Adult Language Acquisition

by Dana Farkas and Jameson Packer

Language is universal. It serves as the basis for everything that defines human condition. It allows for communication, which acts as the thread that weaves together the very fabrics of society and defines culture and interpersonal interaction. It enables the expression of emotion, feeling, pain, joy, ideas, and the innermost thought processes of the mind. Language permeates throughout every aspect of life; it is inescapable. Composed of both vocal and physical components and cues, even those who do not possess all of the sensory abilities use language fluently. Deaf, mute, or fully capable, language is universal.

With over 6000 living languages around the world, it is clear that humans have an innate ability to invent, learn, and master language. Proposed by Noam Chomsky during the rise of linguistic studies during the middle half of the 20th century, the theory of Universal Grammar purports that the human brain is hardwired for acquiring language and "all human languages are born out of this theory" (Cruise 2013). During the developmental stage of life, children under 5 years in age fully recognize that there are rules to communication, or grammar. Intuitively, they learn how to manipulate these rules in order to form coherent thoughts. This is not an occurrence endemic to one specific community; it is ever-present. Children of Chinese culture learn Mandarin at the same rate and with the same amount of ease that European children learn French, Italian, Russian, or Croatian. (Tronolone 2004). No matter where the child is on the planet, during the acquisition of the mother tongue, referred to as L1 or Primary Language, the rules of the language are picked up through assimilation and interaction with the ambient speech community.

The explanation for first language acquisition is relatively simple: while no human is the same externally, the basic structure and wiring for the brain is the same among all people. As a result of natural selection and evolution, all humans have developed a language processing center deep within the lobes of the brain. Although languages do not appear similar at the surface, they all share the same cognitive workings within the neural network. The brain is exposed to language during the critical development period, which is estimated to be from birth until age five although this is a common topic of discussion. Even if a child is born to native English speakers, the brain is not programmed for English. Rather, it is programmed to accept whatever input is readily available. (Tronolone 2004). If that child is raised in a French speaking area, French will be learned fluently. The inborn universal grammar will allow any language to be learned, and that ability is not culturally relative.

This theory of Universal Grammar is generally accepted among leading experts and linguists around the world, although it caused a massive stir within the linguistic community when it was first announced. A wealth of evidence supports its existence, even though no neuroscientific physical evidence has been found within the brain (Dubac 2013). What remains contested is the ability of adult learners of language. Second, third or fourth language acquisition at an older age continues to confound experts. It has spawned an international industry valued at $82 billion dollars with all sorts of methods purported to aid in language acquisition (Baer 2014). Scientists and amateurs alike concede that the ability to acquire additional languages as an adult becomes increasingly difficult as the brain finishes its development period around twenty years old.

However, the innate ability to process language, phonologically and grammatically, remains intact all throughout life (Bak 2014). The following is a review of the leading competing theories on how the adult mind most effectively learns multiple languages, apart from the L1.

The primary areas of inquiry is second, third, fourth etc. language acquisition at an older age. We will explore the most effective methods to successfully learn a new language as an adult, as well as the science behind language acquisition and how the brain processes it differently as a young child and as an adult.

Effective pedagogy for language acquisition:

It is quite difficult to choose the most effective method for teaching a second language. There are many competing theories and perspectives on which methods offer which specific benefits. For most adults, the emphasis is placed on acquiring language quickly, as it is often dependent on an upcoming international job placement or interaction with foreign countries and cultures. However, the fact that "individual differences are substantive and ubiquitous across language" makes standardization of language acquisition learning methods difficult (Bates 1988). The education process cannot be normalized as each individual learns in a different manner at various paces, making it almost impossible to pin point the most efficient method. On top of this, many adults attempt to learn their new language using study methods that are sub-optimal and many times counterproductive (Karpicke 2008). Despite this, a few available methods of language acquisition have been proven to be successful.

