such an attribute. On the other hand, both *amigo* and *friend* might be linked to the attribute "where to have lunch." But even if translation-equivalent words are connected to the same attributes, they may be linked to different values of those attributes. For instance, *friend* may be connected, through the attribute "where to have lunch", to the value "pizzeria" but *amigo* may be associated with the value "taquería."

Frame theory, particularly the notion of structural invariants and constraints, raises an important issue for the CFM: Are the conceptual features described in the model related to each other? The CFM would not in principle oppose these conceptual relationships. It could even be hypothesized that relationships between attributes and/or values are language specific. For example, the relationship or constraint between the values *coffee* and *cigarette* may be present for the word *amigo* but not for the word *friend*.

Therefore, the CFM is not inconsistent with alternative views of knowledge structures like frame theory. Conceptual features, attributes, and/or values are all language-independent semantic elements. The language of the lexical stimulus seems to act as a cue that activates one or another set of those conceptual elements. Perspectives such as frame theory can be adopted when one is considering bilingual lexico-semantic organization. Indeed, recent research on bilingual cognition addresses the issue of conscious control that is so important in frame theory (Lawson, 1998). That research explores the means by which bilingual individuals can control their two language systems during language production and proposes an inhibitory control model. In such model, language-task schemas (modulated by a higher-level attentional system) reactively inhibit potential competitors for production at the

lexical level by selecting words in one language or the other (Green, 1998).

The present article, however, focuses on consumers' automatic conceptual associations to words in different languages. The traditional associative-network model of memory is appropriate for this purpose, so for the sake of simplicity this model will be followed in the rest of the article. The present research therefore addresses two of the main drawbacks of methodologies taking the associative-network perspective: their assumption of automatic-retrieval processes and their lack of reliability estimates (Lawson, 1998). The methodology advocated in this article addresses both drawbacks by specifically focusing on the automatic nature of associations to key verbal stimuli and by providing a procedure to test reliability.

The CFM has been tested with the use of a variety of tasks, including translation of word pairs (de Groot, 1992) and word associations (Van Hell & de Groot, 1998). The results of these studies validate the CFM and serve as a basis for the suggestion that bilinguals indeed possess language-specific cognitive structures. Relevant research that has utilized a word-association methodology will be reviewed. This review will provide a theoretical basis for a set of methodological guidelines for the application of word association to uncovering the cognitive structure of the bilingual mind. Next, the method will be defined, its theoretical rationale described, and its use in psychology and consumer research discussed.

WORD ASSOCIATION AND COGNITIVE STRUCTURES

The spreading-activation model of memory can help to provide a theoretical structure for interpreting the objectives and results of word-association tests, an indirect projective technique. Word-association tests involve asking a respondents to list the thought or thoughts they have when they think about a particular word, concept, or idea. Thus, word-association tests offer insight into memory networks. They can tap into individual memory networks and provide researchers with information regarding which concepts are more strongly linked to an initial stimulus word. In addition, word associations can provide information about the number and nature of the concepts connected to the stimulus word.

Two main classifications of word-association tasks exist. First, word-association tests can be classified according to the number of associates that subjects are asked to elicit in response to a specific stimulus word. Discrete word associations consist of presenting subjects with a stimulus word and asking them to produce (write down or pronounce) only the first word that comes to their minds in response to it. This type of word association, therefore, elicits the one concept that is most strongly

linked to the stimulus word. Continued word associations also involve providing subjects with a stimulus word. However, subjects are asked to produce as many words as they can in response to the initial stimulus within a prespecified period of time. Subjects are carefully instructed to produce concepts directly linked to the stimulus word, and not chain responses to each other (i.e., write down responses linked to previously elicited associates, not to the original stimulus word). Continued word associations can provide information about the number and nature of the concepts associated with the initial stimulus. In addition, an examination of the associates first mentioned by subjects can be used to identify the concepts more strongly linked to the stimulus.

A second classification of word-association tasks is based on the type of concepts that subjects are asked to elicit. Free-association tasks consist of asking subjects to provide in their protocols any word that comes to their minds. Restricted-association tasks are those in which subjects must limit their answers to specific types of words. For example, restricted associations might specify that subjects may only write down sports teams, food products, or proper nouns. Hence, free-association tasks can potentially tap into the whole memory structure of individuals, whereas continued-association tasks can be used to explore specific domains within subjects' knowledge structures.

