# The Bilingual Brain

## Cognitive Effects of Multilingualism

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# Introduction

Bilingualism, though considered unusual and difficult to attain by many in the United States, England, and other Western cultures, is actually the norm in much of the world. About half of the world's population is natively bilingual (Fromkin, Rodman, and Hyams, 2007). Many countries throughout the world have more than one official language, unlike the United States or England. In Canada, places such as Alberta, Prince Edward Island, and Nova Scotia speak English, while many of those who live in other provinces—Quebec, for example—primarily speak French. Many Canadians can speak both English and French because of the need to communicate. Those living near the border between two countries may learn both the language of the country they live in and that of the neighboring state because of the back-and-forth flow of people between the two and because of the need to travel within the bordering region. Those living in the southwestern United States can often speak Spanish as well as English because of their proximity to Mexico or personal background. Areas with large immigrant populations, such as southern Florida, also have large bilingual populations, both of people native to the area and of those immigrating into the area. Other regions, such as French (Francophone) West Africa and Latin South America, have many local languages spoken by nearly everyone in the home existing alongside the language of the colonial power that formerly ruled over the area, which is usually spoken at school and in the workplace. In such areas, nearly everyone speaks two or more languages fluently. These are just a few examples of how wide-spread is "political" bilingualism—knowing more than one language as a result of the political situation or geographical location in a certain region—to say nothing of knowing multiple languages because of more individual factors, such as immigration status or the languages known by the parents.

In this paper, I plan to explore bilingualism to help dispel some of the old negative opinions and explore new outlooks on the process of learning more than one language. If we are to look at bilingualism, particularly bilingual language acquisition, and to compare its effects to those of knowing only one language, we first need to examine a few background concepts. First, it is beneficial to understand how monolingual children go about learning their language. Next, the different ways that children are exposed to multiple languages have a huge effect on the extent of bilingualism, which, in turn, can change the cognitive benefits and detriments that the child exhibits and the extent to which they are present. Perceptions of bilingualism have changed over the years, and research done before the 1960's—which suggested negative effects of knowing multiple languages—must be examined in order to be able to uncover the reasons behind biases against bilingualism, while more recent research can give a balanced look into the cognitive effects.

Chomsky's theory of Universal Grammar, the underlying set of rules that all human languages must share, posits enormous consequences on early childhood language acquisition, both monolingual and bilingual. There are disadvantages as well as benefits to being bilingual, mainly stemming from the different strategies employed in acquiring language. Mixing his two languages is a definite possibility for a bilingual, but bilinguals employ several different approaches in the attempt to keep their languages separate in their mental representations. When speaking to others who know the same two languages, however, they do often use sentences where aspects of both languages are present. This is called code-switching and is a common and perfectly acceptable speech method within bilingual communities. Learning one language is hard enough. Acquiring two and being able to differentiate and alternate between them is even more impressive. The topic of this paper is to look into this accomplishment and into the effects it can have on cognitive processing.

## Language Acquisition

Generally speaking, the process of learning a language is at once one of the most complex cognitive tasks a person will be expected to perform in his life, and one of the most basic. Language has the capability to express an unlimited number of ideas, and a child must learn to make word choices quickly, rapidly deciding how to combine and arrange them. He must organize every piece of information he gathers about his language so that he can access it later. Obviously, forming this language model takes an incredible amount of cognitive effort, and yet, except in extreme circumstances every person born will learn at least one language in his life. And, just as nobody teaches children to walk, no one is explicitly taught how to use language (Noam Chomsky in Fromkin, Rodman, and Hyams 2007: 318). We encourage and model, but do not actually teach, for what other tool could we employ to do so besides language. Instead, speaking simply comes naturally to children, though they must often learn the rules of their language from exposure to speech that is ungrammatical or difficult to analyze (Fromkin, Rodman, and Hyams 2007: 314). As a response to this perceived "poverty of the stimulus" problem, Noam Chomsky put forward the Universal Grammar Theory—the conjecture that the ability to quickly and effectively learn language is imbedded within our neural connections from birth. His theory states that the results of language acquisition depend very little on the type of speech to which the child was exposed (Fromkin, Rodman, and Hyams 2007: 319). Normal conversation is more than enough to equip the child with the tools needed to correctly infer the rules of language. Chomsky theorized that there must be an innate template in children's brains with "switches" that can be flipped from their default settings—or not—as the child acquires language (Snow 1993: 318). This may lessen the effort it takes to learn to speak and make it more feasible to become bilingual or to learn a second language after infancy. Though no special type of language-learning environment is required, exposure to language alone is not

