Michel Paradis

Advances in the Neurolinguistics of Bilingualism

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Contents

3

Conceptual Change in Bilingual Memory: A NeoWhorfian Approach

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Among Paradis' major – but less known – achievements are his contributions to the study of conceptual representation in bilingual memory (Paradis, 1997a, b) and to the understanding of the relationship between bilingualism and linguistic relativity (Paradis, 1980). The purpose of this paper is to build on his proposals and to discuss ways in which recent research in the fields of bilingualism, and first and second language acquisition, allows us to see conceptual representations as partially language-related and as dynamic and subject to change in the process of second language (L2) socialization.

I will start out by defining concepts, situating them within a neo Whorfian framework, and describing the view of conceptual development and representation which emerges from current research on first language (L1) acquisition and linguistic relativity. Then, I will discuss the implications of this view for the relationship between bilingualism and cognition, suggesting that acquisition of an additional language in adulthood may lead to changes in one's conceptual representations. Subsequently, I will present a theoretical model for the study of conceptual change in bilingual memory, predicated on the neoWhorfian view of the relationship between language and cognition, and discuss research, including my own, which provides evidence of such a change. I will end by delineating some pitfalls and problems in this research and by proposing directions for the future study of conceptual change in bilingual memory.

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Conceptual Representations in a NeoWhorfian Framework

Definition of Concepts

In order to discuss conceptual development, we need first to adopt a definition of a concept. For the purposes of the present discussion, I see *concepts* as mental representations which affect individuals' immediate perception, attention, and recall, and allow members of specific language and culture groups to conduct identification, comprehension, inferencing, and categorization along similar lines. According to the concepts-as-theories view proposed by Keil (1989; 1994) and adopted here, these representations involve both domain-specific frequencies and correlations and domain-specific patterns of explanation. Furthermore, the view of concepts proposed here acknowledges that conceptual representations are based on both linguistic and perceptual bases and distinguishes between language-based (or language-related) concepts and concepts not immediately linked to language for which language users may have a mental representation but no specific linguistic means of encoding (for an in-depth discussion, see Pavlenko, 1999). Focusing on the former, I differentiate between lexicalized and grammaticized concepts: *lexicalized* concepts refer to lexically encoded items, such as natural objects, artifacts, substances, events, or actions, while *grammaticized* concepts refer to notions encoded morphosyntactically, such as number, directionality, tense, or aspect (for an in-depth discussion of grammaticized concepts, see Slobin, 2001). Clearly, many complex conceptual domains, such as spatial or temporal, rely on both types of concepts. For instance, in many satellite-framed languages, such as English, motion is encoded both lexically and grammatically: the manner of motion is expressed lexically through verbs of motion, while directionality, or motion path, morphosyntactically through prefixes or particles (e.g., crawl INTO the house) (Slobin, 2000). Finally, the view adopted here also acknowledges that in some aspects mental representations may differ from individual to individual; moreover, in a single individual the same words or forms may elicit different representations in distinct contexts (Pavlenko, 2000). The focus of the present paper, however, is not on these individual differences but on the common conceptual core which allows for sustained communication between speakers of the same language.

Conceptual representations and linguistic relativity

Studies in first language acquisition and in linguistic anthropology demonstrate that languages may differ in the encoding of both lexicalized and grammaticized concepts, and that in some cases these differences have cognitive effects on the speakers, whereby monolingual speakers of particular languages perform differently on various categorization, inferencing, or memory tasks (Imai, 2000; Kronenfeld, 1996; Lucy, 1992b; Lucy & Gaskins, 2001; Slobin, 2000; Pederson et al., 1998). For instance, Lucy (1992b) found that differences in the nominal number marking between English and Yucatec Maya led speakers of the two languages to perform differently on recall and categorization tasks. In particular, in memory tasks involving complex pictures, English speakers turned out to be sensitive to number for both animate entities and objects but not for substances, as opposed to Yucatec Maya speakers who were sensitive to number for animate entities but not for objects (precisely where the two grammars are at maximal contrast). Pederson et al. (1998) established that cross-linguistic differences in spatial encoding influence ways in which individuals conceptualize and memorize spatial distinctions for non-linguistic purposes, as seen in their performance on recall, recognition, and inference tasks.

These and similar studies are seen as supporting the Sapir-Whorf hypothesis, also known as the theory of linguistic relativity, which proposes that the particular language we speak influences the way we think about reality. Recently, there has been a new surge of interest in the theory of linguistic relativity that has led to a number of innovative theoretical proposals and empirical studies in the field (Bowerman & Levinson, 2001; Gumperz & Levinson, 1996; Lucy, 1992a, b, 1996, 1997; Niemeier & Dirven, 2000; Nuyts & Pederson, 1997; Pütz & Verspoor, 2000). What is particularly impressive about this work is the fact that the new studies in the neoWhorfian paradigm go beyond simple cognitive appraisals, such as color sorting tasks, instead favoring complex assessments, consisting of a variety of non-verbal tasks, from categorization to memorization to role play. Moreover, some researchers argue that categorization behaviors per se tell us little about the basis on which judgments are made and are not sufficient evidence of conceptual understanding since in some cases conceptual structures are more like theories rather than simply rules (Hampton, 1997). They also acknowledge that many domains of experience are primarily or ex-

clusively verbal and to assess differences in such situations, it is necessary to employ verbal measures to show how thought operates in these domains (Imai, 2000; Lucy 1992a, 2000). As a result, in the more recent studies researchers appeal to triangulation, bringing together evidence from non-verbal performances together with verbal responses to specific elicitation stimuli (picture, picture book, film, object or series of objects) (e.g., Imai, 2000; Lucy, 1992b; Slobin, 2000). In order to contextualize these performances in wider sociocultural practices, some scholars also appeal to the examination of discursive practices of particular communities and to the systematic analysis of the patterns in question in creative fiction, translation, spontaneous conversation, mental imagery, and gesture (e.g., Slobin, 2000).

