Children with Two Languages

11/24/ 2007

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21.1 Introduction

The study of bi- (or multi-) lingual children has the potential to inform—or challenge—our ideas about the fundamental process of language learning, its timing and limits, and about the role of the environment in conjunction with factors internal to the child or the languages themselves.

Until recently, childhood bilingualism was considered a special case of language acquisition, rather than the majority phenomenon it is (Crystal, 2004). According to a topic search by Bialystok (2007), the number of articles on bilingualism in the corpus selected more than tripled between 1997 and 2005, from an average of 100 articles in 1997 to over 350 in 2005. One- and two-case studies are popular and instructive, but we are also witnessing the study of groups of children and the establishment of large government-funded projects like the Collaborative Research Center for Multilingualism in Hamburg and the recently instituted Centre for Research on Bilingualism in Theory and Practice at the University of Wales, Bangor. In such centers, much of the programmatic research is devoted to issues in bilingual acquisition.

Crystal (2004) proposes that the innate mechanisms that help children acquire their first language also help them acquire second or subsequent languages in early

childhood. In his view, the Language Acquisition Device, or "LAD," (Chomsky, 1965) is really a "MAD," or Multilingual Acquisition Device, so innate factors are as crucial for bilingual language acquisition as for monolingual acquisition. On the other hand, bilingual learning children's more obvious dependence on relatively specific amounts of input from the environment has theoretical implications for the nature of the LAD (or MAD) and also more practically, for the kind of support parents and other interlocutors provide for language learners, what Bruner (1983) called the LASS, the Language Acquisition Support System.

In this chapter I first give a broad descriptive overview of childhood bilingualism and its many manifestations, especially behaviors unique to bilinguals. Then I compare early versus late acquisition of the second language and bilingual versus monolingual acquisition. Finally, I point to practical research on bilingual children in education and communication disorders.

21.2 Terms for Talking about Bilinguals

The term "bilingual" takes on slightly different meanings depending on whether it is used to describe an individual, a community, or a behavior. A person is "bi-lingual" if he or she can use two languages in communication. Similarly, a community is bilingual if some functions of community life take place in one language and other functions in another. A language practice is bilingual if it mixes elements of two languages either receptively or expressively, or both.

21.2.1 Classifications of Bilinguals by Skills

The consensus is that individuals who use more than one language fall on a spectrum. At one end is the simultaneous interpreter at the U.N. who speaks both languages as well as a native and is fully literate in both. At the other end are newborns who hear two languages spoken to them, but who cannot speak or understand even one language, much less two. In between these poles are all degrees of proficiency and use. Preschoolers who are just being introduced to a new language at school that is different from the one they speak at home are often called bilingual because, like the newborn, they have bilingual input and will probably speak two languages at some point in the near future. They will be considered true, **active** bilinguals when they have productive use of two grammars and can produce and understand novel sentences in both the first and second language, even if skills in the languages are not **balanced**. Often a bilingual has only one language that is at the same level as a monolinguals' single language. Typically one language is **dominant** and the other is **non-dominant**, or weaker. Which language is dominant at any one point can change over time with new experience and new needs for one or the other language. Also, children younger than age 9 or 10 are vulnerable to loss, or attrition, of a language if they do not use it consistently.

21.2.2 Classification by Learning Context

Bilinguals differ according to how their two language communities relate to each other. If the learners' dominant language is the community (or **majority**) language, they would be called **"elite**" or "**elective**" bilinguals--for example, French speakers in France who decide to learn Chinese. To be bilingual is a choice since the primary language will already serve their basic needs in the community. The opposite is a "**heritage**" or "**folk**"

or "**immigrant**" bilingual, for example Chinese speakers who move to France and must learn French for their daily life and livelihood.

Another defining characteristic is the place where the languages are learned and used. A "home language" may serve for primarily conversational purposes, what Cummins (1979) calls "**Basic Interpersonal Communication Skills**" (or BICS). More formal, academic language, typically learned at school or in formal settings, he called "**Cognitive-Academic Language Proficiency**" (or CALP). CALP engages all four modalities of language use: understanding, speaking, reading, and writing, whereas BICS are more likely oral language only. Those who can read and write as well as understand and speak both languages are bilingual and **bi-literate**. Those who can only understand and possibly read but do not speak or write the second language are **passive bilinguals.**

21.2.3 Classification by Timing

One common classification of bilinguals is based on when the languages were learned relative to one another. Child bilinguals can begin both languages at birth **simultaneously** or learn one first and then after that one is established, learn the next one **sequentially (**or successively**)**. An infant bilingual is unambiguously a simultaneous learner, but a child bilingual could be either a simultaneous or sequential learner. The terms for this contrast are **Bilingual First Language Acquisition** (BFLA) and **early Second Language Acquisition** (early SLA). When one language is learned first and then another one learned as a **second** language**,** they are called **L1** and **L2**. Both infant and child bilinguals are considered early bilinguals as opposed to someone learning a second language late, or after a critical age (yet to be determined).