sufficient for children to determine the rules of grammar and syntax. They need both exposure and interaction in order to to get information and test their current theories (Berko-Gleason 1980: 20). Such interaction usually takes the form of baby talk.

Baby talk, or 'child-directed speech'—CDS—is present in every culture in the world, though the form it takes can vary from society to society (Berko-Gleason and Bernstein Ratner 1993: 311). People speak slowly and clearly to children and exaggerate the intonation. They employ a higher-than-normal pitch and use repetition and simple vocabulary, also usually presenting grammatical sentences (Berko-Gleason and Bernstein Ratner 1993: 311). However, baby talk is not syntactically simpler than normal speech. Instead, it "contains a range of sentence types such as questions…embedded sentences…imperatives…"and" negatives with tag questions (Fromkin, Rodman, and Hyams 2007: 318)." These structures can occasionally give even an adult speaker pause, and yet we supply such sentences to the youngest among us and expect them to correctly analyze these phrases and extract the rules of language from them. But it is most likely due to the fact that we are exposed to these varied types of sentences from such an early age that we are able to discover the rules of language. Infants may especially notice the higher register used in child-directed speech, and this increased attention can draw their awareness of correct grammar and equip them with all the data necessary to determine the rules of grammar.

## Stages in Language Acquisition

At every point in language development, children conform to a set of rules they have developed up to that point (Fromkin, Rodman, and Hyams 2007: 322). As a child learns his first language, no matter what it is destined to be, he goes through universals stages in acquisition (Fromkin, Rodman, and Hyams 2007: 319). Young infants begin by repeating basic syllables containing a wide variety of consonant and vowel sounds, some of which are not found in the child's target language. During this babbling period, however, the child's "speech" gradually begin to focus on one language's phonological inventory (Berko-Gleason 1980: 18). He is starting to prepare and tune his awareness of language for a particular tongue, beginning by recognizing and practicing the sounds that are its basic building blocks. The child also begins to practice intonation, first adding breaks and pauses in his babbling (Berko-Gleason 1980: 18). He places emphasis on occasional "words" and syllables and changes the intonation of these phrases. He soon sounds as if he is trying to actually communicate whole thoughts to those around him. This stage of tonal babbling is the finak phase of creating nonsense sounds, and the last step before children acquire their first words.

As children begin acquiring words, their pronunciation of these words will almost never resemble the way adults in the society say them (Fromkin, Rodman, and Hyams 2007: 328). These changes may seem random, but closer examination uncovers a system of rules used to transform and simplify these early words. Certain types of sounds are harder to pronounce than others. Difficult sounds tend to turn into easier, more basic consonants, such as "r" becoming "w" in "wabbit" or "l" developing into "y" in "yight". Consonant clusters become simplified into one or the other of the letters. Children may say "stairs" as "tairs" or "teet" for "treat". Multi-syllabic words are turned into a single reduplicated syllable, usually the stressed one, such as "wawa" for

"water". These first words indicate the point in linguistic development is called the "holophrastic stage", so called because children attempt to convey complex meanings with only a single word (Fromkin, Rodman, and Hyams 2007 325). For example, the word "Sock!" could mean many things, depending on context. It could mean "My sock has fallen off!" or "Look! A sock!" or any number of other things. As the child grows older, however, and he gains more knowledge of the grammar of his native language, he is more able to express himself clearly and explicitly. He then passes from the holophrastic stage and enters into the two-word period of language development.