First Language Acquisition and Conceptual Development

Particularly convincing evidence for linguistic relativity comes from recent studies in first language acquisition and conceptual development which demonstrate that children from different linguistic backgrounds exhibit significant differences in verbal and non-verbal performance in the domains differentially encoded in their respective languages. I will discuss some of the more recent studies in detail as their findings have important implications for the study of bilingual linguistic and conceptual development both in children and adults.

Lexicalized concepts are investigated by researchers who study nominal classification and individuation in *object-kind-centered* languages which have objects and individuals as a primary reference (e.g., English) and *material-kind-centered* languages which have substances as a primary reference (e.g., Japanese, Yucatec Maya) (Gentner & Boroditsky, 2001; Imai, 2000; Lucy & Gaskins, 2001). Imai (2000) demonstrated that young Japanese- and English-speaking children learn to distinguish objects and substances in different ways as they acquire their languages. Since English obligatorily makes a singular/plural distinction and marks the status of an entity with respect to individuation, speakers of English view most nouns as either count or mass nouns (i.e., objects or substances). In contrast, Japanese does not make the singular/plural distinction and is significantly less likely to mark the status of an entity with respect to individuation. When individuation marking is required, speakers of Japanese use classifiers; the use of classifiers is, however, not obligatory. As a result, the speakers of the two languages may differ with regard to habitual attention paid to shape (preferred by the speakers of English) and material composition or substance (favored by the speakers of Japanese). This is indeed what was found in a series of verbal and non-verbal categorization studies conducted by Imai (2000) with Japanese- and English-speaking children and adults. The experiments demonstrated that all participants construed complex objects as individuated. The groups differed, however, with respect to their treatment of simple objects and substances. While American subjects, from 2-and-a-half-years of age onward construed simple objects as individuated and extended word labels on the basis of shape, Japanese children responded at chance level (50%) and could not determine whether the entities should be construed as objects or substances, and Japanese adults exhibited a preference for substance construal. Predictably, the results were reversed in the substance trials, where Japanese subjects favored substance construal, while American subjects showed a random shape/material response (50%). It is interesting to note also that adults in both groups performed consistently on linguistic and non-linguistic tasks, while children exhibited more language-specific patterns in the verbal tasks. According to Imai (2000), this discrepancy may indicate that children develop a bias toward language-specific grammatical categorization in the context of word-learning and only later does this bias penetrate the domain of more general cognition. This suggestion is also borne out in a study by Lucy and Gaskins (2001) who compared object categorization patterns by children speaking American English and Yucatec Maya, a classifier language similar to Japanese. The researchers found that at 7 years of age both groups of children similarly favor shape over material, but at 9 years of age the bias toward shape-based classification decreases significantly among the Yucatec children (who like Yucatec adults now favor substance-based classification) but remains constant among the English-speaking children (who like English-speaking adults continue to opt for shape-based classification). Together, the results of the studies above suggest that researchers need to be sensitive both to age effects in conceptual development and to age effects in linguistic and non-linguistic performance.

A series of studies by Slobin and associates (Slobin, 1996; 2000) focus on ways in which movement is encoded in different languages and conceptualized by the speakers of these languages. The multidimen-

sional representation of movement is extremely complex and involves such diverse factors as muscular patterns, rate, force dynamics, and social-emotional evaluation. Different languages apportion this multidimensional psychological space in different ways, in particular with regard to the change of location. *Satellite-framed* languages focus on manner of motion and provide its path in a satellite of the verb (prefixes or particles), while *verb-framed* languages indicate the path through the main verb. As a result, speakers of satellite-framed languages represent manner and directed motion as a single conceptual event, making it difficult to have a mental image of one without the other, while users of verb-framed languages build mental images of physical scenes with minimal focus on manner of movement, and with rather different conceptualization of manner when it is in focus. Speakers of satellite-framed languages also tend to pay more attention to motor patterns, rate, and quality of movement than speakers of verb-framed languages. This, according to Slobin (2000), means that children who speak verb-framed languages are not trained by their language to distinguish, for instance, between crawling and creeping, or falling, flopping, and tumbling in a categorical way. The evidence for these differences in conceptualization and resulting verbal performances comes from empirical studies of oral and written narratives elicited by a common stimulus from speakers of several satellite-framed (English, Russian) and verb-framed (Spanish, French, Italian, Turkish, Hebrew) languages, as well as from the analysis of mental imagery elicited from speakers of these and other languages, and from the examination of verb usage in literary novels (and their translations) and in spontaneous conversations in these and other languages (Slobin, 2000).