It is not obvious what the limits are of "early" in early SLA nor what the nature of second language learning is for the child learner. Early language learning is unlike other complex behaviors, such as figure skating or playing the piano, which seem like "talents" and are normally distributed throughout the population. Children learning an L2 within an early sensitive period have a more universal expectation of success, as for other human endowments like walking or binocular vision (Hyltenstam & Abrahamsson, 2000). Everyone with sufficient exposure and without a specific handicap—such as deafness—achieves native or near-native fluency. By contrast, late second language acquisition is more like a sport, or a talent.

21.2.3.1 The age factor. It is a matter of some debate whether second language learners have access to innate mechanisms (the LAD or Universal Grammar, "UG") specialized for language learning, or whether they must use more general learning principles which are less efficient for language tasks. Early accounts (e.g. Lenneberg, 1967) proposed that the cut-off between early second language learning (with UG) and late learning (with general learning principles) was puberty. However, studies of different language domains show no clear cut-off age but rather a gradual decline in ability for language tasks starting as early as age 7. Indeed, for some tasks, such as phonological discrimination in the laboratory, or processing the new language in the presence of noise, not every person who learned a second language before age 7 falls in the same range as monolingual learners (Caramazza *et al*. 1973; Hyltenstam & Abrahamsson, 2000). Still, in the real world, within four or five years of starting the second language, the "early sequential bilingual" is indistinguishable from the native

speaker. For many people in many parts of the world, the L2 becomes their primary language.

For syntax the age of 9 or 10 seems a promising candidate for the language divide between early and late language learning. Hahne (2001), using ERP measures, found strong differences in syntactic (but not semantic) processing between bilinguals whose age of acquisition of the second language was younger or older than 10. Also, before age 9, learners of a second language were more likely to adopt a preference for L2 syntactic structures than were older learners, whose preferences did not shift away from the L1 (Jamshidia & Marefat, 2006). For phonology, Caramazza *et al.'s* (1973) findings indicate that the divide comes earlier particularly in perception, whereas there is no age limit for learning vocabulary or the pragmatics of discourse in two languages, and the older learner is perhaps better than the younger learner in those domains.

In sum, "childhood bilingual" would be the general term for one who learned two languages natively before age 9, with the caution that the boundary between early and late is porous. Some rare individuals under 9 will not achieve native fluency (Ioup, 1989), and some individuals older than 9 will (DeKeyser & Larson-Hall, 2005). Even sequentially, the young child learns two languages in the implicit manner characteristic of first language acquisition. Given rich enough language interactions in two languages, children can learn them both without explicit, formal instruction.

21.2.3.2 Learning order. Also at stake in the difference between learning a language early or late is whether the second language is learned "from scratch," independently from the first language, or whether it is filtered through the first language structures. In a University of Miami study of lexical learning by 18 bilingual-learning

infants (Pearson & Fernandez, 1994), most children were observed to be learning new words in both languages and seemed to be learning both languages "from the ground up." One child, however, learned no words in her second language that she did not already know in her first language. So despite having begun both languages at birth, she seemed to be filtering the second language through the first, like a second language learner. Other reports also indicate that transitory accents have been noted in preschoolers (Fantini, 1985; Leopold, 1939) and what looks like grammatical transfer (Dopke, 1998), or other influence from one language to the other (Paradis & Genesee, 1996), all indicating some degree of second language learning.

21.2.3 Relationships between the Two Languages of a Bilingual

Individuals can be balanced in their oral skills, but have a dominant language for reading and writing (or vice versa). Whether they are balanced or not, they can have their skills, like vocabulary, "**distributed**" between the languages (Oller & Pearson, 2002). For example, a scientist may know technical vocabulary learned in the L2 in that language only and not in the L1. Knowledge of household or sports terms may be more accessible in L1, and relatively fewer terms equally accessible in both.

In general, it is easier to learn a majority language than a minority language. That is, it takes more exposure to a minority language for the same degree of acquisition (Pearson *et al.*, 1997; Vihman *et al.* 2006). When an elective/ elite bilingual learns a second (minority) language, we expect the second language to be ADDED to the first. To learn French, the majority-language English speaker does not have to forget English first. French is added to English, in **additive bilingualism** (Lambert, 1977). When an

immigrant learns a second language, especially a child under 10, it is often at the expense of the first language, resulting in **subtractive bilingualism,** unless efforts are made to help the child continue growing the first language as well as the second.

The extreme case of subtractive bilingualism has been called "**serial monolingualism**," where one language replaces the other, and the individual ends up not being bilingual at all. Serial monolingualism is observed in foreign adoptees who leave their country at an early age and subsequently lose all contact with their native language. For example, Pallier *et al*. (2003) showed that in word recognition tests and neuro-imaging data, French adults who had been adopted from Korea between ages 3 and 7 showed no greater response to Korean than to another unknown language. More usually, the first language skills persist. In a study of processing, Kohnert and colleagues (1999, 2002) documented the time course of the switch in language dominance among bilinguals who did not learn their L2 until the start of school. Among these children, their dominance shifted, and the L2 at different times (for different skills and subskills) became the stronger language. Still, both languages advanced during the time they examined (age 6 to adult), but the L1 at a slower rate than the L2. The researchers did not observe that the L1 actually regressed.