In this period, children begin stringing two words together (Berko-Gleason 1980: 18). Though this allows the child to become more specific, he could still be attempting to express any number of ideas. "Mommy sock," could indicate a sock which belongs to Mommy, or the child could be pointing out a sock to his mother, or perhaps even asking his mother for a sock. Though adult speakers of English would never consider this sort of utterance correct, this stage is vital to the linguistic maturation of the child, as it indicates his developing awareness of the relationships among elements in a sentence. He starts to show understanding that words can be strung together to create and specify meanings. Then the child begins to realize that generally, the more words in a phrase, the more easily others around him will be able to understand his intended message. He enters the "telegraphic stage," now speaking in short, three- or four-word sentences without much inflection and without any of the function words such as conjunctions, prepositions, or articles (Fromkin, Rodman, and Hyams 2007: 334). In languages that require the conjugation of verbs, however, children do acquire the use of verbal inflection early on in their language development, since they do not hear unconjugated verbs in their language (Berko-Gleason and Bernstein Ratner 1993: 317).

After the telegraphic stage, with its short, simple, incorrect sentences, the child begins to learn grammatical and syntactical rules in an order specific to

the language he is learning, correlating with the frequency with which the rule or construction appears in the language (Fromkin, Rodman, and Hyams 2007: 339). An English speaking child learns to use simple declarative sentences first. They offer a starting point to realizing connections between sentence elements. The child next forms negative sentences. But learning to negate statements requires realizing the insertion of both a negation word—"not", "no", "never", etc.—and of an auxiliary verb, a word that serves no meaningful purpose in the sentence except to act as a place-holder. This added word is almost always "do". Children can take a fair amount of time to grasp this "do-insertion". Once a child understands the use of this auxiliary, though, he is able to acquire the correct forms of other constructions that use such auxiliaries, like questions, more quickly. Questions use "do" and other auxiliaries the way negative sentences do, though interrogative sentences also require changes in the word order. A do-insertion occurs between the subject and the verb but is then immediately moved to the first position in the sentence. Finally, the passive construction is among the last syntactical rules learned by infants born into an English-speaking environment. This construction can be difficult for a child to grasp, as it changes the typical word order and promotes what would otherwise be the object of the verb to the subject and demotes the subject to expression in an optional "by" phrase. The object undergoing the action is now the first element, and the subject performing the action, the last. This switching around is counter-intuitive. This list of grammatical structures in English is by no means comprehensive, but instead gives a few examples of how the frequency of usage and the complexity of constructions can play a large role in the stage at which the child learns them, as well as attempting to demonstrate that language learning is a cumulative process. Each piece of information is important in developing and processing the next piece.

## Methods of Bilingual and Second Language Learning

There are many different conditions under which a person may learn another language. Formal language courses, perhaps the most common circumstance—and the one most familiar to many of us—are considered by most experts in the field to be the least effective means of learning a second language, both in terms of acquisition and of retention of vocabulary and constructions. Though there are many different styles of language classes and programs, they are often taught—in Anglophone countries, at least—by speakers who learned the target language as a second language themselves, especially at the middle- and high-school level. Many heavily emphasize more passive learning, reading and writing only the constructions that have already been introduced to the student. These difficulties that stand in the way of successful language acquisition can also impede language retention, and what students have learned through the classes is quickly lost unless they purposefully seek out opportunities to reinforce their language skills. When they are exposed to a situation where skills in the language are needed, such as traveling to an area where the language is spoken, students often find that what they have acquired is not adequate for effective communication. However, although this is a poorer way to learn language, it does have some benefits, such as conscious consideration of differences and similarities between languages.