Finally, Bowerman and Choi (Bowerman, 1996a, b; Bowerman & Choi, 2001; Choi & Bowerman, 1991) looked into ways in which learners of verb-framed and satellite-framed languages, such as Korean and English, acquire spatial representations. Their studies have established that Korean- and English-speaking children exhibit language-specific – and different – patterns of spatial organization. Looking at spontaneous speech samples, collected longitudinally from children learning various languages by means of videotaping and tape recording, as well as at samples collected from children and adults through elicitation procedures, the researchers established that utterances of 18-month-old children already reflect a profoundly language-specific spatial organization. For instance, English-learning children used the preposition 'in' both when they climbed into the bathtub and put magnetic letters into a small box; in contrast, children acquiring Korean as a first language used the verbs *tule* (enter) and *nehta* (put loosely in or around) in comparable situations, making a distinction between motion paths required by Korean. Similarly, English learners distinguished systematically between putting things into containers of all sorts (in) and putting them onto surfaces (on), but were indifferent to whether the figure fit the container tightly or loosely; in contrast, Korean-speaking children distinguished between tight and loose containment, using appropriate verbs *kkita* (fit tightly) and *nehta* (put loosely or around).

While it is becoming increasingly clear that language socialization, and in particular, language-specific concept encoding, constitutes a major shaping force in children's conceptual development and in adult's conceptual representations, current empirical work on linguistic relativity has little if anything to say about ways in which language affects cognition in adult – or even childhood – bilinguals. As I have argued elsewhere (Pavlenko, 1999; 2000; in press), the interaction between languages and cognition in bilingualism could be explored in a variety of ways. The focus of the present paper is on one particular aspect of such interaction - conceptual change that may take place when adults begin to learn and use a new language which provides them with categories and concepts distinct from those encoded by their L1.

Linguistic Relativity and Concepts in Bilingual Memory

Paradis (1980) was one of the first scholars to explore the implications of linguistic relativity for bilingualism, refuting Macnamara's (1970) suggestion that if the Whorfian hypothesis were true, bilinguals would be doomed, having to conform to one of the following three patterns: (1) 'think' in their L1 when speaking either L1 or L2, and, thus, have difficulties in communicating with the L2 speakers; (2) 'think' in a 'hybrid' manner, appropriate to neither language, and run the risk of not being able to communicate with anyone; (3) have two semantic systems, appropriate to their two languages. The third possibility, according to Macnamara (1970), means that they will 'think' differently depending on what language is used, and, consequently, (a) have difficulties in 'communicating' with themselves, and (b) translating into one language

what was said in another. (In a later paper, Macnamara (1991) took a less radical view and suggested that in the third case the bilinguals will be able to translate and to communicate with speakers of either language.) Paradis (1980) argued that while the first two options and difficulties with translation are indeed the case, none of the cases described could be used to refute the Whorfian hypothesis *ad absurdo*. If we consider different types of bilingualism, all three options are possible and, if anything, they support and not refute the Sapir-Whorf hypothesis. His rebuttal inspired many other scholars – including the present author – to rethink the implications of linguistic relativity for the study of bilingualism and cognition.

The first situation, described by Macnamara (1970; 1991), corresponds to what is known as *subordinate* or functional bilingualism, when the conceptual system of L1 underlies both lexicons or, in other words, when the meaning for the L2 is supplied by the L1. Undoubtedly, even quite proficient learners may have trouble communicating with the speakers of their L2 due to differences in their concepts, metaphors, interpretive frames and conversational strategies. The field of SLA abounds in research that documents conceptual transfer from L1 into L2 in a variety of contexts (e.g., Becker & Carroll, 1997; Graham & Belnap, 1986; Jarvis, 1998). A good example is a study by Graham and Belnap (1986) which demonstrated that Spanish learners of English tend to follow the L1 categorization patterns in their L2, where the two languages are in disagreement (e.g. in the case of boundary differences between the English *chair*, *stool*, and *bench*, and the Spanish *silla* and *banco*).

The second case, described by Macnamara (1970; 1991), corresponds to *compound* bilingualism, often seen as a blend of two conceptual systems. This blend or 'hybrid' is quite typical of minority communities in language contact situations and of particular groups of bilingual and bicultural individuals whose conceptual representations may be distinct from those of monolingual speakers of the respective languages (e.g., Monti-Belkaoui & Belkaoui, 1983; Yoshida, 1990). The existence of such subcultures, however, problematizes the view of strict boundaries between languages and cultures, rather than the Sapir-Whorf hypothesis. From a language contact perspective, Gomez-Imbert's (1996) diachronic study of conceptual categories in multilingual contexts suggests that in some contact situations incompatible classification systems may break down and undergo simplification in order to achieve some type of similarity, while in other contexts a classificatory pattern may be imported from one language into another.