Another distinction between types of bilinguals derives from observations of how individuals use their languages, and how much interaction is envisioned between the two languages. Cummins' (1979) description of **independent** versus **interdependent** development echoes the earlier distinction from Weinreich (1953) between **coordinate** versus **compound** bilinguals. A coordinate bilingual was envisioned as having two independent systems that develop in parallel, but with minimal connection or overlap

between them. Wierzbicka (2005) characterizes it as having "two sets of mental furniture," a suite for each language. A "compound" bilingual, by contrast, would have only one set of mental furniture, with two sets of labels for the different pieces. The languages are pictured as "interdependent."

21.3 Bilingual Behaviors

Being bilingual also entails a certain amount of mental machinery involved, for example, in labeling elements as to which language they are part of and in coordinating the two languages. Psycholinguistic evidence indicates that both languages of a bilingual are always activated (Francis, 2005), so there are elements of both conscious and subconscious choice in which language gets processed and which language gets suppressed in any situation.

21.3.1 Monolingual versus Bilingual "Mode" of Speaking

Grosjean (1989) protests that a bilingual "is not two monolinguals in one person," but in fact, some bilinguals operate in what he calls a "monolingual mode" (Grosjean, 2001). That is, they switch between being a monolingual speaker of one language with one person (or in one situation) to being a monolingual speaker of the other language with another person. Other people do not feel their languages are so separate from each other and they use both languages together in a "bilingual mode," or "rich language stew" (Gupta, 2006) when the situation allows. Most bilingual people, regardless of whether they learned their languages together or separately, report that they can operate in either a monolingual or bilingual mode, depending on whom they are speaking with and what the situation requires.

21.3.2 Codeswitching (and Code-mixing)

A phenomenon unique to the bilingual mode is **code switching**, where two languages are used within the same utterance or turn. Bilinguals' seamless switching between languages (here called "codes") can happen either between sentences or within sentences at permissible points in the grammatical structure. The latter is often called **code-mixing**. Some bilinguals have negative attitudes about code-switching and resist the impulse to mix, but many others profess to prefer it. In many bilingual parts of the world, for example in India, Singapore, or south Florida, mixed language contexts are the standard, and people report it would feel unnatural to restrict conversations to one language (Gupta, 2006). There is also a growing bilingual literature from writers who flow lyrically back and forth between languages, writing for others with knowledge of both languages. (See de Courtivron, 2003; or the Nuyorican Poetry Cafe, 2007.)

Code-mixing used to be thought of as a failure of bilingual behavior. In fact, some of it is due to filling in words one does not know or cannot recall in one language, but code-mixing turns out to be a skilled behavior that people master only after they have considerable skill in both languages. The principal constraint involves having the utterance respect the grammar of both languages at once. This is readily accomplished by adding an invariant tag, or a quotation, which has no syntactic links with the previous material. For example, "He said he'd be late, n'est-ce pas?" ('[isn't that] right'). A second kind of switch happens within sentences but at clause boundaries, as in the example from Poplack (1980), "Sometimes I begin a sentence in English, y termino en espanol." ('and I finish [it] in Spanish'). A word or a phrase from one language can also be embedded within a constituent in the grammar of the other language where it takes the

word order and morpho-syntax of what is called the **matrix language** frame (Myers-Scoton, 2001). Generally, only a small percentage of switches involve insertions of one word into the grammar of the other language. Allen (2007) gives examples from the highly inflected Inuktitut language, where the inserted English material ("mushy") follows the word order of the matrix sentence and takes its word endings: *mushy-u-nngi-tu-rulu-alu-runa.* ('[mushy]-be-NEG-one.which-little-EMPH-this.one 'This little one isn't mushy.') Proper names and words with similar pronunciation are often "**triggers**," as in this example from Clyne (2003): "Holland was too *smal voor ons*. *Het was te benauwd*… ('too narrow for us. It was too oppressive'). The shared pronunciation of "*smal*/small" appears to condition the switch from one language to the other.

Clyne (1980) noted that there is a micro-pause at the juncture where a switch takes place, and indeed in psycholinguistic experiments that force switching, the switch has been shown to have a measurable time cost. It takes longer to switch from a non-dominant language to the dominant language than vice versa (on average 143 milliseconds versus 85 ms). This may be counter-intuitive, but Meuter (2005) argues that this asymmetry indicates the speaker is working harder (subconsciously) to suppress a dominant language than a non-dominant language, and thus it takes longer to release the suppression.