Word-association tasks have been used extensively in psychology to map cognitive structures. As a result, psychologists have developed and applied a variety of methodologies to analyze word association data. For example, Garskof and Houston (1963) describe how to compute an index (the relatedness coefficient) to measure the degree of association or meaning overlap between several concepts based on a continued word-association task. In particular, their methodology incorporates the response frequency to a given stimulus word with the overlap between response distributions for pairs of stimulus words and thus provides a procedure for describing cognitive structures from word associations. Shavelson (1972) utilizes this relatedness coefficient to map individuals' cognitive structures with respect to the specific domain of physics. Other research has found that word-association methodologies produce stable results (Preece, 1976; Shavelson & Stanton, 1975).

In spite of their common use in recent psychology studies (e.g., Stacy, Leigh, & Weingardt, 1997) and the encouragement of consumer researchers (Mitchell, 1982; Olson & Zaltman, 2000), word-association tasks have not been utilized extensively in consumer research. Several recent studies (Mitchell & Dacin, 1996), however, have adapted the procedure to assess constructs like consumer expertise. The lack of use of word association is somewhat surprising, given that the results of these tasks have obtained reasonable levels of test−retest reliabilities (Olson & Muderrisoglu, 1979; Preece, 1976) and strong evidence of convergent validity between various methods of measuring cognitive structures and word associations (Preece, 1976; Shavelson & Stanton, 1975).

Perhaps one of the reasons the word-association methodology has not been used to its fullest extent in consumer research is that guidelines and applications are scarce. Successful use of the word-association paradigm in psycholinguistic research will now be described, with particular emphasis on the usefulness of word-association tasks in studying bilinguals' cognitive structures.

Word Association in Psycholinguistics

Psycholinguistics researchers often use the word-association paradigm to gain insight into how individuals organize and process the information coded in language. Word associations can shed light on research questions such as whether certain types of words are linked to richer cognitive structures. For example, de Groot (1989) used both discrete and continued word-association tasks to evaluate whether word imageability and word frequency had an impact on the associates elicited by subjects. Although word imageability of a stimulus word is related to the construct of link strength in associative networks as discussed earlier, word frequency is related to the number of links departing from the stimulus word. Among other conclusions, the results of de Groot's series of experiments suggest that the number of links may not be as important as their strength, because word imageability had consistent effects on word associations (e.g., faster, larger sets of associates) whereas word frequency did not. De Groot's research, therefore, can be taken as an example of how word-association tasks can be utilized for theory testing in psychology and psycholinguistics.

To this point, only the implications of word-association tasks in a monolingual setting have been discussed, utilizing individuals who speak only one language, in single-language experiments. However, word associations can be even more useful in understanding how bilingual individuals process information and language.

WORD ASSOCIATION AND BILINGUALS' COGNITIVE STRUCTURES

Word-association tasks have been used in bilingual research on a number of occasions (Kolers, 1963; Luna & Peracchio, 1999; Taylor, 1976; Van Hell & de Groot, 1998). Word associations are considered appropriate to examine an individual's conceptual structure because, as previous studies suggest, the vast majority of associative responses are related in meaning to the presented stimulus words. At the same time, few reflect some lexical variation on the stimulus words, like rhyme or morphological inflections (de Groot, 1989; Postman & Keppel, 1970). Thus, through word associations, researchers can gain access to conceptual relationships relatively free of interference from lexical-level as-

sociations. Because word-association tasks have proved to be useful in tapping into individuals' conceptual schemas, the methodology suggested in this article to uncover bilinguals' cognitive duality will utilize a word-association paradigm.

The present guidelines adapt and improve on methods from Taylor (1976) and Van Hell and de Groot (1998). Taylor's (1976) study examined the degree to which two translation-equivalent words elicit similar associates in different languages. The research consisted of administering a continued word-association task in which subjects had to produce a list of associates when presented with a key word. The key dependent measure was the overlap between lists of associates produced by bilingual individuals in response to translation-equivalent words in French and English during the course of two different sessions. Taylor's findings showed that there was little overlap between lists. Taylor also found that concrete and cognate words have larger overlaps than abstract and noncognate words, respectively. These results are consistent with a previous study by Kolers (1963) and also with the CFM, as depicted in Figure 1.