The third situation, depicted by Macnamara (1970), corresponds to *coordinate* bilingualism, and, at times, indeed may lead to difficulties with translation, particularly visible in the case of bilingual writers (Pavlenko,1998). According to Paradis (1980; 1997b), it is these bilinguals who will behave differently, depending on the language in which, for instance, they are told to bring back the balls – or *les balles* – from the closet. If the command was issued in French, they will gather tennis balls, cricket balls, and small rubber balls; if the command was issued in English, they would also include volleyballs, basketballs, and footballs. In this case, the English 'ball' corresponds to two categories in French: small balls (*les balles*) and big balls (*les ballons*). Similarly, if asked 'give me all the cups and leave the glasses on the table,' coordinate Russian-English bilinguals would gather the porcelain, ceramic, plastic, and paper cups; if asked to perform the same action in Russian ('*dai mne vse chashki i ostav' stakany na stole*'), they would leave the paper and plastic cups on the table together with the glasses. This difference is due to the fact that even though the English 'cup' and 'glass' each have only one Russian translation equivalent, respectively, *chashka* and *stakan*, in English 'glass-ness' is defined by the material, while in Russian its defining characteristic is shape and the absence of handles (on plastic glasses, see also Kronenfeld, 1996). As a result, paper cups in Russian are *bumazhnye stakanchiki* ('paper glasses', literally 'little glasses', as one also has to mark the size with a diminutive suffix). Several studies document that coordinate bilinguals not only perform differently in different languages (e.g., Koven, 1998), but that they also have different mental imagery attached to 'translation equivalents' in different languages (e.g., Bugelski, 1977; Lambert et al., 1958; Winograd et al., 1976). In a recent study by Slobin (2000) Spanish-English bilinguals reported to have more manner of motion imagery in English (a satellite-framed language where manner of motion is lexicalized and thus represents an important category to focus on) than in Spanish (a verb-framed language, where manner of motion is not a salient category).

In his own work, Paradis (1997a, b) very thoroughly incorporated and acknowledged various differences that may exist in the conceptual representations of bilingual individuals. His model of bilingual

memory distinguishes between the semantic and conceptual levels of representation, whereby semantic constraints, which are part of linguistic competence, activate conceptual features, necessary to obtain a mental representation of the referent (object, quality, event, etc.). Consequently, 'translation equivalents' that differ in their semantic constraints will activate distinct conceptual representations, and so will polysemous words. This model, however, is a static one which favors bilinguals who are more or less bicultural in their two languages. In what follows, I will expand this model and propose a dynamic approach to bilingual memory which allows us to examine a transition from a subordinate to a mixed (i.e., subordinate, compound and coordinate) set of representations.

In order to look at such a transition, I will focus on late or adult bilinguals who learned their second or additional language post puberty, as adults, and are in the process of becoming culturally competent members of the target language community. The key adjustment necessitated in this acculturation is a reconstruction of conceptual representations – or at least the addition of new ones – whereby, in order to be fully understood and not misinterpreted, the L2 users need to learn to categorize objects, events, and actions along the lines of their new language. Clearly, in each individual case, the two languages and cultures involved will share some similarities which will facilitate initial learning and interaction. It is equally clear that each case of additional language learning and use will entail some conflicts between competing conceptual representations which will require adjustments on the part of L2 users (or result in continuous L1 transfer impeding communication with the L2 speakers). These adjustments allow us to see a unique effect of linguistic relativity, in some ways similar to – and in some ways completely distinct from – those observed in the study of L1 acquisition and conceptual development. This effect which reflects the impact of new linguistically encoded concepts on already existing conceptual representations is theorized here as *conceptual change*. Undoubtedly, all adults experience conceptual development and change as part of their educational and life trajectories; second language socialization, however, allows us to see a magnified effect whereby the fully fluent use of the second language may require developing an additional set of conceptual representations, which may co-exist, compete with,

and at times even replace the ones already stored in an individual bilingual's memory.

Conceptual Change in Late or Adult Bilinguals

Theoretical Framework for the Study of Conceptual Change

The purpose of this section is to propose a theoretical model for the study of conceptual change in bilingual memory which builds on my previous proposals (Pavlenko, 1999; 2000; Pavlenko & Jarvis, 2000). As indicated earlier, the theoretical model proposed here distinguishes between language-related (or language-based) concepts and concepts not immediately linked to language, and focuses on the former category. The category of language-based concepts includes both lexicalized and grammaticized concepts, which underlie and directly govern the use of surface linguistic forms, including lexical items, morphology, syntax, and discourse structures. Previous research convincingly demonstrates that language-based concepts internalized in the process of first language acquisition guide, at least initially, L2 users' attempts at identification, comprehension, inferencing, and categorization undertaken in the L2 (or any new or additional language) (Becker & Carroll, 1997; Graham & Belnap, 1986; Ijaz, 1986; Jarvis, 1998; Pavlenko, 1997, 1999; Pavlenko & Jarvis, 2000).

At the same time, numerous cases of successful second language acquisition by adults demonstrate that concepts may be restructured in the process of second language learning and socialization and that L2-based concepts may start influencing L1 performance (Pavlenko, 1999; 2000; 2002b). Previous research has uncovered several instances of conceptual change, which will be discussed below. The verbal and non-verbal manifestations of such change, however, have never been put together with conceptual processes into a coherent framework of the kind proposed here (for a slightly different version of this argument see Pavlenko & Jarvis, 2000).

Table 1 illustrates the framework I propose, differentiating between: (1) conceptual processes, (2) motivations underlying these processes, and (3) verbal and non-verbal manifestations of the particular processes. Conceptual change, which may take place in one or more conceptual domains, is viewed here as involving one or more of the following

processes: (1) internalization of L2-based concepts; (2) restructuring, whereby new elements are incorporated into previously existing concepts or conceptual domains; (3) convergence, whereby a unitary concept or conceptual domain is created, distinct from both L1- and L2-based concepts; (4) shift from L1- to L2-based conceptualization within a particular domain; and (5) attrition of previously learned concepts, not relevant for one's daily interaction, often accompanied by a substitution of the previous concepts with the new ones. It is necessary to emphasize here that these processes do not necessarily occur in any chronological order and that different processes may be occurring at the same point in time in different conceptual domains. The few available studies discussed below represent cross-sectional evidence of conceptual change. In order to better capture the nature of such a change, future research will have to incorporate longitudinal case studies of individuals undergoing the process of L2 socialization.