21.3.4 Codeswitching in Children

Children's mixed utterances have been examined to see whether there is a period of development during which their code-mixing is ungrammatical, or non-adultlike. While there are clearly some errors—just as adult speech contains performance errors that do not reflect the speaker's competence—only a small percentage of children's

codeswitches do not fit into the categories for adults. In Allen's (2007) Inuktitut data, for example, all but 5% of the codeswitching, even at the earliest ages, fit the structure of both languages.

A certain amount of mixing is expected as children gradually master their target system. Sometimes, mixing is part of the child's target. When the people in the child's environment switch between languages freely, the child does, too. Lanza (1997) has shown that child rates of codeswitching follow closely on parental codeswitching rates, and also reflect the kinds of responses parents make to a child's switched utterances.

21.3.3 Non-converging Dialogue

Another manifestation of the bilingual mode is **non-converging dialogue**. In these asymmetrical conversations, bilingual and monolingual modes are mixed, so that people speak to each other in different languages. It is common for a parent to use a minority language and their child to respond in the majority language. Or, when parents who speak different languages to their child address each other in the child's presence, they may choose to have non-converging conversations in which everyone is using a bilingual mode receptively to understand either language, but each person uses a different monolingual mode expressively.

21.4 Research Areas

Research in child bilingualism spans the gamut of child language topics, but is concentrated on issues unique to bilinguals. Since a true experimental design is impossible—families cannot be randomly assigned to raise children bilingually or not—most of the research is either quasi-experimental, using already constituted groups that

are as similar as possible, or involves short-term manipulations. One very strong paradigm uses two monolingual control groups for the bilingual group, one for each language (viz. Caramazza *et al*., 1973).

Interest is particularly great in the relationship between a bilingual's two languages, including how they are represented in the bilingual brain, and whether the representation will be different depending on when the languages were learned relative to each other, early versus late. Other lines of research seek to determine how bilingual learning might differ from first language learning in monolinguals, for example, whether it is slower or less complete than FLA. Finally, many investigations explore the implications of two languages for educational and social policies.

21.4.1 One-Language-or-Two in Development

21.4.1.1 Single representations versus dual (separate) representations.

Historically, there has been great emphasis on trying to determine how bilingual children develop their two languages: Do they start with one "unitary" system, with elements of both languages and gradually differentiate their single system into two systems? Or, do they have two languages from the outset, building both "from the ground up." Early observers like Leopold (1939) proposed the former, that children start with a single, fused system which later differentiated into two. Volterra & Taeschner (1978) took that idea further and proposed that the language separation took place first in the lexicon and then later in the grammar. From the perspective of phonology, Schnitzer & Krazinsky (1994, 1996) suggest that the locus of differentiation is even more specific, that children first differentiate vowels, in the second year of life, and subsequently their consonants.

Much of the evidence for the "unitary theory" came from observations of children using the same elements and processes in both languages or mixing elements of one language in the other. However, as more recent formulations argue (Paradis & Genesee, 1996), children do not randomly use elements of both languages together regardless of the context, as they would if they had completely fused systems. Even two-year-olds with unbalanced proficiency use the language called for in the situation statistically more often than the other language (Genesee, Boivin, & Nicoladis, 1996). Still, the existence of two separate systems does not mean that there is no influence of one language on the other.

Hulk & Muller (2000) argue that bilinguals develop like monolinguals of each language. Bilinguals do not take structures from their stronger language and use them in the other, but one language may still influence the acquisition of the other. They argue that when there is overlap at the surface level between structures in an individual's two languages, exposure to the structure in one language is taken as evidence for the structure in the other. The child will persist in that interpretation until more specific evidence from the second language permits the child to move from a more inclusive single (universal) analysis to two language-specific analyses. In their view, cross-language influence is limited to certain parts of the grammar and is more constrained than transfer.

21.4.1.2 Psycholinguistic and neurological evidence for the dual system hypothesis. Tools of analysis from psycholinguistic experiments and neuro-imaging provide further evidence against the unitary period in bilingual children's development. Around six months, when monolingual infants move from being universal listeners, (that is, they are equally sensitive to potential contrasts in any language), to becoming more responsive to their ambient language than to others (Werker & Tees, 1984, 1992),

bilingual infants give signs of recognizing the sounds of their two languages and also distinguishing between them (Sebastian-Galles & Bosch, 2005).

Brain imaging techniques also offer new (but somewhat contradictory) evidence about whether the bilingual's two languages appear to be fused or distinct. In the 1800s, aphasia studies had already suggested that bilinguals' two languages could be stored in different locations in the brain. When bilinguals suffer a stroke or other trauma to the brain, in most cases both languages are affected, but often enough it happens that one language is impaired and the other spared. When a number of bilinguals with aphasia were found to have damage not in the typical left or language hemisphere, but in the right hemisphere, it gave rise to the hypothesis that bilinguals might expand their language capacity by recruiting space for language in the right hemisphere (Albert & Obler, 1978). Further, the well-known plasticity of children's brains, which allows a damaged language center to relocate a first language to the right hemisphere (Caplan, 1980), also fueled speculation that in the right conditions, healthy (bilingual) brains could recruit the right hemisphere for language.

