The psychology of bilingual language acquisition: Its importance and implications for the Singaporean society

Hong Ee-Li and Rita E. Silver

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CHAPTER 8

The Psychology of Bilingual Language Acquisition

*Its Importance and Implications for the Singaporean Society*

HONG Ee-Li Rita E. SILVER

**INTRODUCTION**

Bilingualism is especially important in a cosmopolitan society like Singapore, where communication between people of different races and nationalities is essential. Studies in bilingualism come from three main disciplines, namely, psychology (which includes psycholinguistics and cognitive neuropsychology), applied linguistics (which includes second language acquisition and sociolinguistics) and education.

Researchers in the area of psychology have been interested in brain functioning and cognitive processing in bilinguals. They question how information is stored during the processes of learning in the bilingual mind, and how bilinguals might differ from monolinguals in their cognitive processes. On the other hand, those who are interested in bilingualism from a linguistic perspective question the fundamental nature of language, the way that languages are constrained in the mind and in society, as well as the way individuals and groups develop and use languages. Those in
education are most concerned with language teaching and learning in classroom settings, including concerns about teaching methods, individual differences in learning, the development of academic language, and assessment.

Researchers in both psychology and linguistics influence, and are influenced by, research on social and educational aspects of language. Issues of language contact, standardization, and the influence of interaction on language development are areas of interest to those who look at the social dimensions of psychology and linguistics. Knowledge of these issues is crucial to those who are interested in bilingualism and education. Thus all of these disciplines and areas of research are relevant to those who study educational psychology and educational linguistics.

Despite the overlapping relevance of these issues, most articles on bilingualism consider only one viewpoint (psychological, linguistic, social, or educational). This is particularly true in experimental research because of the constraints of the experimental paradigm. Overview articles also tend to address bilingualism from only one of the perspectives given above because of the difficulty in reconciling the different interests, methodologies, and terminology of the various disciplines. However, those who are interested in psychology and linguistics have much to say to each other with reference to bilingualism, especially where education is concerned. Understanding the cognitive aspect of bilingualism is essential as it may not only reveal how language systems are organized in a bilingual speaker, but also the factors that influence the processing and acquisition of the languages. Therefore, the first section will discuss the structure of the language system from psycholinguistic and neuropsychological perspectives. This will be followed by a discussion of social and educational aspects of bilingualism.

**STRUCTURE OF LANGUAGE SYSTEMS**

It has been generally accepted that memory can be divided into echoic memory, short-term (or working) memory, and long-term memory (the latter can be further subdivided into episodic, semantic, procedural and declarative memory). In the same way, multiple languages in a brain can be divided into separate language systems and are considered to be both neurofunctionally and functionally independent. Evidence supporting this
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...view comes from the various unique patterns of recovery made by bilingual aphasic patients (e.g. Albert & Obler, 1978; Paradis, 1977; Paradis, 1983), as well as psycholinguistic studies using translation and masked priming tasks (e.g. Bonin, Fayol, & Peereman, 1998; Davis & Forster, 1994; Ferrand, Grainger, & Segui, 1994; Forster, Davis, Schoknecht, & Carter, 1987; Gollan, Forster, & Frost, 1997; Grainger & Frenck-Mestre, 1998). This does not, however, mean that the different language systems in the brain are neuroanatomically distinct. What it does imply is that each language system in the brain of a multilingual can be represented by systems that are able to function independently of the other language systems.

This is not a novel position to hold since it has already been widely accepted that the unilingual structure in the brain of a monolingual user consists of separate subsystems, namely, the phonological, orthographical, syntactical, contextual and lexical systems (see e.g. Forster, 1976; McClelland & Rumelhart, 1981; and Seidenberg & McClelland, 1989 for descriptions of the cognitive models of language processing). Modularity theory (Fodor, 1983) posits that even though these different subsystems work together in a single language system, they are independent of each other. Fodor has proposed that a language processor is modular in that it possesses a number of properties, which include: (1) it only processes inputs of a specific kind, and that its output is similarly limited (domain specific); (2) when given an appropriate input, the processes run automatically (operation is mandatory); and (3) its working products are unlikely to be accessible to the central system, and hence to consciousness. Unlike the language processor, episodic memory exhibits non-modular properties, and it is sensitive to the intention to learn and to other motivational or attentional variations. The separation of the language domain from the more general-purpose cognitive system is reflected in theories of lexical access which regard the lexicon as a database in which only non-random vocabulary features (e.g. spelling, pronunciation) are recorded. Furthermore, the lexicon is thought to be placed within an input module (Fodor, 1983; Forster, 1979; Seidenberg, 1985). There are two benefits of such a modular architecture: firstly, the perceptual devices can be kept tuned to the environment since they are protected from the central system; secondly, the modular construction can allow the input module (lexical system) to function efficiently since the amount of information needing to be processed is kept to a minimum.
Psycholinguistic Perspective

Psycholinguists have been investigating the structure of bilingual lexical system in a number of ways to establish a model of bilingual language processing. These include studies on how many lexicons a bilingual has (for reviews, see Paradis, 1977; Paradis, 1997), and how information is retrieved from the bilingual lexicon (for a review, see Smith, 1997). One of the main areas in psycholinguistic research on bilingual language representation concerns how orthographic inputs are mapped to meaning. A majority of the early research on this issue assumed that the lexical properties of words were represented within the conceptual memory system. However, current research reveals the inadequacy of this assumption because it failed to distinguish between lexical and conceptual representations (e.g. Fodor, 1983; Forster, 1976; Katz & Fodor, 1963; Kroll & de Groot, 1997). This distinction makes it possible to develop theories which assume that form and meaning correspond to two different systems, namely, independent lexical systems for each language and a shared conceptual system (e.g. Chen & Ng, 1989; Kroll & de Groot, 1997; Potter, So, Von Eckart, & Feldman, 1984).