Another way that a child might learn to use multiple languages is using the "one parent, one language" method. This implies that from the very beginning, each parent interacts with the child in a different language. Keeping the two languages separated in the input will make it easier for the child to keep them separate (Fromkin, Rodman, Hyams 2007: 345). This method helps the child learn about the role of language in communication, and allows him to discover at an early age that expectations with regard to language will vary from

person to person and that he must teach himself how to meet these expectations. He does so by developing the ability to switch languages. This ability to change and control his use of language allows the child to develop metalinguistic awareness earlier. Metalinguistic awareness is a speaker's conscious knowledge about language and its use (Fromkin, Rodman, and Hyams 2007: 346). Knowing that linguistic representation is arbitrary and there is more than one logical way of forming a construction can draw the child's attention to how he himself conveys information and cause him to consciously direct his cognitive processes (Snow 1993: 396). Children raised in a "one parent, one language" environment show an improved understanding of communicative situations across languages (Snow 1993: 412). Bruce Bain and Agnes Yu determined in 1980 that though this ability to acknowledge the expectations of the situation appears early in life, the difference between bilingual children and monolingual children in performance on tasks requiring cognitive flexibility is not significant at 22 to 24 months (Bain and Yu, 1980). Bilinguals, however, undergo a significant cognitive acceleration between that time and four years of age, and Bain and Yu found a large difference between the groups on cognitive tasks at age 46 to 48 months. As a result of their exposure to two languages from birth and to the differing needs of individuals, children growing up in a "one parent, one language" home are almost always completely bilingual with no foreign accent in either language or persistent confusion between forms (Bain and Yu, 1980).

When they hear "bilingual," most people immediately think of an immigrant family. While it is definitely true that many immigrants are able to speak more than one language, the extent to which they are functionally bilingual can vary enormously depending on many factors. If a family moves to a new language environment after the child has begun to speak, some families choose to help their child learn his new language by speaking only that language at home. Depending on the age of the child at the time of the relocation, this will often lead to subtractive bilingualism, further explained in the next few

paragraphs. An older child, confident and adult-like in the use of his first language, will most likely retain full or almost full use of it. But in a young child, who has no, or only extremely limited, language knowledge, the new majority language may replace the native minority one. Though the child may retain some of his native tongue, he may not remain able to communicate with people of both language groups. On the other hand, if the parents continue to speak exclusively the minority language at home, the child will most likely undergo additive bilingualism. Though it is undoubtedly true that many immigrants are bilingual, many of the common misconceptions of bilinguals can come from looking at and studying only such individuals.

In general, though there are many ways of becoming bilingual to one extent or another, adding any amount of a new language will lead to one of two outcomes: additive or subtractive bilingualism. Additive bilingualism occurs when the learner's minority language is maintained and not replaced by the majority language. The child becomes completely bilingual and can usually eliminate any accent or indication at all that his adopted language is not his first and only. Instead of the new language replacing or hurting the old one, the two exist side by side. This can come about when the learner never becomes sufficiently fluent in his learned language to communicate smoothly—and so is unable to replace his native language—or when a child has constant need for both languages and neither is permitted suffer. Both languages are needed, and a child growing up in this situation thus values them separately. Besides children from an immigrant household, those who grew up in a "one parent, one language" home—already discussed in this paper—and those who learned a language at school, either through an hour of class a week or through fully bilingual or minority-language education, will tend to show signs of additive bilingualism.

If, on the other hand, a family moves to a new language environment and does not maintain contact with other people who speak their native

language, subtractive bilingualism is liable to occur. Their skills in their first language suffer because of the addition of a second language. Though this is not very common, it often occurs when there is little or no opportunity to practice a first language and no practical need to maintain that language. However, knowing and maintaining a language is hard work, and if the child does not use one of the languages, it will suffer. Sometimes, however, language interference occurs and the rules of one language merge into the rules of the other, or will switch between languages.

## Early Bilingual Research

Up until the 1960's, most researchers'—and indeed, society's—opinion of bilingual individuals was very negative. Their studies suggested that bilingual children were less intelligent than their monolingual counterparts. They almost always performed below the level of their peers on IQ tests, and fell behind in school and were often never quite able to catch up to their classmates. Many seemed to be socially awkward. They did not fit in with the "normal" children. As a result of these factors, in the popular opinion as well as in the scholarly world, bilingualism was an extremely undesirable thing. Those individuals who did know multiple languages were often outcast as a result. Immigrant parents stopped encouraging their children to use their native language at home in an attempt to allow them to fit in with the local children. All these things led to the view that being bilingual and knowing more than one language somehow negatively affected intellectual and cognitive functioning.