The bilingual aphasia evidence is ambiguous (Solin, 1989), but the proposal seems to have a kernel of truth. New, non-invasive imaging techniques like fMRI, PET scans, and ERPs, provide data from healthy individuals in the act of producing or understanding language stimuli. Experiments that map the activity of the brain while people are speaking or listening to one or both languages show activation for the two languages within the same or different spaces. Kim *et al*. (1997) suggested that the organization of two languages in the brain is a function of when they are learned relative to each other. They showed that when highly fluent child bilinguals were processing

speech, the two languages activated the same areas of the brain, but when the subjects were late bilinguals, some areas activated did not overlap. In other studies (e.g. Perani *et al*., 1998), the key variable appears to be proficiency and not age of acquisition (although clearly the two are related). When the second language is more recent and less fluent, it might take up more space, whereas two highly practiced languages would be handled efficiently in one area within one hemisphere. This pattern seems analogous to the pattern of development observed more generally for less practiced behaviors to involve a larger area of weaker connections. As the behaviors become more practiced, they become more "focal," with stronger responses from fewer neurons (Eliot, 1999).

Using infra-red spectoscropy, Shalinsky *et al.* (2006) compared monolinguals with bilinguals when they were speaking in only one language (monolingual mode) and also when they were switching between languages (bilingual mode). In monolingual mode, the activity seen in the left hemisphere was the same as for monolinguals. However, when the bilinguals did a task that made them switch back and forth between their languages, there was activation in the analogous areas of the right hemisphere as well, in areas distinct from the first language.

Thus the neurological evidence seems to suggest that the bilingual brain does recruit more cortical areas for language than the monolingual brain, and to some extent or for some period of time, it may represent the two languages somewhat separately in different locations in the brain.

21.4.2 How is Early Bilingual Learning Different from Late SLA?

Some people suggest that children are not better second language learners than adults, but they learn in more helpful contexts and are less inhibited than adults. Evidence from diverse domains contradicts that view. In regression studies that include psycho-social variables along with age of arrival or length of residence, motivations and attitudes contribute very little if anything to the prediction of skill in the second language (DeKeyser & Larson-Hall, 2005). Furthermore, learning a second language early results in different patterns at the processing level than if the individuals had learned the language later. In general, early bilinguals appear to have similar patterns to first language learners for each of their languages. However, the phenomena are multi-faceted, and so even for the early bilingual, some features may be similar to patterns observed in monolinguals of each language while others show a bi-directional influence of the languages on each other. Still, such influence is generally more subtle in early bilinguals than for late bilinguals, who are more likely to use the same processing patterns and biases in the second language that they learned for the first.

21.4.2.1 Evidence from syntax. Cross-language influence of this type is illustrated by work in syntax by Dussias (2001) in a series of experiments with ambiguous relative clauses. In a sentence like "He shot the servant of the actress who was on the balcony," the final relative clause could be attached to the higher noun phrase ("servant") or the lower noun phrase ("actress"). Both options are possible, but English speakers have been shown to prefer low attachment (Frazier, 1987), whereas Spanish L1 speakers favored high attachment (Cuetos & Mitchell, 1988). In Dussias' work, late bilinguals showed the preference from their first language regardless of whether the sentence was in English or Spanish. By contrast, early bilinguals showed an intermediate pattern, that is, less low

attachment bias for English stimuli and more low attachment bias in Spanish than the respective monolinguals.

21.4.2.2 Evidence from phonology. Zampini & Green (2001) replicate and extend early work by Caramazza *et al.* (1973) which showed early bilinguals' segmental productions to be close to the respective monolinguals' (although their perception patterns were more mixed). Voice Onset Time (VOT), the interval between the release of air from the mouth and beginning the vibration of the vocal folds, has been identified as a sufficient cue to distinguish voiced from voiceless stops. In English, the VOT for the voiced stops are considered to be "short-lag," that is, in the vicinity of 20 ms, whereas the voiceless counterpart is "long-lag," generally greater than 35 ms. Spanish also has a voiced/ voiceless stop contrast, but VOT production values measured for Spanish monolinguals are shifted "downward." Thus, the Spanish voiceless stop (/p/) is short lag (like the English voiced /b/), and the Spanish voiced /b/ is still shorter, that is, prevoiced with VOT -30 ms or less. Zampini and Green showed that the productive VOT values of early bilinguals (but not late 2nd language learners) matched those of monolinguals in the respective languages.

However, for these same subjects, even the production pattern was different from monolinguals when one looked at another parameter that distinguishes the voiced/voiceless contrast for Spanish speakers, the length of the Voiceless Closure Interval (VCI). The VCI refers to how long the speaker keeps the closure before the release burst (i.e. the interval before the VOT interval). For English speakers, the Voiceless Closure Interval is the same for /b/ and /p/, but in Spanish, this interval is much shorter for /b/ than /p/ (10 ms versus 70 ms on average). Like the English monolinguals,

early bilinguals showed no difference in closure time in English, and like Spanish monolinguals, they showed a large (50 millisecond) difference in Spanish. However, unlike the monolinguals, their closure value for Spanish /b/ was as high as the monolingual values for English /b/. In order to create the contrast in Spanish, the bilinguals' voiceless closure interval for Spanish /p/ was that much higher again than their /b/, making it higher than the Spanish monolinguals' /p/. Thus, the representations in each language seem distinct, but they also show influence of one language pattern on the other. As in the sentence parsing example, the early bilinguals were both the same as and different from the respective monolinguals.