Bilingual Lexical Structure

The level of lexical representations was traditionally thought to refer to the semantic description of individual words (i.e. lexical semantics). Recent research on the representation of words and concepts in bilinguals makes the assumption that lexical representations do not include meaning but only aspects of word form. It is assumed that meanings of words are grouped within the conceptual representation (the lemma level) is proposed to carry out specific lexical-semantic functions (Levelt, 1989; Levelt, 1992; Levelt, 1995; Roelofs, 1992).

One of the earliest bilingual models was proposed by Weinreich (1967). This model postulated three possible ways of classifying bilinguals: coordinate bilingualism, subcoordinate bilingualism, or compound bilingualism. These three types of bilinguals differ from each other in the way the concepts of a language are assumed to be learnt (see Fig. 8.1).

Types of bilinguals

In coordinate bilinguals, the concepts are learnt independently in different languages. In subcoordinate bilinguals, the concepts are learnt in different languages but are attached to each other (both in the first language and in the second language). In compound bilinguals, the concepts are learnt in the first language only at the same time.

Early bilingual base models

Currently, these models are extended to in bilinguals in terms of the access to its L1 (e.g. the model proposed by Levelt et al., 1992).

While the
Fig. 8.1 The three types of bilingualism: coordinate, compound and subcoordinate (Weinreich, 1967). The languages used in this illustration are English (bird) and French (oiseau).

Types of bilingualism

In coordinate bilingualism, the words of two languages are kept separate in different conceptual systems and each word (in each language) has its own specific meaning. In this case, the languages are independent of each other (both conceptually and lexically). In subcoordinate bilingualism, the first language (L1) takes the position of the dominant linguistic system, and the linguistic system of the second language (L2) is attached to that of the first language. This type of bilingual would interpret words of the weaker language via the words of the stronger language at the lexical level. In compound bilingualism, the words of both languages are attached to the same mental representation; that is, two different verbal labels are attached to a single concept. In this case, the languages are interdependent only at the conceptual level.

Early bilingual models such as the one proposed by Weinreich are the base models from which contemporary bilingual models are constructed. Currently, two models of bilingual lexical structure are commonly referred to in bilingual studies. These two models differ from one another primarily in terms of the way words of the L2 gain access to their corresponding concepts. The word association model proposes that a word in L2 gains access to its conceptual representation via its translation equivalent in the L1 (e.g. through lexical mediation). In contrast, the concept mediation model proposes that the words of L1 and L2 have direct access to their corresponding concepts (see Fig. 8.2).

While the concept mediation model appears to apply to proficient
bilinguals, it was found that less fluent bilinguals and second language learners translated words more rapidly than they could name pictures (e.g. Chen & Leung, 1989; Kroll & Curley, 1988). This suggests that performance for less fluent bilinguals is lexically mediated via L1. Of late, there is also substantial evidence from Stroop\(^2\) studies (e.g. Chen & Ho, 1986; Tzelgov, Henik, & Leiser, 1990), translation studies (e.g. Kroll & Stewart, 1994; Sanchez-Casas, Davis, & Garcia-Albea, 1992) and cross-language semantic priming studies (e.g. Chen & Ng, 1989; de Groot & Nas, 1991; Kirchner, Smith, Lockhart, King, & Jain, 1984; Schwanenflugel & Rey, 1986; Tzelgov & Eben-Ezra, 1992) that with increasing proficiency in L2, there is a developmental shift from lexical mediation to concept mediation.

This developmental shift is, however, not a simple replacement of one mode of processing by another. Evidence from translation studies examining the role of cognates in second language processing suggests that fluent bilinguals do retain some level of lexical mediation (e.g. de Groot, 1992; Kroll & Stewart, 1994; Sanchez-Casas et al., 1992). Cognate word-pairs are words from different languages that share a common linguistic ‘ancestor’. Cognate word-pairs overlap in form and share the same meanings, (e.g. rico in Spanish means rich in English) and thus L2 cognate words can make use of lexical mediation via L1 to access their meanings. Consequently, a model of bilingual processing needs to take into account the simultaneous existence of both lexical and conceptual mediation processes. Kroll and Stewart (1994) propose a revised hierarchical model that combines features of both the word association model and the concept mediation model (see Fig. 8.3).

Kroll and Stewart (1994) suggest that bilingual memory consists of both lexical and conceptual processing. In the revised hierarchical model, the stronger links between L1 and L2 are the lexical ones, with the conceptual links being weaker. The model accounts for the fact that new L2 words are first accessed via L1, and the links between L1 and L2 are stronger than the links between L1 and L2 (see Kroll & Stewart, 1994). The revised model suggests that there is a developmental shift from lexical mediation to concept mediation, with more proficient bilinguals relying more on conceptual mediation.