## Recent Bilingual Research

In 1962, Wallace Lambert and Elizabeth Peal looked at previous studies in order to design and guide their own research (Lambert 1977: 15-16). They noticed that many of the researchers who felt that bilingualism carried negative effects had overlooked critical factors that could account for these results. They performed their own study in which participants in the experimental group—the bilingual children—and in the control group—those who spoke only one language—were matched on a variety of factors, including socioeconomic status, the education level of the parents, and immigrant status. After putting the children into groups, Lambert and Peal found that, on the whole, bilingual children actually tended to perform better than the monolinguals within the same sector of the study on both verbal and non-verbal tasks. This suggested to them that there might be significant differences in the way bilinguals process not only linguistic facts, but also general information as well. Anisfield conducted a study in 1962 that supported and further elaborated on this conclusion. His "findings indicated superiority of bilinguals on intelligence subtests of a kind which require 'symbolic manipulation or mental flexibility.'" (Ben-Zeev 1977: 30) In other words, bilinguals are better at thinking in creative ways and at holding many seemingly unrelated ideas in their thoughts at once, creating relationships between them. This skill is enormously beneficial in problem-solving processes. These two examinations, along with several other studies not mentioned here, mark the beginning of the more modern perspective on the cognitive effects of bilingualism.

Most researchers today agree that though there are undoubtedly some noticeable disadvantages that come from speaking multiple languages, they appear early in language development and lessen as the child grows older, and there are definite benefits. Even as early as the 1950's, investigators studying bilinguals thought that though children speaking multiple languages are slower

in reaching early language milestones, there was no indication of decreased non-verbal intelligence. In 1953, Darcy determined that though bilinguals generally have a temporary language handicap, they do no worse on non-verbal tasks, and often do better than their monolingual peers. Recently, linguists conducting studies have even gone so far as to connect knowing a second language to improved writing ability and forming more complex sentences in a native language (Snow 1993: 403). They are discovering that bilingualism brings with it an improved metalinguistic knowledge, especially the awareness that words are arbitrary and very rarely have any inherent reason to signify the things or concepts they do. However, this is only one of the benefits conferred by the ability to speak more than one language.

## Benefits of Bilingualism

As earlier mentioned, recent research has indicated that, contrary to previous investigation, being bilingual is not in and of itself an obstacle to success. In fact, it can offer many benefits. A study asked two groups of young children—one bilingual, one not—to sort blocks of different shapes, sizes, and colors. The researchers told the children to categorize them by shape, then start over and organize the blocks by size, then finally by color (Ben-Zeev 1977: 36). They found that not only were the bilinguals able to switch into sorting by the new condition more quickly and effectively, but they also created subcategories and continued to group the blocks beyond what the experimenters had called for. This ability to change tasks completely and rapidly may lead to improved multi-tasking ability.

Another characteristic of bilingualism is a more complete metalinguistic awareness. Bilingual children realize the arbitrariness of the sign-signifier relationship because they already use two unrelated words to refer to the same concept. There is no particular reason that "cat" should mean a cat or "rabbit" should mean a rabbit, other than the fact that they do. Bilinguals also have a greater awareness of meaning and structure in language because they have two languages from which they can draw generalizations about the characteristics of languages instead of one. They have more information about how different languages form a construction and they are commonly able to learn other languages with less effort than it takes monolinguals (Fromkin, Rodman, and Hyams 227: 350-351). This could also be a result of previous practice in setting aside one language's grammar, syntax, and lexicon in order to examine these aspects in another language.