21.4.2.3 Evidence from semantics. Unlike phonology and syntax, semantic processing is thought in general to be less tied to the requirement of early acquisition of the L2. In electrophysiological studies by Weber-Fox & Neville (1996), measures from event-related-potentials (ERP) showed differences between early and late groups with respect to closed class words (i.e. function words), but open class words (nouns and verbs) and semantic anomalies were less sensitive to whether the participants were early or late learners. Illes *et al.* (1999) also found that some tasks, especially those that tapped semantic skills such deciding whether a word was abstract or concrete, showed only a small and inconsistent effect of age of acquisition.

One of the main issues addressed in this area of research has been how different groups of bilinguals represent and access the words from their two languages in semantic memory, especially whether the words are represented in one merged storage area for both languages, or a separate storage area for each language. Current models of semantic memory propose more than one component (e.g. Kroll & de Groot, 1997), so it is

possible for word representations to be partially shared and partially separate. For example, there is considerable cross-language intrusion in memory tasks involving mixed-language sets (Francis, 2005). In fact, memory for which language an utterance is spoken in is very poor. Kintsch (1970) showed that when recognizing items from a previous list, subjects were twice as likely to misclassify the language than to fail to recognize an item.

Data from priming experiments permit inferences about the relative association by form and meaning of words in a bilingual's two languages. In priming, a stimulus is used to sensitize the subject to a later presentation of the same or similar stimulus Work by Sánchez-Casas & García-Alba (2005) contrasted four classes of words: identical words, cognates (which share both form and meaning, like "tower" / "torre"), translations equivalents that share the same meaning but do not sound similar (ex. "book" versus "libro"), and false cognates, words of the same shape but with different meanings, like "librarie" in French to mean bookstore, not library. At most timing intervals, cognate priming was almost as effective as priming with the exact same word, whereas non-cognate translation equivalents showed only a modest cross-language effect unless the priming interval was very long; false cognates showed a negative effect, unless the priming interval was very short (Sánchez-Casas & García-Alba, 2005). Sánchez-Casas and García-Alba interpret these results as support for Kroll and de Groot's (1997) hypothesis that a word's form and concept are represented separately. The result with false cognates shows that the representation of the word form is activated in the early stages of word recognition, whereas the non-cognate translation equivalents suggest that conceptual representation is accessed later. Cognates, which have both form and concept

associations, are effective for priming at all phases, and as effective as if they were repetitions of the original word. The magnitude of the priming effect for cognates is the same as for different forms of the same word, for example "door/doors" within languages and closer than within-language synonyms (which also share meaning but not form).

So there is considerable evidence in different domains of language that the outcomes of early bilingual learning—for BFLA and also for early SLA—are qualitatively different from later learning. However, little work has been done to delimit the differences between BFLA and early SLA.

21.4.3 How is Bilingualism Different from Monolingualism?

Another common thread in the research literature on bilingual children concerns the relative advantage or disadvantage of bilinguals vis-à-vis monolingual children in language or cognitive development. As chronicled in a review by Hakuta (1986), comparisons of bilingual and monolingual children in the first half of the 20th century reflected the anti-immigration attitudes of the times. Bilinguals were typically immigrants, and immigrants did poorly in school, so by a logical fallacy, bilingualism was seen as the cause of children doing poorly in school. When confounding factors like poverty and educational background were controlled for, and when children were tested in a language they could understand, most comparisons were no longer unfavorable for bilinguals (see also Oller & Eilers, 2002).

21.4.3.1 Bilingual developmental milestones. Given the great variability in typical language acquisition milestones, it is very difficult to find statistical differences between matched bilingual and monolingual groups on any measures of language

functioning. (School performance is a separate issue that we will address in Section 21.4.3.4.) Many early language milestones are similar, regardless of which language children are learning, or how many languages they are learning. Mature babbling typically appears at around 6 months of age, first words around 12-14 months, and first two-word combinations around 18-25 months (Fenson et al. 1994).

A similar timetable is observed for bilinguals, although often a child will be roughly comparable to a monolingual in only one of the two languages, not both. In fact, the bilingual groups that have been examined are squarely in the middle of what norms we have. (For babbling, see Oller *et al.*, 1997; for 1st words, Pearson & Fernandez, 1994; and Petitto *et al.,* 2001; for early syntax, see reviews in de Houwer, 1995, and Genesee, Paradis & Crago, 2004.) Based on their own work and that of a large Bilingual First Language Acquisition research project in Hamburg Germany (Meisel, 1994), Genesee, Paradis, and Crago (2004: 73) conclude that bilinguals follow the same course and rate as monolinguals in each language in many aspects of their development, "from the sound system to grammar."