If features of both the word association model and the concept mediation model are present in bilingual processing, then the model should account for the fact that new L2 words are first accessed via L1, and the links between L1 and L2 are stronger than the links between L1 and L2 (see Kroll & Stewart, 1994). The revised model suggests that there is a developmental shift from lexical mediation to concept mediation, with more proficient bilinguals relying more on conceptual mediation.
Fig. 8.3 The revised hierarchical model (Kroll & Stewart, 1994).

Both lexical and conceptual links; the strength of each of these two links is dependent on both the bilingual’s proficiency in L2 and the relative dominance of L1 to L2. For example, the lexical link from L2 to L1 is stronger than that from L1 to L2 because second language learners learn new L2 words by associating them with their corresponding L1 words; and the link between form and concept is stronger for L1 than L2 because the links between lexical and conceptual memory are established for L1 first. As the bilingual becomes more proficient in L2, the number of direct links between L2 words and concepts is increased; consequently, the L2 link between form and concept also becomes stronger (Kroll & de Groot, 1997). Support for Kroll and Stewart’s model comes from findings of translation-priming and semantic-priming studies (e.g. Chen & Ng, 1989; de Groot & Nas, 1991; Fox, 1996; Gollan et al., 1997; Tzelgov & Eben-Ezra, 1992).

If features and concepts of words are processed at different levels, how are the features of a word connected to the concept of that word? The theory of lexical access that accentuates lemma level processing maintains that the lexicon is comprised of lemmas (i.e. meaning and syntactic representations) and lexemes (i.e. word forms). The exact nature of the lemma representation has not yet been ascertained, but the general assumption is for one that includes syntactic and semantic information (Kroll & de Groot, 1997). The language-specific lemma level is thought to function as the interconnection between the lexical and conceptual representations. This would allow the bilingual’s two languages to make use of a common pool of lexical and conceptual features when required (for example, in a situation when both languages are used), and at the same time allows functional autonomy when the processing of only one language is required (see Fig. 8.4). However, it was found that depending on the nature of the two languages involved, the lexical link between the
L1 and L2 lexicons may be an element of either the form-representational level or the lemma-representational level (Hong, 1998).

Although the precise make-up of the bilingual language system is not known, evidence obtained from psycholinguistics studies suggests that the lexical semantic representation of words may be accessed by the words of another language in a bilingual setting. Support for this notion has also been obtained from neuropsychological studies, which are discussed in the following.

**NEUROPSYCHOLOGICAL PERSPECTIVE**

Much of the research on neuropsychology of bilingualism is centred on the interpretation of the recovery patterns of aphasic patients and the variability of the damage and recovery. Not unlike that of the psycholinguistic perspective, evidence from neuropsychological studies has shown that there is a distinction between lexical memory and concepts. Moreover, over the past decade, cognitive neuropsychological research has focussed on the modularity of cognitive functions.

**Neurofunctional Modularity**

Neurofunctional modularity implies that the internal structure and processes of each module are independent of, and unaffected by, those of the other modules with which they interact. However, these modules can, and do, work together in complex human activities (Gardner, 1985). Modules can interact with one another in at least two ways. Firstly, the output of one module may serve as the input of another module; secondly, the two modules may process the same stimulus, or different aspects of the same stimulus, or different elements of the same utterance. The outcome of such interactions is the integration of the meaning of the utterance. A specific neural network may mediate these interactions (i.e. the language network).

**Lexical Memory**

It is possible that even words are part of the same symbolic representation and are processed in the same way. As for the lexical memory and the conceptual memory, they interact with each other. Since every concept is linked to the meaning of the lexical form of the word (e.g., *large brother*, *large sister*), the meaning of the word is an integral part of the concept. Thus, both the lexical and the semantic representation of words are part of the memory network (Weltens, 1980). The evidence from neuropsychological studies suggests that...
the same stimulus, simultaneously to produce an output based on the outcome of the two processes (Paradis, 1997). Even though modules interact with one another, they still remain autonomous. They are domain-specific neuropsychological mechanisms that bring about the functional integration of complex tasks, such as the comprehension and production of utterances. Neurofunctional modules can be selectively impaired or they can operate in isolation. Thus, the various languages of a multilingual speaker may be considered as modular systems within a larger module (i.e. the language system) (Paradis, 1987).

**Lexical Memory and Concept**

It is possible to distinguish between the lexical meanings of words, which are part of the speaker’s linguistic competence, and the conceptual representations of these words. The conceptual system remains neurofunctionally independent and isolated from the language systems. As for the lexical items, there are semantic constraints, for example, the meaning of the sentence *my big brother* is different from the sentence *my large brother*, even though *big* and *large* can be used interchangeably in describing things such as balls or trees.

Since every language organizes mental representations in line with their own lexical semantic constraints, particular lexical items will activate certain mental representations (or concepts), while their translation equivalents will activate different concepts. Whether there are any shared features (or how many there are) will depend on how much of an overlap there is between the meanings of two lexical items. The extent of overlap for each item and its translation equivalent is also variable.