Van Hell and de Groot (1998) used a discrete word-association task administered repeated times, with an interval of 1 month between sessions to examine the reliability of word association. In their study, they criticized earlier word-association research (e.g., Taylor, 1976) because when only two word-association sessions are conducted, one in each language, there is not a within-language, within-subject baseline with which to compare those results. So in a third session they administered the test in the same language as in the first session to a subset of their subjects. In that research, subjects were provided with a list of either Dutch or English words to which they had to associate either in Dutch or in English. The resulting conditions are represented in Table 1.

The conditions are Dutch stimulus−Dutch response (DD), Dutch stimulus−English response (DE), and so on. The groups of subjects in the same-language conditions during the first session (DD, EE) attended a third session. The results indicate that there was more overlap in the within-language sequences (DD−DD or EE−EE) than in the between-language sequences (DD−DE, DE−DD, EE−ED, ED−EE), thus lending some support to the CFM and the notion that the same word in different languages may be connected to different concepts. As in pre-

Table 1. Conditions in Van Hell and de Groot (1997)

	Session 1	Session 2	Session 3
Condition 1	DD	DE	DD
Condition 2	DE	DD	
Condition 3	EE	ED	EE
Condition 4	ED	EE	

vious research, the overlap was higher for concrete and cognate words than for abstract and noncognate words.

Although Van Hell and de Groot overcame one of the weaknesses of previous research, their measure, discrete word associations, was not a fully adequate representation of the richness of individuals' cognitive schemas. Discrete word associations only tap into the one conceptual node with the strongest link to the key words. All other concepts with possible links to the key words are not explored within subjects. Therefore, that method is only able to examine link strength, not the number of links originating in one concept. Discrete word-association tasks may be appropriate for studies like that of Van Hell and de Groot, where the goal is to examine the role of word characteristics like concreteness or cognate status. However, when the goal is to explore the existence of language-specific schemas, or to ascertain whether a specific stimulus activates different schemas depending on the language in which it is presented, continued word-association tasks provide a richer data base, including within-word, within-language, and within-individual variation. The present article, therefore, will suggest the use of a continued word-association paradigm to test the notion of language-specific schemas, as this is more appropriate for most marketing applications.

Another drawback of the Van Hell and de Groot (1998) study is that it did not include a DD–EE or an EE–DD sequence. This design characteristic has considerable importance for the proposed application of the word-association methodology, because one of the present goals is to explore the notion of language-specific schemas. When van Hell and de Groot compared the results of two sessions as in Condition 1 (see Table 1), in which the treatments were DD–DE, a confound may have been introduced. The stimuli for both sessions were presented in Dutch, but in the second-session subjects were required to answer in English. It is, then, unclear whether subjects were accessing concepts connected to the Dutch keyword or to its translation in English. This confound is of particular importance if it is considered that language serves as context for information retrieval (Anderson, 1983). Thus, comparisons between same- and mixed-language sessions like the ones in van Hell and de Groot may not be a valid test of the CFM. One cannot be sure of whether subjects are accessing Dutch- or English-specific concepts. The present article will attempt to overcome this drawback by suggesting that each session be conducted in only one language—both stimulus and responses should be in the same language.

Finally, a free-association methodology is described. Although free associations are appropriate in this case because consumers' unconstrained, automatic associations to key concepts are being explored, restricted associations can also be valuable for consumer researchers, particularly if they seek to find consumers' associations to brands with respect to specific attributes such as price, comfort, et cetera (see the foregoing discussion of frame theory).

To summarize, adapting methods from previous consumer behavior (see also Mitchell, 1982) and psycholinguistics studies, the present article will recommend a free-elicitation word-association methodology for studying bilinguals' cognitive structures. In particular, it will be suggested that consumer researchers seeking to explore the language specificity of cognitive structures combine the Van Hell and de Groot (1998) three-session methodology and Taylor's (1976) continued word-association task. In this manner, the proposed methodology complements past research by overcoming several of its drawbacks.

One advantage offered by the present methodology is the comparison of between-language word-association measures to within-language measures. This technique can test the conceptual overlap of between-language measures relative to within-language measures, can assess the reliability of word associations by comparing same-language sessions, and can validate the general predictions made by the CFM regarding the imperfect overlap between language-specific schemas. Second, the methodology explores the richness of bilingual consumers' cognitive structures by providing them with the opportunity to list more than one associate in response to each key word. As a result, researchers using this methodology will be able to examine the nature of the multiple associations to the same word. From these associations, a number of measures will be extracted to more appropriately test the notion of cognitive duality, or the existence of language-specific cognitive structures.