There are four primary orientations for second language methods and approaches. These orientations, according to linguist Jill Kerper Mora, are as follows:

Structural/Linguistic: Based on beliefs about the structure of language and descriptive or contrastive linguistics. This method Involves isolation of grammatical and syntactic elements of L2 taught either deductively or inductively in a predetermined sequence. It often involves much meta-linguistic content or learning about the language in order to learn the language. (Mora 2013)

Cognitive: Based on theories of learning applied specifically to second language learning. The focus is on the learning strategies that are compatible with the learners own style. L2 content is selected according to concepts and techniques that facilitate generalizations about the language, memorization and competence leading to performance (Mora 2013). As famed phycologist Edmond Huey notes in regard to reading, individuals "grow into it as they learned to talk, with no special instruction or purposed method, and usually such readers are our best and most natural readers." (Burke 1908). This is because of the cognitive and autonomous ability to select which material they interact with. What makes this orientation effective, is that the individual consumes and replicates only what interests them. Because the subject is fascinating and engaging, they are less consciously worried about the mistakes they might make. Rather, they gain an innate competence for the subject matter. Don Holdaway of McGill university adds that through this process, the learner gains "self-monitoring, predicting, structural, and imaginative operations, all essential strategies for handling written language both in context and context-free situations" (Holdaway 1973). The individual's autonomous selection and consumption of the material

allows for natural language development on the subconscious level. This initial memorization and regurgitation enables the development of an active and predictive language processing center influenced by the personal style and preferences of the learner.

Affective/Interpersonal: Focuses on the psychological and affective predispositions of the learner that enhance or inhibit learning. Emphasizes interaction among and between teacher and students and the atmosphere of the learning situation as well as students' motivation for learning. Based on concepts adapted from counseling and social psychology. (Mora 2013)

Functional/Communicative: Based on theories of language acquisition, often referred to as the natural approach, and on the use of language for communication. Encompasses multiple aspects of the communicative act, with language structures selected according to their utility in achieving a communicative purpose. Instruction is concerned with the input students receive, comprehension of the message of language and student involvement at their level of competence. (Mora 2013)

Evidently, there are a multitude of methods and approaches to effectively learn a second language and each individual may resonate with one over the other because of their personal interests, learning styles, or environment. For example, say someone is a visual learner, and must physically see a topic, equation or image written out in front of them. This individual would learn best with a cognitive language acquisition method that incorporates either writing out vocabulary words and phrases to see themselves, whereas say another individual who absorbs more by listening would prefer a communicative approach by hearing someone speak the language and participate in conversation. Some individuals also learn better in different environments, and it is their decision whether to choose a classroom setting, a self-taught approach or any other language acquisition method available to them.

While considering that each individual does have the power to choose a language acquisition method that caters to their interests, learning style and personal preferences, it has been noted by Rachel Mayberry that there is greater brain activity when a spoken language is stimulating the listener (Mayberry). This alludes to the fact that reading and writing to learn a second language, especially in adults, may be a less effective manner than conversationalist and communicative approaches. The actions of reading and writing do not stimulate the grammar area of the brain the same way speaking and listening do (Sakai). Performing such tasks also requires intense concentration and repetition in order to master. Physical manifestation, speaking, gesturing, and signing, are generally considered to be the primary faculties of human language and are what drive the learning process. The emphasized oral and listening skills that stimulate the brain are therefore of paramount importance during the process (Sakai). Yet, adults commonly choose books and written materials to learn a new language because it is perceived as the simplest way to self-teach as opposed to an oral communicative or cognitive approach. From the very inception, unless an adult language learner is immersed in the culture or exposed to a speech community of their target language, they begin the education process at a marked disadvantage.