To date, the consensus seems to be for models that distinguish between the semantic and the conceptual systems (de Bot, Cox, Ralston, Schaufeli, & Weltens, 1995; Green, 1993; Levelt, 1989). The argument is that once concepts have been acquired, they are stored independent of language and do not need to be accessed through the linguistic system. Results obtained from aphasic patients show that these patients are still able to obtain access to the non-linguistic conceptual system (Lecours & Joanette, 1980). The evidence appears to support independence of lexical semantic representations and non-linguistic conceptual representations. This also suggests that lexical semantic constraints, which are part of a specific
language system, exist independently of non-linguistic conceptual representation. A bilingual speaker, therefore, seems to possess three isolable but interconnected systems, namely, the two language systems and a non-linguistic conceptual system (Grosjean, 1982; Paradis, 1985; Paradis, 1997). The readers can refer to Chapter 9 for further discussion on the neuropsychological perspective.

The systems within the mind of the individual bilingual are not the only important systems to consider. In addition, the family structure (including language use and language attitudes) and the larger social system must be taken into account. They provide the environment in which languages are learned – first, second, or bilingual. This environment can influence which languages are learnt, when they are learnt, and the extent to which they are learnt. Therefore, in the next section, environmental factors influencing second language acquisition (SLA) and bilingual development will be reviewed.

SECOND LANGUAGE PERSPECTIVE

Environmental factors can influence both first and second language acquisition. Although there is still much debate about whether first and second languages are acquired in the same way, especially for subsequent second language acquisition (as opposed to simultaneous bilingualism) and for adult second language acquisition (as compared with child second language acquisition), there are some similarities that cannot be ignored. Bilingualism can result from early, continued exposure to two languages at home in much the same way that monolingualism results from early, regular, continued exposure to one language in the home environment.

Input and Interaction in First and Second Language Acquisition

Studies of monolingual (first) language acquisition have shown that the input provided by a child's caretaker as well as the interaction between the child and the caretaker are essential for linguistic development. Language between a caretaker and a child, especially in infancy, has special features which distinguish it from the speech used between two adults. This speech has variously been called “motherese”, “caretaker talk”, or “child directed speech” (CDS). In this section, CDS will be used to refer to this type of speech.

The literature is useful for understanding notes that CDS include exaggerated sounds. Vowel sounds, which might be exaggerated when addressed to children, are most exaggerated. Snow contends that the child's development.

It can be assumed that CDS are related to frequent interaction, for example, not only do they use vocabulary and sounds that are focussed on the child (Snow, 1973; Farrar, 1986). The child seems to be learned in this way, reformulation: language but not necessarily correct form) which are focussed on the child's utterances and related to frequency. For example, it can be a grammatically correct form with an appropriate vocabulary (Baker & MacWhinney, 1988).

Another important fact is that the interaction is a significant feature, with an appropriate vocabulary and grammar which is continuing to develop.

In terms of...
The literature on CDS is quite large. A summary by Snow (1995) is useful for understanding the crucial points of that body of research. She notes that CDS when compared with speech between adults or between adults and older children is "...syntactically simpler, more limited in vocabulary and in propositional complexity, more correct, and more fluent" (p. 180). A noticeable feature of CDS is that intonation and pitch are exaggerated. This might serve to draw the infant's attention to speech sounds. Vowels are often enhanced so that they are very clear, and syllables, which might be reduced in conversation among adults, are not reduced when addressed to babies. These adjustments seem to occur at times when they are most beneficial to the development of child language; therefore, Snow contends that they constitute a type of input which is fine-tuned to the child's developmental needs.

It can be argued that some aspects of first language development are related to frequency and context. With reference to vocabulary acquisition, for example, nouns that are used frequently tend to be learnt first. Nouns that are used in situations of joint attention (when the caretaker and child are focussed on the same object) are also learnt rapidly (Tomasello & Farrar, 1986). Verbs which are used in the context of impending action seem to be learnt more readily than verbs used in the context of ongoing action (Tomasello & Kruger, 1992, cited in Snow, 1995).

The development of syntax may be closely related to interactional features. For example, recasts may play an important role in L1 acquisition (Baker & Nelson, 1984; Farrar, 1990; Farrar, 1992). Recasts are reformulations of a child's utterance, which maintain the child's original meaning but rephrase that meaning into a syntactically correct form. In this way, recasts can provide linguistic input to the child (modelling the correct form) as well as a type of correction (implicitly showing that the child's utterance was incomplete) which will help to build the child's knowledge of syntax.

Another interactional feature that seems to be related to language acquisition is topic continuation. In the case of topic continuation, a caretaker responds to a child's meanings by continuing the conversation with an appropriate response, even if the child's utterance was not grammatically correct. This allows the child to hear a correct model while continuing to pursue a topic of interest.

In terms of input and interaction patterns with children, the impact
of cultural norms on speech patterns must also be noted. Although the type of interactional adjustments described above are found in many different cultures and languages, all cultures do not have the same norms with reference to speech styles. There are areas in which cultural norms seem to take precedence. For example, although high pitch is almost universally a characteristic of speech to young children, in the Qu'iche Mayan culture high pitch is used only with higher status conversational partners. Since children are usually considered to be of lower status, high pitch is not usually a feature of conversation with children in this culture. As Snow (1995) puts it “cultural prescription... wins out” in these cases (p.185).