Knowing more than one language can allow for more flexible thinking and more creativity in thought processes (Ben-Zeev 1977: 36). Bilingual children are much more likely to examine the whole situation and look at all

possible solutions when faced with challenging circumstances. They are aware that the answer that first comes to mind is not always appropriate given the context and are more flexible in their approach (Ben-Zeev 1977: 30). They have greater abilities to reorganize verbal material and to manipulate language more flexibly (Lambert 1977: 16). Bilinguals are more sensitive to the cues of those around them, which is necessary in order to know which language is needed in a given exchange. The child pays close attention to other people's actions and reactions to figure out which of the two languages he must use in order to communicate with them (Ben-Zeev 1977: 40). Such sensitivity to feedback cues is one of the many tools bilingual children use in order to learn two languages and to discover where the boundaries between the two are.

Though there are many positive cognitive effects of knowing more than one language, these benefits usually only appear in children who are growing up in an environment favorable to bilingualism (Fromkin, Rodman, and Hyams 2007: 346). That is, children who are exposed to the appropriate amounts of the two languages, who are raised in a society that values both languages, and whose parents maintain an interest in their bilingual development, will show benefits while others may not.

## Disadvantages of Bilingualism

Children learning more than one language do have smaller lexicons in each of their languages than monolingual children do at a similar age, though this is hardly surprising (Fromkin, Rodman, and Hyams 2007: 344). A bilingual baby grows up being exposed to two languages—twice the amount of grammar, and twice the amount of vocabulary as a monolingual child (Ben-Zeev 1977: 35). He must spread his first words over two languages, and learn two names for everything. So he might be expected to have a vocabulary in each language about half the size as that of a monolingual child, but this is not necessarily the case. In fact, he may have a lexicon two-thirds to three-quarters the size of that of a monolingual child, actually giving him a larger overall vocabulary (Ben-Zeev 1977: 35). Names of common household items, like "cup" and "table" are likely to be encountered early in both languages, which can explain for this larger total vocabulary size. But because a young bilingual's lexicon in each language is smaller, this is often perceived as a delay in reaching the verbal milestones that linguistics love to examine and which pediatricians look for in order to assure the child is on track developmentally.

Bilingual children can seem to be failing to form a correct syntactical structure for each of their languages, and this can seem more worrisome than it necessarily warrants. When the fact is realized that, difficult as the task is of understanding and learning one grammar, a bilingual child must do the same for two syntaxes—besides the necessity of finding some way of keeping the two separate in his mind—it hardly seems surprising that he sometimes uses one language's construction with the other language's words. Bilingual children, however, have several strategies to attempt to keep the two languages separate in their minds.

## Strategies to Prevent Inter-Lingual Interference

A bilingual child may try to reduce interference between his two languages by simply becoming consciously aware of the differences between the two and how they form a certain construction (Ben-Zeev 1977: 31). Though this may seem to be a fairly obvious strategy, its importance cannot be overlooked. By consciously thinking about the differences, the child is more easily able to remember the differences and to correctly use them. Bilinguals also maximize the variation between languages, overlooking the exceptions to rules that converge or overlap (Ben-Zeev 1977: 42). They over-generalize the regularities within one language to take advantage of the differences between their two languages, which are similar to some of the mistakes that monolinguals make in their language acquisition. They form a keener awareness of their languages as internally consistent systems than do monolinguals because this understanding can be a way of keeping the two languages separate (Ben Zeev 1977: 45).

In addition to being aware of and maximizing the differences in structures between his two languages, a bilingual child also simplifies structure within one of his languages (Ben-Zeev 1977: 46). Once again, this closely resembles a monolingual child's process of language acquisition, but bilinguals may hold onto this simplified language structure for a longer time. All of these results could be expected, but a bilingual child uses this step to separate his two languages and reduce interference between them. If he can say that one language marks their verbs for person and number while the other one does not and be correct most of the time, he will do so, and continue until it becomes clear that the adult speakers around him expect more and he must make his view of the structure of the language more complex and use the more adult-like forms (Ben-Zeev 1977: 46). Another way that bilingual children simplify rules within a language is by using only one way of expressing an idea if a language

has more than one possible. However, comprehension precedes production, and they understand both formations when an adult uses them. But despite these strategies to reduce language confusion and overlap, bilingual children do still experience some interference and language convergence, though maybe not as much as some people believe.