21.4.3.2 Metalinguistic comparisons. In other language domains, bilinguals appear not just to equal monolinguals, but to exceed them. For example, bilinguals have been shown to excel at **metalinguistic awareness**, a skill associated with learning to read and write. It also helps children learn a third language (Bild & Swain, 1989). One illustration of precocious meta-linguistic awareness--that children can manipulate words independently of the sentences they occur in--is their ability to switch names for things without switching the object being named. In a study by Cummins (1978), while both monolinguals and bilinguals were able to agree, for example, to call the moon "the sun,"

bilinguals were better at realizing that the night sky would still be dark, even with a moon that was now called 'sun'.

Similarly, at the emergent reading stage, work by Bialystok (1991) showed that bilinguals were more than a year in advance of the monolinguals in recognizing that print does not change what it says depending on what it is labeling. In a pre-reading stage, children can usually say that a card under a toy rabbit says 'rabbit', but the harder test is to know what is on the card when it is moved under a bird. In Bialystok's study, only 18% of the bilinguals at this stage of emergent reading erroneously said "bird," whereas 62% of the monolinguals gave that answer. The 4-year-old bilinguals were ahead of the 5-year-old monolinguals on this task.

The bilingual advantage in reading was shown in a language and literacy study of 960 English-Spanish bilingual and English monolingual children in kindergarten, 2nd and 5th grade in south Florida (Oller & Eilers, 2002). Half of the bilinguals were in 'one-way' English-only schools, learning Spanish at home, while the other half were in 'two-way' dual language programs, where they learned to read in two languages from the very beginning. By second grade, differences in reading skill between the groups had emerged, favoring the group with instruction in two languages, and the advantage was maintained at fifth grade. The most striking observation was that learning to read in Spanish as well as in English had clear benefits in terms of the children's reading scores not just in Spanish, but in English as well.

21.4.3.3 The effect of bilingualism on cognition. Research on the cognitive abilities of bilinguals conducted by Peal and Lambert (1962) is often credited with turning the tide toward more positive views of childhood bilingualism. These authors

showed that bilingual elementary school children were more divergent thinkers, better problem solvers, and ahead in content in school than matched monolinguals.

Bialystok (1999) proposes an Analysis and Control model to explain bilinguals' advantage in some tasks but not in others. According to this model, bilinguals and monolinguals perform equally well in analysis tasks, which demand explicit abstract representations, such as recognizing syntactic errors in speech. By contrast, bilinguals do better in "control" tasks, those which require them to focus on just one or two aspects of a task while *suppressing* attention to its other aspects. To be successful, the participant must ignore conflicting or extraneous information.

Bialystok (1999) used the dimension change card sort task to show bilinguals' superior selective attention. She asked subjects to sort a set of cards twice, once according to the color of the figures on the card, and a second time sorting according to the shape of the figures. Bilingual and monolingual children did the first sorting equally well. However, on the second sort, bilingual children responded more accurately and more quickly. They were better able to put the old response aside and pick up the new one.

21.4.3.4. Areas of slower development. In the two areas of grammar that are most sensitive to the amount of language exposure, vocabulary and morphosyntax, one may see a slower pace of learning in bilinguals compared to monolinguals. However, this difference need not translate into an academic deficit. We examine in this section how bilinguals' slower pace of learning in these domains relates to other academic skills differently than for monolinguals.

Bilingual children are by no means poor word learners. Their total lexicons—counting both languages—are considerably larger than those of monolinguals for reception and generally equivalent for production (Pearson, Fernandez, & Oller, 1993). However, in the early stages of vocabulary development bilingual children may know fewer words in each language (perhaps as much as 30 or 50% less). Gathercole (2002) suggests that there is a threshold mechanism. Learning is directly related to exposure up to a "critical mass." Once the critical mass is achieved, exposure differences will have less effect.

During the time when their single-language vocabularies are smaller, the close association often observed in monolinguals between vocabulary size and cognitive and academic measures is not observed in bilinguals. Oller, Pearson, & Cobo-Lewis (2007) have demonstrated what they call a "profile effect." Bilingual and monolingual children took a battery of separately scaled tests covering oral language skills including receptive and productive vocabulary and literacy skills. Means for the monolingual groups in the separate tests were around the standardized mean of 100 across the board. That is, vocabulary patterned with the other skills. The bilingual group means for most tests were also around the standardized mean of 100, except in vocabulary, where the decrement ranged from 10 to 26 points. Thus, despite their lower scores in vocabulary, their scores in the other skills tested were not depressed. The extra time needed for them to reach a threshold, or "catch up," in vocabulary did not appear to affect their language and literacy skills overall.