In second (as in first) language acquisition, learners are often exposed to speech which is adjusted to make it more comprehensible, to models of correct forms and/or provide implicit correction, and to adjustments which make topics more accessible to learners (Long, 1981). Like speech to infants, speech to second language learners (of any age) might consist of features such as exaggerated pitch and intonation, fewer reductions, (e.g. “Do you want to go?” instead of “Djawanna go?”) and a slower pace. It can also include recasts and topic continuations. In addition, native speakers may make other types of conversational adjustments in order to aid language learners and other non-native speakers. These adjustments include segmenting (using pauses and stress to make important words stand out more clearly), rephrasing and repetitions (Larsen-Freeman & Long, 1991). In the example below the native speaker (NS) of English repeats, rephrases, and allows the second language learner (NNS) to continue with the topic that she wants to pursue.

NS: So whenever you're ready, you can ask me about the story.
NNS: He's my?
NS: He's a man?
NNS: I mean my.
NS: My? I don't know...
NNS: (X) I mean (pause) the person who cuts the (X) in a kind of this (makes gesture)
(Silver, 2000)

Taken all together, these features of speech directed to second language learners are thought to aid SLA in the same ways that CDS is adjusted in order to assist...
order to assist children in first language acquisition and, in the same ways, may facilitate bilingual acquisition.

**Bilingual Acquisition**

Research has suggested that the types of interactions which are characteristic of caretaker speech may be as helpful for bilingual development as they are for L1 development. However, it is not wise to assume a parallel scenario for bilinguals and monolinguals. Social-situational factors also come into play including the child’s age, the parent’s proficiency in the language, and who else is present in the room. As well, there are questions about whether bilingual acquisition from birth (or early infancy) has a different route than bilingual acquisition at later stages of life. From the psycholinguistic perspective, questions about whether acquisition from birth or infancy (simultaneous bilingual acquisition) and acquisition after a first language has been learnt (subsequent bilingual acquisition) have to do with the controversy over whether or not there is a cognitive separation of languages and, if so, at what level(s).

Volterra and Taeschner (1978) proposed that bilinguals move through three stages of development: the first stage using a single system lexicon, the second stage including the application of the same syntactic rules to both languages, and the third stage showing separation of the single system. Their initial proposal has been strongly criticized both on methodological and theoretical grounds (see de Houwer, 1995 for a summary). As discussed in the first section of this paper, other researchers have proposed hierarchical systems, which include separation at different levels for lexical and concept acquisition. Separate lines of development have also been proposed for morphosyntax (again, see de Houwer for an overview). Unfortunately, the psychological literature on bilingualism is often not clear about when and under what conditions subjects acquired the two languages. Researchers sometimes consider simultaneous bilingualism to mean learning two languages from birth onwards or from a later stage of infancy (e.g. McLaughlin, 1978, who has suggested that up to age three would be acceptable, though he admits that this cut-off is an arbitrary one, as cited in Romaine, 1989). Romaine (1996) accepts both of these time periods for simultaneous bilingual acquisition but considers subsequent bilingual acquisition to be part of SLA (while admitting that this is also an arbitrary distinction). Therefore, it can be difficult to make connections between
the findings of this research and questions about similarities and differences in simultaneous and subsequent bilingualism.

Second language researchers and sociolinguists are interested in the issue of separation in terms of language use; they investigate the implications and meaning of mixing languages within contexts and across contexts. Bilinguals are known to shift from one language to another depending on the social context. It is now well accepted that sociolinguistic norms influence the choice of language among adults. Research has also shown that children are often sensitive to conversational situations (i.e. when and where) and interlocutors (i.e. with whom) in terms of language choice. (See de Houwer, 1995, pp. 244-248 for a discussion.) Therefore, shifting between different languages in different domains does not necessarily indicate less than fluent bilingualism. In fact, it may indicate a heightened language awareness and sensitivity to linguistic norms.

Teachers and parents are also interested in the implications of language mixing out of concern for the child’s ultimate language learning. One of the long-standing principles of raising bilingual children has been the “one person/one language” principle (Ronjat, 1913) which proposes that each parent uses a different language with the child from birth. Some have suggested that consistent use of only one language by each parent coupled with negative reactions to mixing would prevent code switching between the two languages. (See de Houwer, 1995, pp. 227–229 for a discussion.) However, the evidence from sociolinguists (discussed above) shows that code switching is natural and governed by knowledge about the situation and the conversational partners. It is also possible that mixing is a development stage that children who simultaneously acquire two languages go through. Whether or not consistent language use by the parents could or should prevent language mixing, use of the “one person/one language” principle can certainly result in a substantial quantity of situationally appropriate input.

In summary, interactional adjustments which are found in speech with monolingual, first language acquirers are also found in conversations with simultaneous, bilingual acquirers and with second language learners of all ages. These factors are thought to be beneficial for L1, L2, or bilingual language acquisition. However, situation factors also come into play. Because the “one person/one language” principle encourages substantial input in the child’s life, this modality may be optimal. However, this is not always the case.

Roma language acquisition is not a straightforward issue. The ways in which the child’s language learning is shaped is likely to be shaped by the social environment. In summary, interactional adjustments which are found in speech with monolingual, first language acquirers are also found in conversations with simultaneous, bilingual acquirers and with second language learners of all ages. These factors are thought to be beneficial for L1, L2, or bilingual language acquisition. However, situation factors also come into play. Because the “one person/one language” principle encourages substantial input in the child’s life, this modality may be optimal. However, this is not always the case.