In what follows, I will explicate the meaning of each category, discuss what could count as evidence of the process in question, and present existing studies that may throw some light on this process.

Table 1. Typology of conceptual change in bilingual memory.

Processes	Motivation	Verbal and non-verbal manifestations
Internalization of L2 concepts	- need to name new objects and concepts - need to differentiate similar concepts (or to replace those becoming obsolete) - sociopsychological need for a more or less neutral item	- mental imagery consistent with that of L2 speakers *L2 influence on L1 use:* - code-switching - lexical borrowing - semantic extension & shift - loan translation & calques - framing transfer *Verbal performance:* - word associations, labeling and recall consistent with patterns exhibited by monolingual L2 speakers and distinct from those exhibited by monolingual L1 speakers *Non-verbal performance:* - non-verbal categorization patterns consistent with those exhibited by monolingual speakers of the L2 and distinct from those exhibited by speakers of the L1
Restructuring under the influence of L2	- need to express new and/or additional meanings - need to differentiate one meaning from another	- mental imagery that incorporates some aspects of L2-based concepts *L2 influence on L1 use:* - semantic extension - loan blends - framing transfer *Verbal performance:* - word associations, labeling and recall patterns distinct from those exhibited by monolingual L1 speakers *Non-verbal performance:* - non-verbal categorization patterns distinct from those exhibited by monolingual speakers of L1
Convergence	- resistance to, or lack of necessity to maintain two separate conceptual domains	- mental imagery distinct from that elicited from L1 and L2 speakers *Bidirectional influence:* - semantic shift - semantic extension - semantic narrowing *Verbal performance:* - word associations, labeling and recall patterns distinct from those exhibited by monolingual speakers of L1 and L2 *Non-verbal performance:* - non-verbal categorization patterns distinct from those exhibited by monolingual speakers of the L1 and L2
Shift from L1 to L2	- interactional constraints whereby reliance on L1 concepts would result in miscommunication	- mental imagery consistent with that elicited from monolingual L2 speakers *L2 influence on L1 use:* - semantic extension & shift - semantic narrowing - prototype shift - category boundary shift - framing transfer *Verbal performance:* - word associations, labeling and recall

Processes	Motivation	Verbal and non-verbal manifestations
		consistent with patterns exhibited by monolingual L2 speakers and distinct from those exhibited by monolingual L1 speakers *Non-verbal performance:* - non-verbal categorization patterns consistent with those exhibited by monolingual speakers of the L2 and distinct from those exhibited by speakers of the L1
Attrition of L1 concepts	- lack of need for particular concepts in one's daily interaction	- lack of mental imagery *L2 influence on L1 use:* - code-switching - lexical borrowing - semantic shift - framing transfer *Verbal performance:* - consistent absence of labeling and recall patterns exhibited by L1 speakers *Non-verbal performance:* - consistent absence of non-verbal categorization patterns exhibited by monolingual L1 speakers

Internalization of L2 Concepts

The first process in conceptual change, *internalization* of language-specific concepts, does not require introduction in the study of bilingualism. An encounter with a new language and culture is often also an encounter with new objects, categories, event types, or abstract concepts which have to be incorporated in previously existing conceptual networks. These new concepts may be easy to acquire (at least partially), since they do not have any competition in the conceptual store and are salient as a result (Kecskes & Papp, 2000).

What can be seen as evidence of incorporation of new concepts in an individual's conceptual representations? One way to explore internalization is to conduct a contrastive language assessment and then see if concepts shown to be language-specific are being used by individuals performing in an L2 context, both in verbal and non-verbal performance. My own work with late Russian-English bilinguals

(Pavlenko, 1997; 1999) provides evidence of such internalization whereby several bilinguals patterned with the monolingual speakers of English in their recalls of a short film which portrayed an encounter between a male and a female. While Russian speakers perceived the encounter uniformly as a 'pick-up', monolingual speakers of English and several bilinguals discussed it in terms of 'an invasion of personal space' or 'privacy.' These notions are absent from contemporary Russian language and culture, and are internalized by Russian L2 users in the process of L2 socialization. Similarly, one could compare bilinguals' patterns of performance on non-verbal tasks and see, for instance, if Russian-English bilinguals categorize their cups and glasses consistent with the linguistic context of the task, or if Japanese-English bilinguals shift their preferences for shape vs. substance in different linguistic contexts. One could also examine whether late bilinguals have mental images related to the concepts in question and if these images are similar to those described by monolingual speakers of the L2.