In addition, the methodology outlined in the next section will call for tasks in which both the stimulus and the response are in the same language (either English or Spanish) in each of the experimental sessions. This is a more appropriate method to test the CFM, because it eliminates the confound present in mixed-language sessions. Finally, the present methodology will also accomplish another objective: It will model a series of techniques that can be replicated with relative ease by researchers involved in cross-cultural marketing.

GUIDELINES FOR CONSUMER RESEARCHERS

It is proposed that a word association methodology can be used by consumer researchers to examine whether ad messages, brand names, or product descriptions have different meanings in different languages. This section offers a set of guidelines for the implementation of a methodology that has been used successfully in several tests and extensions of the CFM in a marketing context. As an example to help the reader visualize the issues addressed, a case will be examined in which a marketer has been using an advertising slogan in English that reads: "Sony is your friend."

Because the brand is actively pursuing the U.S. Hispanic market, a

direct translation of the slogan to Spanish is being considered as part of the promotional effort. The translation, seemingly straightforward, is "Sony es tu amigo." However, in this simple translation, an important assumption is made: gender. Should we choose the masculine *amigo* or the feminine *amiga*? What are the implications of choosing one over the other? Which one is the translation that is closest to the meaning of *friend*? Therefore, in this apparently simple example the researcher must address four issues: (a) whether either the feminine or the masculine Spanish translations have similar meanings to the English original, (b) which gender version is closest to the English original, (c) to what degree either translation is similar to the English original, and (d) where the possible meaning differences between the three words lie.

To address those questions, a word-association paradigm is proposed and its general characteristics are described. Continued word-association tasks are suggested, as opposed to discrete tasks. The former provide information about the number and nature of the links to the stimulus word, or key word. The latter only gives us information about the strongest link. Because our objective involves uncovering the schemas linked to each key word as completely as possible, the rich information provided by a continued association is preferable.

The need for a multiple-session methodology is stressed. As in Van Hell and de Groot (1998), sessions must be spaced over a relatively long period of time. Based on the authors' experience and the Van Hell and de Groot study, 1-month intervals between sessions is a reasonable period to prevent inference from the previous session. A multiple-session methodology will not only allow the researcher to examine the reliability of the procedure, but also to compare lists of associates within subjects. Given that there may be a great deal of variation between subjects in the number and type of elicited associates, a within-subjects comparison is critical when comparisons between a word and its translation equivalent are being made. Table 2 offers a possible research design.

In the example of Table 2, Conditions 1, 2, 5, and 6 contain the within-subjects comparison necessary to examine the possible differences between the three words, *friend, amigo,* and *amiga*. In addition, Conditions 3–6 will help the researcher test the reliability of the tests. By comparing the associates elicited by the same word in the same lan-

Table 2.   Example of Design for Between-Languages Comparisons

Condition	Session 1	Session 2	Session 3
1	S (amig**o**)	E (friend)	S (amig**a**)
2	S (amig**a**)	E (friend)	S (amig**o**)
3	S (amig**o**)	E (friend)	S (amig**o**)
4	S (amig**a**)	E (friend)	S (amig**a**)
5	E (friend)	S (amig**o**)	E (friend)
6	E (friend)	S (amig**a**)	E (friend)

Table 3.   Measures and their Applications

Measure	Research Questions
1. Number of associates	Which language includes the most conceptual links (i.e., the richest cognitive structures)?
2. List overlap	Within language: Is the procedure reliable?
	Between languages: Do the two translation-equivalent stimuli have similar meanings? To what degree?
3. Primary associate overlap	Within language: Is the procedure reliable?
	Between languages: Are the top-of-mind associates similar across languages? To what degree?
4. Qualitative analysis of lists and primary associates	What is the nature of the schemas linked to each translation equivalent? Are certain types of concepts more readily associated to stimuli in one of the languages?

guage on two different occasions, the test–retest reliability of the procedure can be assessed. In this example, a balance must be struck between the need to keep the study under a certain number of sessions and the need to have as many within-subjects observations as possible. Ideally, one would want to have one condition that includes all versions of the stimulus (*friend, amigo, amiga*) twice, to compare between and within language associations for all versions within subjects. However, that would involve six experimental sessions—probably too cumbersome and lengthy a study for most consumer researchers. Of course, cases in which the gender of the translation is not an issue may require much simpler designs—for example, only Conditions 3 and 5 may be required.