Table 8.1

<table>
<thead>
<tr>
<th>Home Language</th>
<th>Language A</th>
<th>Language B</th>
</tr>
</thead>
<tbody>
<tr>
<td>“One Person/One Language” (both parents)</td>
<td>Language A (both parents)</td>
<td>Language B (both parents)</td>
</tr>
</tbody>
</table>
input in both languages, and because both parents seem to adjust to the child’s linguistic needs when taking on the role of “language caretaker”, this model is often suggested for simultaneous bilingual development. However, other models are possible.

Romaine (1989, 1999) has identified six models of childhood bilingual acquisition. She takes into account not only the language(s) that the parents speak to the child, but also the language of the larger community and whether or not the parents are native speakers in the language(s) used at home. Three of those models will be discussed here to highlight some of the ways in which the societal context might play a role in bilingualism (see Table 8.1).

Romaine’s first model includes the “one person/one language” principle described above. In this case, each parent speaks his/her native language to the child (language A and language B). However, in the wider community, only one of the languages is used (language A). In this case, it is likely that the child will understand both languages equally well but will only speak language A fluently. Thus, the possible impact of the larger social environment must be taken into account.

In situations where both parents speak a language (A) which is not the language of the larger community (language B), the parents may speak language A at home exclusively. This may benefit the child in terms of learning language A but have repercussions when the child must attend

Table 8.1 Models of bilingual development (adapted from Romaine, 1989, 1999)

<table>
<thead>
<tr>
<th>Home Language</th>
<th>Community/ School Language</th>
<th>Possible Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Languages A &amp; B</td>
<td>Language A</td>
<td>Equal comprehension of both languages is likely with spoken fluency in A.</td>
</tr>
<tr>
<td>“One Person-One Language Principle”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language A (both parents)</td>
<td>Language B</td>
<td>With some educational support of Language A, the child may develop equivalent skills in both.</td>
</tr>
<tr>
<td>Language A (both parents)</td>
<td>Language B</td>
<td>Without some educational support of Language A, the child may not become literate in that language.</td>
</tr>
</tbody>
</table>
school in language B, depending on the type of learning environment and whether or not the child's home language is supported by the educational system.

In the case where the child's home language is not the dominant language of the school and community but the child's home language is supported at school, or through private instruction, it is possible that the child will develop skills in both languages, leading to bilingualism. Education of some type is obviously necessary for the development of literacy skills: a more equivalent type of bilingualism is most likely to result if the child becomes literate in both languages (Verhoeven & Aarts, 1998).

The question of whether or not the child will have difficulty developing literacy skills when the school language differs from the home language and the child has no literacy training in his/her home language is controversial. While many researchers have advocated early literacy instruction in the home language, Hudelson (1994) notes that there are many similarities in literacy learning whether in first or second language. Therefore, if teachers create a literacy friendly atmosphere, children who are learning in a second language can develop literacy skills. However, it is unlikely that this situation would lead to balanced bilingualism since the child's academic knowledge and literacy skills would be based in the L2. What is more likely to result is a sort of diglossia (Ferguson, 1959), where the choice of one language or the other depends on the situation. Wagner (1998) points out that in some cases developing literacy in the second language may be the only option since some languages do not have a history of print and/or quality instructional materials in the first language. Important variables to be considered in this debate are those of power relationships and identity (Cummins, 1999); respect for the home language can be very important for the child's attitudes towards literacy and towards schooling in general.

Bilingual Development and Bilingual Education

It is clear that the development of bilingualism extends beyond infancy and beyond the home environment. Bilingual development "...requires the continued use of both languages in communicative naturalistic settings" (Kessler, 1984, p. 35). Education can play a developmental role through the teaching and use of language that is appropriate for new (especially academic) helping to notes that language of languages of languages.

For children for the development of language is or subsequently develop equivalent style some mode depending on the language. Typically, students in two languages, these programs based programs speaking children are considered as both language better in English. students in a speaking atmosphere of the school there was a typically, the performance knowledge.

The language in school languages the child's first Canadian immersion was a prestige language, French development and bolster Immerso
The Psychology of Bilingual Language Acquisition

In academic contexts, in developing literacy skills in two languages, and in helping to maintain linguistic knowledge in both languages. Kessler also notes that it is quite common for a bilingual child to go through periods of language attrition or language loss. Therefore, education in both languages can play a maintenance role for bilinguals.

For children from monolingual homes, bilingual schooling is an option for the development of an L2 while maintaining the L1. Because the first language is already established in these children, this is considered to be subsequent bilingualism, as discussed above. It is notoriously difficult to develop equal and fluent bilingualism based only on school learning, but some models of bilingual education have seemed to be successful, depending on the level of linguistic ability the school hopes to achieve. Typically, successful programmes offer instruction in language and content in two languages; however, there may be different levels of “success” in these programmes. For example, Hakuta (1986) reported on a school-based programme in Florida which taught Cuban-Spanish and English-speaking children in both languages in the schools. The programme was considered to be successful because students developed literacy skills in both languages, although the English-speaking children continued to read better in English than they did in Spanish.

Swain (1985) reported that students in a French immersion programme in Canada (native English-speaking at home; French immersion at school; little use of French outside of the school) did well on several measures of French proficiency. However, there was a noticeable difference in their proficiency on different measures: typically, they did well on oral and written production tasks, but their performance was noticeably non-native with reference to grammatical knowledge.