## Cross-Linguistic Mixing and Code Switching in Bilinguals

As this paper has already previously mentioned, bilinguals—even young children—have a keen awareness of the linguistic needs of those around them. Though some amount of language mixing is a normal part of the early bilingual acquisition process (Ben-Zeev 1977: 32). If an older bilingual child knows that the person to whom they are talking knows only one language, the child will usually make every effort to communicate with them in only that language (Fromkin, Rodman, and Hyams 2007:343-335). For the most part, these attempts are successful, but often the child does not have identical vocabulary lists in his two languages. If he knows the word for the concept he is trying to express in one language but not in the other, he will usually use the word he knows, even if it is not in the correct language. He is perfectly aware that it does not belong in the conversation, but any word, in his mind, is better than no word. Or perhaps the word in one language simply comes more easily to mind than in the other language and he misspeaks. This is not necessarily a sign that the child does not know both languages, or that he is becoming irreversibly confused by learning two languages at once. Instead, this sort of misspeaking should be taken as just that: a mistake occurring as the child talks. Monolingual children—and adults—do the same thing, though because they use only one language, they simply say the wrong word. Since bilingual children have access to two languages, it is likely, perhaps even inevitable, that they will sometimes cross linguistic borders.

When speaking to a fellow bilingual, a bilingual child has no reason to make the extra effort to use only one language and so will create utterances that mix the two languages, a phenomenon called code switching. This, once again, is not a sign of interlingual interference, but is simply another way for bilinguals to use their speech capabilities. It is rule-governed and it is shown that the

speakers intend to switch languages before even beginning the sentence and plan accordingly (Malakoff and Hakuta 1991: 146-147). When code switching occurs in a Spanish-English bilingual, for instance, the person might say something like, "Quando tu going al supermercado?"—"When are you going to the store?" Spanish conjugates its verbs, so the subject—tu—would not be necessary if the entire sentence were in Spanish, but because English does not mark verbs for person, the Spanish subject is needed to clarify who is doing the action. The speaker knew from the start that he was going to use an English verb and anticipated his need to use a subject. It was not just a momentary bit of confusion or a slip of the tongue. Such mixing of languages is extremely common within bilingual communities and should not be taken as a sign of undesirable language interference, but as a kind of third dialect intermediate between the other two languages.

## Conclusion

Language development, both bilingual and monolingual, occurs in stages. First, children babble, eventually specializing in the sounds found in the language they are destined to learn, and then begin breaking down their stream of speech into smaller units and adding intonation patterns. All these stages condition and prepare the child to communicate. Around one year of age, children begin to speak. Their first utterances are one word "sentences", which can convey a large number of ideas. In this phase, and in future stages, children use a set of rules to simplify words. These rules can include reduplication of syllables, final consonant dropping, and substitution of easier sounds for more difficult ones (Fromkin, Rodman, and Hyams 2007: 328). Children then begin putting two words together, but there are still many meanings possible. From here, children enter the telegraphic stage, when they relate three or four words in a sentence but leave out inflection and words that can create more complex relationships between sentence elements. They then continue adding grammatical rules in an order specified by the language.

Universal Grammar is the innate syntax Chomsky hypothesized in all human languages. It is based on the idea that every language in the world shares a finite set of rules. This allows people to learn a second language relatively easily and quickly. Instead of having to construct the rule that English noun phrases are head-final from scratch, a child learning the language can simply look at the data around him, decide between two options—head initial or head final—and then "set" the language acquisition device to the selected setting. This can save cognitive energy and allow children to learn languages more quickly than they could if they needed to totally construct their rules.