Another possibility is to look at ways in which new conceptualizations influence the individual's performance in the first language. One such manifestation is lexical borrowing in language contact situations, a phenomenon well documented in the literature on bilingualism (Andrews, 1999; Appel & Muysken, 1987; Haugen, 1953; Jaspaert & Kroon, 1992; Otheguy & Garcia, 1988, 1993; Romaine, 1995; Weinreich, 1953). At times, conceptually-driven lexical borrowing stems from the immigrants' need to name objects or notions unique to the L2 environment and culture. At other times, borrowing reflects the immigrants' perception that the L1 'translation equivalent' is inadequate to fully express the L2-based concept, or that the two differ in connotations. For instance, Otheguy and Garcia's (1988) interviews with Cuban immigrants in Dade County, Florida, suggest that, for these budding bilinguals, Spanish lexical items are incongruent with their US experiences. To give an example, the standard Spanish term for 'job application', *solicitud*, corresponded in their minds to a much more informal and carefree application process than the one they encountered in the US. As a result, they have adopted *applicación* to refer to the more scripted and bureaucratic US experience. Similarly, a late Russian-English bilingual in Pavlenko and Jarvis's (2000) study used the English word *landlord* when telling a story in Russian about an American context and then corrected herself by providing the se-

mi-appropriate Russian word *domovladelets* ('homeowner'). While this word is the closest translation equivalent of *landlord*, it is regarded by Russian speakers – many of whom came to the US before or immediately after the collapse of the Soviet Union – as reflecting a very different notion, a capitalist, or a historic figure of pre-revolutionary times. Therefore, Russian speakers often judge the Russian translation equivalent to be inappropriate for a discussion of contemporary American landlords (see also Andrews, 1999).

Lexical borrowing is not the only linguistic manifestation of the internalization of new concepts. These concepts may also appear in the form of code-switching, semantic extension, semantic shift, loan translations, calques, and framing transfer, all of which may point to conceptually-driven L2 influence on L1 use. For example, some of the Russian-English bilinguals in my study (Pavlenko, 1997; 1999) also attempted to incorporate the new concepts of 'personal space' and 'privacy' in their Russian narratives. These attempts at times resulted in loan translations, such as *on vtorgaetsia v ee odinochestvo* ('he is invading her privacy', literally: solitude).

Restructuring

Another possible outcome of the L2 socialization process is *conceptual restructuring* whereby an encounter between two competing conceptual representations results in a partial shift from the L1- to L2-based conceptual representation. As a result, newly formed concepts do not fully approximate the L2-based ones but rather acquire some new dimensions (initially, perhaps the most salient ones). Restructuring is particularly evident in semantic extensions where L1 words acquire new meanings – and L1-based concepts change their internal structure – under the influence of the L2 (without, however, losing L1-specific meanings). Clearly, not all instances of semantic extension are evidence of conceptual restructuring. Future research will need to distinguish between restructuring at the semantic level whereby new links and constraints are created and restructuring at the conceptual level which will have implications for both linguistic and non-linguistic performance. One example of a change at the semantic but not conceptual level is a shift in the meaning of the verb *correr* ('to run') in the language of the Cuban immigrants in the US. In standard Spanish, *correr* has the meaning of moving rapidly, while in the language of

Cuban immigrants, under the influence of English, it has also acquired the metaphoric meaning of running for office, e.g. *correr para gobernador* 'to run for governor' (Otheguy & Garcia, 1988). This semantic change, however, did not affect the conceptual structure of *correr* as a verb of motion. What would be seen as evidence of conceptual restructuring is an attempt on the part of a Spanish-English bilingual to make manner of motion distinctions with regard to running which are not encoded in Spanish, a verb-framed language.

Another linguistic manifestation of conceptual restructuring is framing transfer, which, in the case of negative transfer involves the inappropriate use of linguistic (both semantic and syntactic) frames from one language in order to linguistically encode the message in another. Restructuring could also be evidenced in loan blends which combine components of both conceptual representations. An interesting example of this comes from my study of bilingualism and emotions (Pavlenko, 2002b) where one Russian-English bilingual produced a loan blend, *on vtorgaetsia v ee emotsii* ('he is invading her emotions'), mixing the American concept of invasion of things private (which include space) with a more Russian understanding of things private as limited to emotions. Finally, restructuring could also be examined in mental imagery and non-verbal tasks where late bilinguals would be expected to have internalized some – but not all – aspects of their L2-based concepts.

Convergence

Yet another possible process in conceptual change is *convergence* between the two systems, whereby a unitary conceptual item or domain is created, distinct from that occurring in either strictly L1-based or L2-based systems. Linguistic manifestations of convergence include semantic shift, semantic extension, and, most often, semantic narrowing where only the features common to both languages and cultures remain represented. In non-verbal performance, convergence will be exhibited in categorization or inferencing patterns distinct from those exhibited by monolingual speakers of both the L1 and the L2 and, once again, combining features common to both.

The idea of convergence – oftentimes referred to as shift – is not new: it has been discussed by Weinreich (1953) and Haugen (1953) and documented by Ervin-Tripp (1961), who found that color cate-

gories used by Navaho-English bilinguals differed systematically from the monolingual norms in the respective languages. Ervin-Tripp's (1961) findings were confirmed in a study by Caskey-Sirmons and Hickerson (1977), who compared the color categories used by monolingual speakers of Korean, Japanese, Hindi, Cantonese, and Mandarin with those used by speakers of these languages who learned English as their L2 in adulthood. The researchers found that late bilinguals mapped larger total color areas, had less stable color category boundaries and more variable category foci than monolingual speakers.