The larger social context is also a factor in becoming bilingual: Is the school language a minority or majority language in the larger society? Is the child’s home language valued or devalued by society? In the case of the Canadian immersion programme noted above, the children were learning a prestige language (French) as their second language and their first language was supported by the larger community. While the use of their first language, English, in the larger community was not beneficial to their French development, community support most likely helped to maintain and bolster their English language development.

Immersion bilingual programmes are often not successful when the
home language is different from the majority language and is devalued by the larger community. When children are immersed in a second language with little or no support for the first language, loss of the L1 is likely to result (Romaine, 1996). Therefore, these programmes are sometimes called "submersion" in contrast to immersion programmes, which foster both languages through extensive use in school. For further bilingual development or for subsequent bilingual development in school, immersion programmes which facilitate development in both languages, which foster literacy in both languages, and which show respect to the home language of the child, may be the best.

Another option for school-based language development is a second language class. In school programmes with second language classes, children are offered a second language as one of their content subjects at school. For example, an immigrant child in the US who speaks Cambodian at home might be placed in a school that teaches all classes in English. The child could also be placed in a second language class to study English in a format designed for non-native speakers. These classes are usually offered as a kind of remediation – the goal being to move the child into a full-day of English-only classes as quickly as possible – and do not constitute bilingual education in the sense of offering development in or use of two languages.

Different language learning outcomes can be expected from these different programmes due to both quantitative and qualitative differences (e.g. amount of instruction, content of classroom learning, interactional patterns used, status conferred on the two languages). No matter what type of programme is offered at the school – immersion which fosters two languages, "submersion classes" which push children to switch to the second language, or second language classes – there are a few pedagogical principles that teachers might find useful. McKeon (1994) suggests that language be used authentically and communicatively whenever possible. She reminds teachers that not all language learners are alike – there may be variation across and within groups. Finally, she recommends that teachers integrate language and content instruction whenever possible. This can help the children to develop academic and linguistic skills. However, "communicative" teaching also may not be sufficient, as Ellis (1994) warns, especially for advanced grammatical development. Language learners may need some sort of negative evidence to know that something is not permissible in the language they are attempting to learn, not the language of instruction (Ellis, 1994). So much variation in the language used makes hard any attempts to create a fixed environment, format, and feedback on the language that is used. In addition, connecting language development to the development of the child may be beneficial for the child.

BILINGUAL

In the Singapore of the last century, established, and in the future, the language of instruction in lessons in English, writing, listening, and Social Studies is considered to be English. Of the students who make up the population of Singapore. The language of academic lessons conducted in English is important for the description of the implications is beneficial for the child.

At home, children are exposed to languages (Tai and others). Attempting to not the primacy of the child's English.
permissible in the language, as well as positive input to learn what is possible in the language (White, 1987). Also, teachers must be careful to consider both language and content needs when integrating language and content instruction (Pica, 2000). Teaching the content in the L2 does not automatically confer linguistic ability in the L2.

So much variability exists in language learning that it is impossible to make hard and fast rules. However, support in and for the home environment, as well as the use of authentic language for communication and feedback mechanisms that draw learners attention to the areas of language that need further development, would seem to be essential. In addition, connections between language and content learning, along with the development of literacy in both languages, are most likely to be beneficial for the development of bilingualism.

**BILINGUALISM IN SINGAPORE**

In the Singaporean context, bilingualism as a societal goal is well established, and bilingual education is standard. English is the main language of instruction starting from the first year of school. In addition to lessons in English Language (including the development of reading, writing, listening and speaking skills), content areas such as Maths, Science and Social Studies are taught in English. The educational system is considered to be bilingual because “Mother Tongue” instruction is also given starting from the first year of primary school, with children pursuing classes in Mandarin, Malay or Tamil. These three languages, plus English, make up the four official languages (and also national languages) of Singapore. They are all used in the community, with English being the language of administration. Most conversations and businesses are conducted in either English or Mandarin, with English being especially important for higher education and the professions. A more complete description of the Singapore educational system and the linguistic implications is provided by James, 1994.

At home, children might be exposed to, and interact in, two or more languages (Tay, 1983). English is especially valued with some parents attempting to converse with their children in English even though it is not the primary language of the parents (Kwan-Terry, 1991). Some educators feel that this leads to the introduction of non-standard forms in the child’s English, although primary school teachers cite the lack of English
at home as the most common problem (teacher interviews, March, 2000). Recently, the government has started a Speak Good English Campaign to discourage the use of a local variety of English known as Singlish which they fear is spawned by the use of non-standard English at home and the multilingual, multiracial Singaporean society.

While Singlish is a fully grammatical language based on linguistic analysis and linguistic theories (Alsagoff & Ho, 1998), many Singaporeans consider it to be ungrammatical and deficit (as evidenced by write-ins to the local English paper, The Straits Times). Although the "standard" of Standard English is not clear (Pakir, 1994), it cannot be disputed that Singlish is a localized variety. Many fear that its perpetuation will make it difficult for Singaporeans to be understood in international contexts. Therefore, the burden of teaching some form of standard English falls to the schools.