A similar dissociation has been shown between morphosyntactic accuracy and other language skills. That is, when words do not follow a general rule, but have

irregular forms, like many plural forms in English (e.g. “sheep-sheep”), it takes longer to amass enough exposures to the forms to learn the irregulars. In a study of several hundred stories retold by monolingual and bilingual school children, discourse skills correlated closely with morphosyntax scores for the monolinguals, but not for the bilinguals (Pearson, 2002). In monolingual children, the failure to have developed key areas of morphosyntax is often taken to be a sign of a processing problem indicative of a language delay more generally. In a bilingual child, by contrast, it is usually just an indication that the child had not yet had enough time and opportunity for exposure to the items equivalent to monolinguals.

21.5 Practical Implications of Bilingualism

21.5.1 Education for Children with Two Languages

21.5.1.1 Immersion schooling. Communities (and families) that wish to support children’s growth in a minority language can follow Fishman’s (2001) advice to set aside times and functions for the minority language. Schooling in the medium of two languages supports families’ efforts to keep up the minority language without harm to the majority language (Oller & Eilers, 2002). Wong-Fillmore (1991) showed that families whose children went to English-only preschools were five times more likely to drop the minority language in the home than families of children who went to minority language, or bilingual preschools. Among the Inuits of Canada, Allen (2007) also documents the diminished use and loss of proficiency in the minority language among school children instructed in an L2 with higher prestige, English or French. Within the first year of schooling in L2, Inuktitut proficiency declined significantly relative to children who were

schooled in Inuktitut. Within two years, the gap widened, especially in the language for academic proficiency (as opposed to conversational proficiency).

In contrast, Allen did not find the loss of L1 when two high prestige languages were involved. For example, French-speaking children schooled in English did not lose their French. Canadian immersion programs have been in operation for decades, teaching English-speaking children French without loss to their English (Swain & Lapkin, 1982). Likewise, in Northern Wales, making the minority language Welsh the language of instruction in public schools (since 1993) has led to the first upturn in the use of Welsh for more than a century. This has been accomplished without detriment to the children's English (Gathercole, 2005).

21.5.1.2 Dual immersion schooling. However, strong arguments are made for children's need to learn the language of power on an equal footing with monolingual speakers in their country. One successful "compromise" model used in the U.S. is called dual immersion, or two-way schooling, where school subjects are taught in both the majority and minority languages equally. Children begin their academics in a language they know well, but do not delay learning in the majority language as well. Carefully controlled comparisons between children in two-way schools versus English-only schools in Miami showed that by 5th grade English scores for children in the two school types had only one standard score point difference, whereas the Spanish scores were 10 standardized points better on average for children in the two-way schools (Pearson, 2007).

Children in the two-way school could study the minority language without loss to the majority language. Furthermore, shared language provides a clear mechanism for

helping the children identify with individuals in other ethnic groups. Learning a second language can play a crucial role in breaking down prejudice and fostering positive attitudes toward members of other groups as demonstrated by Wright and Tropp (2005). However, the small number of two-way programs in the U.S., around 300 according to a database maintained by the Center for Applied Linguistics (Howard & Christian, 2007), means that U.S. policy makers have not heard or have not listened to the research evidence.

21.5.2 Language Impairment and Bilingualism

In a comprehensive treatment of the topic of language impairment and bilingualism , Genesee, Paradis, & Crago (2004) demonstrate that most bilingual children with language impairment in one language show equivalent disorders in both languages—but different languages present different areas of vulnerability, so the actual symptoms of the disorders will be different in each language. With bilingual children whom one suspects of having a language impairment, Genesee *et al*. (2004) caution, only in rare cases will dropping one language, especially a first language, solve the language problem. Often it will cut children off from their most effective sources of help. By contrast, many cases show that children with language impairment can use two languages--at the same level they would have learned just one. Bilingualism does not appear to cause or aggravate the language impairment.

However, it is important to distinguish between failure to use a feature of the morphology correctly (like lexical and grammatical gender agreement) because of faulty processing that prevents children with the same input conditions from learning like

typically developing children and the absence of that morphology because of diminished input. Since bilingual children with SLI show both effects—a processing problem and diminished input--their morphology will show more errors than monolingual children with SLI (Baker & de Jong, 2007). There is evidence for several constructions (Gathercole, 2002) that bilinguals reach a critical mass and "catch up" with monolinguals on points of morphosyntactic development. However, there is no evidence that processing problems associated with SLI will be eliminated if only one language is being learned.

21.6 Conclusion

The ability to learn two languages is within the human endowment, but not every child in a bilingual setting becomes bilingual. In a survey of 18,000 households in Flanders, de Houwer (2007) found approximately 12% reported that two or more languages were spoken in the home. Of that number 75% reported that their children were bilingual. While it is clearly possible for children to become bilingual, it is not guaranteed. De Houwer's surveys confirm that parent attitudes are the best predictors of whether the parent will provide circumstances with adequate input in a minority language for their children to learn it (Pearson, 2008). Early dual language learning, parents and schools have found, cannot be coerced; but with encouragement and continual reinforcement, children around the world can flourish in two languages.

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