There are two main types of bilingualism: additive and subtractive. Additive bilingualism occurs when the learner's first language does not suffer damage from the addition of a second, when there is still a need for the first

language. Learning a language through a class or program at school leads to additive bilingualism, as does speaking a minority language at home. Subtractive bilingualism, on the other hand, causes attrition of the first language. This is not very common, as it involves not having a need for the native language. It seems to mainly occur in immigrants with little contact with others from their homeland.

There are many types of conditions under which a child can become bilingual. The most common situation is perhaps immigrant families who speak a minority language at home and their new language in public. This is one of the situations likely to result in complete bilingualism, as is when the child's caregivers speak multiple or different languages from one another in the home, especially if the parents employ the "one parent, one language" method. This can help separate the two tongues in the child's language representation because they come in different inputs. A child, however, is less likely to be fluent in more than one language if there is no need for him to regularly use both languages, such as language classes in school or other language programs with little chance to utilize learned skills outside the classroom.

Before the 1960's, researchers used to consider being bilingual a disadvantage to the individual. Studies indicated that it made the children less intelligent and caused them to fall behind in school. The experimenters also felt that bilingual children were socially awkward. These studies, however, did not account for factors such as socioeconomic and immigrant status. Wallace and Peal noticed this and carried out a study where participants in both the variable group—the bilingual children—and the control group—the monolingual children—were calibrated for many of these factors. They discovered that the bilinguals actually performed better than the monolinguals on both verbal and non-verbal tests of intelligence.

As current studies show, bilingualism can be beneficial to a child, despite older research. It leads to improved metalinguistic awareness and

creativity in thinking. Though it may appear that it can be detrimental, most apparent disadvantages stem from the fact that they have twice as much to learn. In fact, some of the effects of the increased demands on the child's cognitive resources caused by this excess of information can lead to good results. For instance, the fact that the child needs to distinguish between his two languages leads to an increased sensitivity to feedback cues around him and to paying more conscious attention to things surrounding him.

The disadvantages of being bilingual are mainly verbal or language-related. Bilingual children tend to have smaller vocabularies in each of their languages, though this is hardly surprising, since they have twice the number of words to learn. They are slower to meet milestones of sentence complexity. Once again, with two languages to learn, they must spread their learning over twice the amount of syntax. Bilingual children may seem to mix their two languages, but there are many strategies they employ to keep the two separate in their mind.

Bilingual children can simply develop a keen awareness of the differences between the way their two languages form a certain construction. They maximize the differences between the two grammars, which can lead to over-regularization of structures and rules, just as monolinguals can apply a newly-learned rule in too many situations (Berko-Gleason and Bernstein Ratner 1993: 319). Besides simplifying rules between languages, bilinguals also make rules within one language simpler. This is called neutralization and often leads to the loss of exceptions to rules. But despite these strategies to separate the two languages, interference and mixing between them do occur, though much of the time, mixed sentences are due to code-switching.

Bilinguals are extremely sensitive to the language needs of those around them, but they will often produce mixed utterances when they communicate with other bilinguals. These sentences, however, have underlying rules guiding the formation and structure. Code-switching is planned for the entire utterance,

and bilinguals will look ahead to ensure that they provide the person to whom they are speaking with all the information they will need in order to fully understand the meaning of the sentence. It is only one of the results brought about by becoming bilingual. They also have a better and more complete metalinguistic awareness, leading to a deeper understanding of the uses of language. This could result in an easier time learning more languages in the future. They are able to switch between tasks more quickly than can those who know only one language, and may even have an improved multi-tasking ability as a result. Bilinguals tend to look at the whole situation and examine every possibility before taking action. They employ more creativity and flexibility in thought, and when asked to categorize something using a certain criterion, bilinguals often put the objects into subcategories, showing that they are constantly processing information they gather and trying to fit it into their already existent structures. Obviously, the old stereotypes of bilingualism were somewhat misguided, and instead, knowing more than one language is actually quite beneficial to many aspects of cognitive development.

comic from cover page found at: http://ldc.upenn.edu/myl/llog/Lojban.png

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