Regarding respondent selection, researchers must ensure that the sample of subjects they test is representative of their target market. Several dimensions emerge from the literature that must be taken into account when considering not only sample representativeness but also the type of responses individuals will produce in the word-association task. These dimensions include: language proficiency in each of the languages considered (Kroll & de Groot, 1997; Luna & Peracchio, 1999), level of acculturation of individuals (Deshpande, Hoyer, & Donthu, 1986), national origin (Guernica, 1982), gender (Meyers-Levy, 1989), age (Roedder-John & Sujan, 1990), method by which individuals learned their second language, and age at which they learned it (Grossjean, 1982). Thus, in order to be able to compare responses between subjects, researchers must control for these factors.

Several measures can be computed from this procedure to answer our research questions. Table 3 includes a list of measures and the research questions addressed by each measure. The first three measures are computed and analyzed at the individual level. That is, each subject is assigned a score indicating the number of associates he or she produced

in response to each stimulus word, to what degree all of his or her answers to the translation-equivalent words overlap across sessions, and whether the first associate produced for each translation-equivalent stimulus is the same across sessions. Following standard procedures in consumer research, all of the measures described in this section can be coded with the use of multiple judges.

List overlap and primary-associate overlap can be computed with the use of Taylor's (1976) methodology. Figure 2 includes an example of the coding method. It shows the responses to the words *Restaurant* and its Spanish-language translation equivalent *Restaurante* by one subject. The sameness, or translation equivalency, between words in different languages can be determined by consulting two multilanguage, in this case Spanish–English, dictionaries. If a word in List B is listed as a translation of the target word in List A at least in one of the dictionaries, it may be considered a translation equivalent. In addition to this rule, a number of consistent and reasonable rules will have to be created as ambiguous situations arise. For example, a word like *work* can be either a noun or a verb in Spanish. In this case, both the verb *trabajar* and the noun *trabajo* may be considered adequate translations of the word *work,* so if List A included *work,* and List B included either *trabajar* or *trabajo,* it can be considered an instance of overlap.

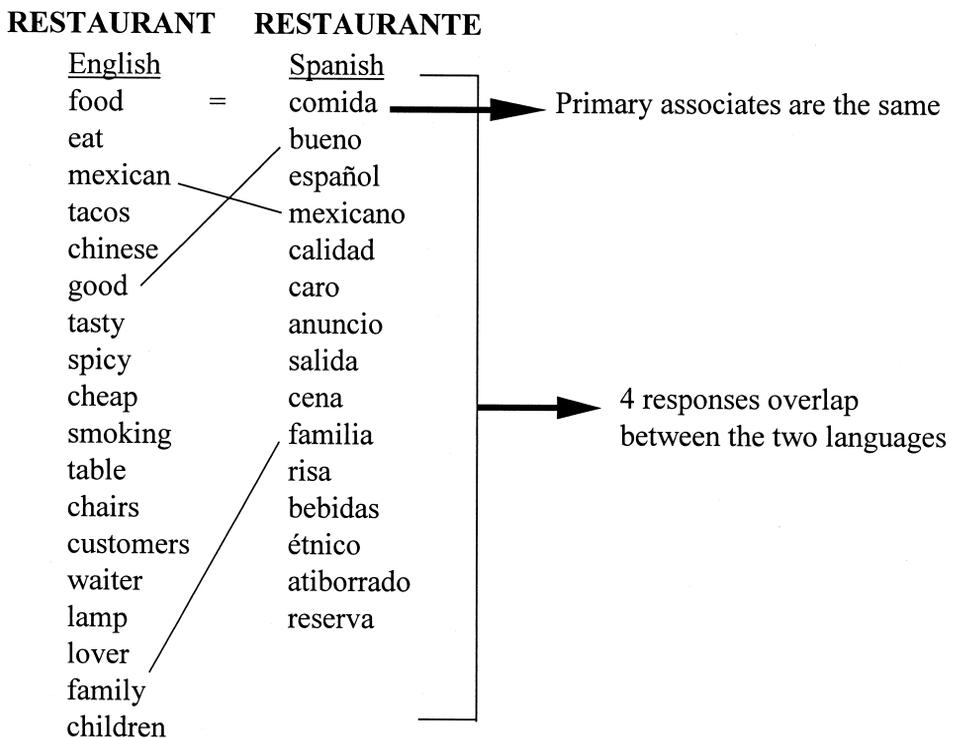**RESTAURANT   RESTAURANTE**

Figure 2.   Example of word-association scoring method.