Some convergence at the level of word associations was found by Yoshida (1990) who compared word associations of 35 Japanese college students – who at one time or another had lived in the United States and attended American schools – to those of Japanese and English monolinguals. Four categories of words were selected for the test: nature (e.g., *haru* 'spring'), daily life (e.g., *sensei* 'teacher'), society and ideas (e.g., *seifu* 'government'), and culture (e.g., *shougatsu* 'New Year's Day'). The bilingual subjects were asked to provide word associations in Japanese to the Japanese stimuli and in English to the English stimuli. On some items in the four categories the bilinguals patterned with the monolingual Japanese informants; on others, however – in particular, in the culture category – the participants' responses turned out to be different from those of both the Japanese and the English monolingual control groups, which suggests that convergence of semantic networks may be taking place for these bicultural bilinguals.

Conceptual Shift

Another possibility is that interactions in the new environment will lead to *shifts* from L1- to L2-based concepts in various conceptual domains. Most often, this happens with immigrants who have spent a significant amount of time in the target language community and are undergoing the process of L1 attrition. Conceptual shift may be evident in semantic extension or narrowing, it may also be exhibited as a shift of typicality, category prototypes or category boundaries.

Shimron and Chernitsky (1995), for instance, compared typicality ratings for items in several categories (sports, fruit, food, science, vegetables, vehicles, beverages, diseases) provided by native speakers of Spanish in Argentina, native speakers of Hebrew in Israel and Jewish immigrants from Argentina currently residing in Israel. They found

that a typicality shift took place among immigrant subjects, reflecting the change and adaptation processes that result from cultural transition. In particular, certain sports (basketball and weight lifting), fields of science (chemistry and geology), fruit (avocado) and diseases (malaria) were perceived as much more typical than they were by Spanish speakers living in Argentina.

Evidence of shift in word associations comes from a study conducted by Grabois (1999). In this study, Grabois compared word associations to a number of concepts, including *love*, *fear*, and *happiness*, provided by monolingual speakers of Spanish, monolingual speakers of English, acculturated L2 users of Spanish who had lived in Spain for 3 or more years, L2 Spanish learners enrolled in a study abroad program, and FL Spanish learners enrolled in Spanish courses in an American university. Statistical analysis of the data demonstrated that associations supplied by the two groups of native speakers differed both in terms of the type of preferred associations (i.e., symbolic, metaphoric, related to sensory cues, etc.) and in terms of which specific words were elicited. For instance, in response to 'love', native speakers of English exhibited a greater preference for indirect – metaphoric and symbolic – associations, while native speakers of Spanish showed a preference for sensory and referential associations. Among the non-native speakers of Spanish, acculturated L2 users, or late bilinguals, consistently achieved higher correlations with the associations provided by native speakers of Spanish than any other group, thus, suggesting that in the process of acculturation their mental representations of emotions have undergone a conceptual shift.

In my own work with Russian-English bilinguals, I also found evidence of conceptual shift in mental representations of emotions, exhibited in linguistic framing. Previously, Russian and English were shown to represent emotions differently (Wierzbicka, 1992). In English emotions are usually conceptualized as passive states caused by external and/or past causes, while in Russian experiences comparable to 'anger', 'happiness,' or 'concern' are often conceptualized as inner activities in which one engages more or less voluntarily. These differences correspond to different patterns of linguistic framing of emotions: in English, they are commonly expressed by means of adjectives and pseudo-participles (e.g., she is upset), and in Russian they are often designated by verbs (e.g., *ona rasstroilas'* 'she got upset'). Russian

speakers not only use more verbs than adjectives in their references to emotions but they also favor imperfective and reflexive verbs which emphasize the processual aspect of the experience. Empirical work confirms that these patterns are closely adhered to in the speech of Russian and English monolinguals (Pavlenko, 2002a). My analysis of the narratives of late Russian-English bilinguals demonstrated that some bilinguals are in the process of conceptual shift. Not only do they favor adjectival patterns in English, but in Russian they also attempt to appeal to state verbs to frame emotions as states rather than actions and, as a result, produce instances of morphosyntactic L2 transfer. For instance, one participant remarked that the woman in the film *stala eshche bolee rasstroennaia* ('became even more upset'), whereas monolingual Russian participants described the same woman using action verbs: *ona rasstroilas'* ('she [got] upset').

In addition, some of these late bilinguals appear to have shifted the category boundaries of some emotion categories. For instance, Russian has three translation equivalents of angry – *serdityi* ('cross', 'angry at the moment'), *zloi* ('malicious', 'very angry', 'mean' (typically used as a personality characteristic)), and *gnevnyi* ('irate', 'in wrath') – each adjective being more intense than the preceding one. Russian monolinguals favored the first term *serditaia* ('cross', FEM) in their narratives. In contrast, some Russian-English bilinguals appear to have collapsed the distinctions, as they used the short adjective *zla* ('malicious', 'angry,' FEM) in describing the main protagonist. Another case where the English concept appears to influence the use of a Russian word is the notion of *schast'ie* ('happiness'). In Russian, the adjective *schastlivyi, -aia* ('happy') is used to describe a lasting state of happiness, while the English 'happy' has a much wider range of usage and may be used to mean 'pleased' or 'satisfied'. One Russian-English bilingual in the study has substituted the English concept for the Russian one, talking about the woman being *schastlivaia* ('unhappy,' FEM) in the context where Russian monolinguals would use the short adjective *nedovol'na* ('dissatisfied,' FEM).