Further looking into the act of communicating as a language acquisition method, child health analyst Frederick J. Zimmerman’s study on teaching by listening (2008) revealed that adult-child conversations are robustly associated with healthy language development. Parents should be

encouraged not merely to provide language input to their children through reading or storytelling, but also to engage their children in two sided conversations. To quote Dr. Jill Gilkerson, co-author of the UCLA Language Conversation Study, "Talk is powerful, but what's even more powerful is engaging a child in meaningful interactions – the 'give and take' that is so important to the social, emotional, and cognitive development of infants and toddlers" (Lowry 2009). Young children who cannot yet speak can still contribute to a conversation with actions and sounds, which is a critical step to their language development and future proficiency in a language. This act of interactive conversation not only benefits the children, but also the adults. Zimmerman's study acts to corroborate the results of the previously mentioned studies that reveal the importance of speaking and listening rather than simply reading and writing. The adult-child conversations are clearly mutually beneficial.

There has been a high interest in literacy and oral proficiency throughout the years. Linguist researchers Condelli and Wrigley found a strong relationship between oral proficiency (the ability to make sounds and sound sequences that form a language) and reading. Learners with higher oral skills showed more improvement in reading than learners with lower oral ability. (Condelli 2004). It would seem that some proficiency in oral skills is necessary for mastering basic reading skills, which corroborates Mayberry and Sakai's claims in their studies that conversation and oral skills should be of utmost priority. These findings suggest that teachers working with beginners would need to emphasize the development of oral skills before, or at least alongside, development of basic literacy skills for the most successful outcomes of language acquisition in adults.

A significant application of the common language acquisition methods that is catered to the adult community has been revolutionized by the emergence of the iPhone in 2007. Since then, a powerful movement of digital education development and language learning apps has become quite popular. Adults attempting to learn a second language have shown to choose such language apps because "the mix of different media and the varied ways in which information can be presented makes using apps for language learning much more appealing than traditional textbooks or... old-fashioned video and audio recordings, newspapers and dictionaries" (Rosell-Aguilar 2014). Humans are naturally inclined to want to try the new and latest trend, and with the current technology constantly improving, more and more smartphone users are turning to apps such as Duolingo or Busuu for their language acquisition needs and desires. A particular app called eStroke, used to study Chinese, has a primary purpose to "help in learning stroke order for writing Chinese characters, but it also includes an extensive dual-language dictionary, features excellent animations, and includes personal library and quizzing functions" (Godwin-Jones 2012). Such apps have truly developed to include a combination of listening, speaking, writing, translating and interacting in conversation, which caters to the vast preferences of individuals learning the language. These apps also seem to be more user-friendly because of the game-like features which increases user participation, and also the lack of exposure to others while learning the language as is present in a classroom setting. Because of this, the user is more comfortable making mistakes which is inevitable when learning a language, and therefore more inclined to try tasks many times over until they get it right.

However, the usage of apps does not necessarily greatly improve language retention. A 2003 study by J. Metcalfe of Columbia University shows that it is the amount of time you spend

studying that is more important than the method or interface that you use (Metcalfe, Kornell 2003). App usage greatly impacts the initial amount of time spent by learning a language, but without constant reminders, interaction with the app greatly tapers off as time or difficulty increases. Thus, the personal dedication of the learner is crucial in order to ensure effective learning during app-based auto-didacticism.

Age of acquisition:

An important question about the nature of language is the extent to which age restricts or constrains the acquisition. For years, there has been a common theory that in order to learn a language successfully it must be learned during childhood (Columbo, 1982). Many studies around the world have been performed to analyze this idea and to examine the critical period of language acquisition, which is also a subject of debate, and the correlation between the critical period and brain development. University of San Diego linguistic professor Rachel Mayberry's study takes a look at deaf and hearing individuals who were either taught to speak or sign any language in early age compared to deaf and hearing individuals who were not taught a language during early age. The results conclude that those with any sort of linguistic experience in early age contributes to better performance in learning a new language than if no linguistic experience was present in early childhood (Mayberry, Lock 2003). This indicates that the onset of language acquisition in early age dramatically alters and improves the capacity to learn any language later on in life, independent of the sensorimotor form of the early experience.