However, for full bilingualism, the mother tongue must also be developed, including academic and literacy skills. As mentioned above, a great deal of the emphasis in the educational system is placed on speaking and writing good English. In addition, many parents try to provide more opportunities for their children to speak English by conversing in English with their children at home or by paying for extra classes in English outside of school hours. This in turn reduces opportunities for the children to use and develop their mother tongue. Again, the burden falls to the schools to teach a standard form of the three "mother tongue" languages and to develop literacy skills in them.

To ensure that Singaporean children are effectively bilingual, there must be appropriate support in school and at home for both L1 and L2, as described above. Parents can also make a strong contribution to each child's linguistic development (in one or both languages) by providing a language-rich environment at home. Book reading is important for the development of language and literacy skills; parents can and should read to their children as much as possible. Even parents who are not literate can contribute to their children's linguistic development by using audiotaped books while looking at the text together.

Parents might wish to emphasize reading in the mother tongue to contribute to literacy in that language. They may also want to read in the English language to provide more English support. The decision of how much time and in what situations to provide English or mother tongue support will depend on the individual needs of the child.

A final recommendation is that both language use at home as well as at school should be left up to the child (Houwer, 1997). While parents can provide opportunities to use both languages, it is important to respect the child's autonomy in language choice. Teachers can encourage the use of both languages in the classroom, but should avoid rebuking the child for using Singlish when they have made a conscious effort to use standard English.

Moreover, it is important for parents to consider the possibility of providing direct support to their children in both languages. The mediation of cognitive processes in the individual development of language proficiency is not only measurable but can also be directly influenced. Research on second language learning has shown that the mediation of language processing in the classroom can improve the child's understanding and use of both languages. Teachers can provide direct support to their students by using a variety of materials and strategies that cater to the individual needs of each child.

CONCLUSION

Research on second language learning reveals how language processing in the individual may influence the development of language proficiency. The mediation of cognitive processes in the classroom can improve the child's understanding and use of both languages. Therefore, teachers can provide direct support to their students by using a variety of materials and strategies that cater to the individual needs of each child.

NOTES

1 A notable example of such processing in bilingual children is the research of Houwer, 1997.
support will depend on the circumstances of each family and, referring back to Romaine's models of bilingualism, to the societal circumstances. A final recommendation for parents is that they use the same language with all their children, that they do not make artificial changes in their language use (for example switching from the mother tongue to English when the child is young in the attempt to instil English), and that they avoid rebuking or punishing children for using a particular language (de Houwer, 1999).

A final thought for teachers concerns expectations for the recall of learned concepts and spontaneous language use: If concepts are shared, teachers can expect that concepts will be available to bilingual learners in both languages. However, accessing those concepts may take time (i.e. processing time), especially when language proficiency is low. Building up the necessary language skills in both languages will take time that can only be measured in years of schooling.

CONCLUSION

Research on societal and interactional patterns is of interest because it reveals how languages are used and the ways in which these patterns of use might influence language learning (both first and second). This information might influence classroom pedagogy and language policy, but it does not provide direct information as to how learning takes place in the mind of the individual. Research in psychology, on the other hand, reveals the ways in which bilingual individuals store and retrieve information. Of particular interest is the implication that bilinguals may store and use concepts and lexicons hierarchically, and that there may be differences in the mediation processes for first and second language lexicons. Finally, the possibility that these mediation processes are influenced by language proficiency is of interest to second language acquisition researchers. This information does not directly inform pedagogy at this time, but further research may have implications for ways in which teachers and school programmes can effectively influence language learning processes.

NOTES

1 A notable exception is an edited collection by E. Bialystok (1991), Language processing in bilingual children, which includes articles on psycholinguistics, second language acquisition, and cognition.
The Stroop interference effect was first discovered by Stroop (1935) when he found that it would take longer to identify the colour of a printed name of another colour (e.g. in identifying the colour of the word RED printed in green as "green"). A typical Stroop interference task consists of: (1) an incongruent condition, where the stimulus word (i.e. the colour word) is different from the name of the colour it is printed in, (2) a congruent condition, where the colour word is the name of the colour it is printed in, and (3) a control condition, where the stimulus is a string of symbols (e.g. XXXXX).

The extent to which innate characteristics or environmental factors such as frequency and context play a part in language learning is not taken up in this chapter. For a summary of the issues of parameters and Universal Grammar in first language acquisition, see Meisel (1995); for discussions of parameters and Universal Grammar in second language acquisition, see Flynn (1996), Schachter (1996), and White (1996).

See Hornberger, 1991, for a discussion of the various types of bilingual education and how they are labelled.

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The study of linguistic competence and its development is essential. In times when language is a complex system, understanding the relationships between being a native speaker and being a second language learner is crucial. Linguistic universals, as defined by Weinreich (1967), provide a framework for understanding these relationships.

In times of linguistic contact, as explored by White (1987) and White (1996), understanding the nuances in language structure and function is essential. In understanding the effects of language contact, we see how language learning is not just about acquiring grammar but also about understanding the cultural and social contexts in which language is used.

In times of multilingual education, as described by Wagner (1998), we see the importance of putting second language first. Literacy development in a multilingual context requires a nuanced understanding of language and literacy learning.

In summary, the study of second language acquisition is not just about language learning but also about cultural understanding and the development of second language competence. As White (1987) and White (1996) have shown, linguistic universals provide a useful framework for understanding these complex relationships.