Conceptual Attrition

Finally, the last possible outcome of the interaction between competing conceptual representations may be the process of *attrition* of certain concepts, at times accompanied by *substitution*. While formal aspects of attrition have been well documented in the literature (e.g., Waas, 1996), conceptual attrition has yet to be looked at closely. However, some studies of non-pathological language loss, in particular, with regard to lexicalized concepts allow us to hypothesize that possible linguistic manifestations of conceptual attrition may include difficulties in lexical retrieval, inappropriate labeling, code-switching, semantic shift, and framing transfer (Jaspaert & Kroon, 1992; Olshtain & Barzilay, 1991; Waas, 1996). Non-verbal manifestations of conceptual attrition would entail categorization and inferencing behaviors distinct from those exhibited by monolingual speakers of the L1, difficulties in comprehension of particular L1-specific concepts, and lack of mental imagery for these concepts.

In my own studies, I found that some conceptualizations of emotions are in the process of attrition in the conceptual store of Russian-English bilinguals. For instance, the concept of *perezhivat'* ('to suffer things through') is one of the key concepts in Russian emotion discourse; consequently, it is frequently used by Russian monolinguals (Pavlenko, 2002a). In contrast, in bilinguals' narratives it is largely absent, appearing in passing only in one bilingual's narrative. This suggests that new verbalizations of emotions internalized in the process of L2 socialization may result in at least partial attrition of concepts that no longer fit within the restructured network. These concepts may still be understood, at least partially, in spontaneous communication but they no longer appear to be actively used.

Conclusions

Clearly, it is not surprising that we find evidence of conceptual development and change in L2 users, particularly in immigrant communities. Our first language is acquired by engaging in natural meaningful communication through which conceptual knowledge is acquired, stored, activated and expanded upon. Likewise, language learners who acquire and use their second language in a country where it is spoken are engaged in a variety of meaningful interactions and social practices through which they become acculturated. If the interactions are to be successful, a certain amount of 'shared meaning' must exist, which can be ensured only by invoking the appropriate concepts since "the person can only be a meaningful entity, both to himself or herself

and to others, by being 'read' in terms of the discourses available in that society" (Burr, 1995, p. 142). Thus, as a result of linguistic assimilation and acculturation, the learners-participants in the second culture may develop conceptual representations similar to those of the members of the target culture, often without being consciously aware of this change (Pavlenko, 1999).

The proposed model of conceptual change in bilingual memory allows us to capture and examine the process of conceptual change through its linguistic and non-linguistic manifestations. However, the few studies existing to date mainly provide indirect evidence of conceptual change, as it is manifested in L2 influence on L1 performance and related phenomena. Future studies will need to provide direct evidence whereby the types of concepts in question will be examined through a series of carefully coordinated verbal and non-verbal tasks to ensure that the relevant linguistic manifestations are not overinterpreted. Furthermore, examinations of linguistic performance will need to include both elicited verbal tasks (such as labeling, inferencing, elicited narratives, or role play) and analysis of contextualized language use, ranging from tape-recorded conversations to patterns of language use in a variety of texts. Similarly, examinations of non-linguistic performance will have to entail a variety of tasks, from object categorization, to non-verbal role play, to memory tasks. The role of comprehension will also need to be carefully considered in these studies, as it is possible that some concepts may be at least partially understood by certain bilinguals but not actively used in their everyday lives and activities (Pavlenko, 1999). Most importantly, to fully capture the process of change it is extremely important to conduct longitudinal case studies of individuals in the process of second language acquisition – rather than to continue relying on cross-sectional studies. Only such studies will allow us to prove convincingly that individuals do indeed shift their patterns of inferencing, categorization, or recall in accordance with the L2-based representations, and to document this change in progress. Finally, we cannot and should not lose sight of individual variation in the study of – sometimes overgeneralized – cross-linguistic and cross-cultural differences. My own work with Russian-English bilinguals demonstrates that even within a group that is quite homogeneous with regard to socioeconomic characteristics, age of arrival, and length of exposure, different bilinguals exhibit different patterns of conceptual change. When these patterns of conceptual change are documented and examined across a variety of individuals, languages, cultures, and contexts, our field will finally be able to present fascinating evidence of languages not only shaping but also reshaping ways in which we think about reality.

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4

Second Language Acquisition and Working Memory

Kirsten M. Hummel

Individual bilingualism and the degree to which it interacts with memory is an intellectually intriguing phenomenon. One researcher who has devoted considerable intellect to elucidating issues on bilingual lexical representation as well as other questions related to the interaction of bilingualism and memory is of course Michel Paradis. Paradis' various publications (e.g., 1980; 1985; 1987; 1997a; 1997b) on aspects of what has been referred to as 'bilingual memory' have been invaluable contributions to clarifying issues and providing cogent analyses of existing data. Paradis' proposals of models and clarification of concepts in this literature, as well as his contributions to issues in the neurolinguistics of bilingualism, have contributed to a much better overall understanding of cognitive aspects of bilingualism. The following research examines one such issue related to bilingual cognition: the role of working memory in second language acquisition.

The degree to which individuals differ in their ability to master a second language has long been a subject of considerable interest. The literature on individual differences in second language acquisition has examined a variety of potential sources of skill attainment differences. These include the age factor, personality characteristics, and psychological and socio-psychological factors such as aptitude, motivation, attitude, cognitive or learning style, among others. Among the psychological factors that have been singled out as potential important contributors to second language success, language learning aptitude has been cited as playing a particularly important role (e.g., Gardner & MacIntyre, 1992; Skehan, 1989).

One important aptitude component that has been identified is mem-

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