Similar to the study mentioned above, another significant research experiment was performed to look at the age of learning effect of children speaking mandarin and English. The results of the study showed that although learning a second language at a younger age is associated with more native-like fluency of the language, "the age of learning variable had a stronger impact on speech production than on grammar" (Huang 2013). This is very interesting, because the grammar is just as much a part of language fluency as speech production is, yet only the speech aspect was proven to be dependent on the age of acquisition in this particular study. Although learning grammar is supposedly easier to master if speech production is proficient, these results reveal some intriguing results regarding age of language acquisition.

The age of language acquisition clearly plays a significant role in mastering fluency in a language, but it also interestingly has the same effect on the acquisition or lack thereof of a foreign accent. It is proposed that "the nature of the human brain, not its nurture...is essentially involved- specifically, that the onset of cerebral dominance, which seems to occur around the age of twelve, inhibits the ability of a person to master the sound patterns of a second language without an impinging foreign accent" (Scovel). This is not saying that fluency cannot be achieved, but the accent is extremely difficult to fully master due to an adult's brain which has already developed fluency in a first language. The sounds and pronunciations which contribute to a native accent are engrained into an adult's brain after they reach the age of twelve, and trying to develop a completely different set of sounds and ways of saying certain words is extremely difficult, even more difficult than learning the language some say.

Language and brain structure:

The cortex, or brain's gray matter, plays a major role in cognitive functions such as language, memory, and thought. A thicker cortex may be induced by learning a second language in infancy due to the stimulation of new neural growth and connections that is demonstrated in the acquisition of other complex motor skills (Neuronet). Although children under five years old show the most drastic results with increased cortex from language acquisition, adults can still have similar neural growth, just at a different rate and gained through different methods. Denise Klein's study of bilingual and monolingual individuals showed that bilingualism has a direct correlation to increased cortical thickness and therefore enhanced memory and language use (Klein 2013). It can be deduced from this conclusion that language acquisition improves brain function because of the physical enhancement results it has on cortical thickness.

Brain plasticity refers to the brain's ability to change throughout life. Each time a new piece of knowledge is learned, new synapses and neural pathways are created in the brain, thus increasing brain plasticity. As a result, certain areas of the brain will have an increased physical size. For example, London taxi drivers have a larger hippocampus (in the posterior region) than London bus drivers (Maguire, Woollett, & Spiers, 2006). It is because this region of the hippocampus is specialized in acquiring and using complex spatial information in order to navigate efficiently. Taxi drivers have to navigate around London whereas bus drivers follow a limited set of routes (Michelon 2008). Being exposed to new ideas and learning new things increases the brain's gray matter and overall function because of the heightened neural pathways and synapses. Just as the taxi drivers reflect a larger physical brain size because of the knowledge they have acquired, an increase in the brain's physical size and function similarly occurs when a new language is learned.

Review:

As the literature suggests, it is an easier task to learn a new language for children developing in the critical period, or under about five years old. Because of increased brain plasticity, environment and natural desire to absorb new information, children have an easier time with languages than adults do, and this ease begins to decline from age six and older. However, this is not to say that adults cannot acquire a new language. There are many different methods that have been proven to help adults learn, and with new technology and variety of learning tools, adults have many resources to choose the manners that work best for them. It requires slightly more effort to dedicate time, energy and motivation to really focus on learning a language, especially with adults' hectic and busy lives, yet it is completely possible. The most prominent and effective method has shown to be interactive communication because it encourages the use of grammar, syntax, vocabulary and also forces speech, response, and listening, which all stimulate important areas of the brain. This has also been linked to successful language acquisition and native-like fluency.

Although there is a plethora of published research about language acquisition and age, it is still unknown what happens when a stroke or disease such as Alzheimer's affects an individual's language use or completely wipes out a person's knowledge of a language in older age. Further studies could be performed on this topic to examine the areas of the brain affected by the stroke

or dementia-related disease. There is a possibility that once that area and path is isolated, language can be re-routed or re-taught in a different manner to still enable effective communication once further research is performed. Moreover, since young children are very susceptible to learning new languages, it would be interesting to see if there is a limit as to how many languages can be learned during a child's peak development stage for learning languages. Starting such education early will definitely provide a benefit into adulthood, as supported by the literature.

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