After the scoring procedure, and following Taylor's (1976) methodology, overlap scores may be computed for each stimulus. Instead of raw overlap scores, analyses could be performed on the conditional probability that, given that a response occurred at all, it occurred in both languages. Probabilities can be calculated as follows:

$$P(Overlap)_{ij} = \left(\frac{N(Overlap)_{ij}}{N(Spanish)_{ij} + N(English)_{ij} - N(Overlap)_{ij}} \right),$$

where $i = 1, ..., 6$ conditions; $j = 1, ..., n$ subjects; N(English or Spanish) is the number of associates in English or Spanish, and N(Overlap) is the number of associates that overlap between sessions. The resulting measures can be analyzed in a multivariate repeated-measures design. For example, if one wanted to compare the masculine *amigo* to *friend,* one would select subjects in Condition 3. One would compare between-language overlap (overlap of Sessions 1 and 2) to within-language overlap (overlap of Sessions $1-3$). Primary-associate overlap is a straightforward measure. It can be computed by examining whether the first associate listed by subjects overlaps with the first associates produced in equivalent stimuli across sessions. A repeated-measures logistic regression analysis can be used to analyze the results.

In addition to these quantitative measures of overlap, a qualitative analysis of the word lists can be carried out. Such analysis would consist of inspecting the lists to code responses according to relevant word categories. For example, associates could be coded according to whether they are emotion, technical, financial, or culture-specific terms. The researcher can then determine if equivalent key words are linked to language-specific schemas. For example, English-language stimuli could be linked more frequently to technical terms, whereas Spanish-language stimuli may be linked more frequently to emotion concepts. This analysis can be performed at the individual level, similarly to the overlap measures, or at the aggregate level. In the latter case an aggregate list of all the associates produced by all the subjects in response to the key word(s) in each language would be constructed. Then, two judges would code the lists to see if certain categories of words or certain specific words appeared more frequently in one language than in the other.

CONCLUSION

This article emphasizes the importance of considering bilingualism in consumer research. Findings and models from bilingual research in psycholinguistics are highlighted, and some of their implications for consumer behavior are discussed. The article also provides a set of guidelines for consumer researchers interested in examining the cognitive

structure of bilingual individuals. The guidelines provide methodological recommendations that can be followed to investigate the nature of the meaning structures of bilingual individuals with respect to specific marketing stimuli.

The conceptual feature model is discussed as a theoretical basis for suggesting that bilingual individuals are characterized by a cognitive duality. In other words, different cognitive structures may be linked to each of the words in a translation-equivalent word pair. Word-association tasks can help consumer researchers identify the nature of these cognitive structures and the degree to which they differ. Therefore, this methodology can be used to determine how translated stimuli differ in meaning from original-language stimuli.

The proposed methodology is based on the close inspection of previous research in both psycholinguistics and marketing. The presented guidelines adapt the procedures of prior research studies providing the most reliable and valid results, and improve upon their shortcomings. In the end, the suggested word-association methodology can be readily utilized by consumer researchers and provides measures that help establish the reliability and validity of the procedure.

Implicitly, some directions for future research are provided. The presented methodology and its theoretical underpinnings can serve to examine research questions such as: If a word in one language (e.g., Spanish) can elicit more intense emotional responses than when it is presented in another language (e.g., English), what are the implications of mixing languages within an ad? Another possible direction for future researchers could be the combination of this methodology with other projective or survey techniques. Finally, and derived from the implications of the CFM, this article suggests a number of research directions for bilingualism, such as whether ads containing pictures (concrete ads) can produce a higher degree of overlap between languages than the same ads without pictures (abstract ads), or whether higher overlap results in a greater degree of memory. Altogether, and given the paucity of consumer research examining information processing by bilingual individuals, a great deal of work remains to be done in this area. Word-association tasks can help researchers in this endeavor.

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