

Abstract: The process of globalization and the associated strong increase in migration across countries have brought an increased interest in bilingualism, as parents and educators are eager to understand the implications of a bilingual upbringing on the child's development. A bilingual upbringing has potentially far reaching effects on a child's cognitive abilities as well as its ability to learn new languages due to an increased metalinguistic awareness.

This essay analyses the effect of bilingualism on vocabulary acquisition in a third language. To this end, the essay starts by reviewing bilingualism and its effects on cognitive ability and metalinguistic awareness, as well as the literature on language and vocabulary learning more generally. The main body of the essay is focused on recent empirical studies on the effect of bilingualism on third language vocabulary acquisition, and devotes special attention to factors that could influence the bilingual effect on vocabulary acquisition.

The results of the studies, for the most part, suggest a possible advantage bilinguals have over monolinguals in learning vocabulary in a new language. Despite the fact that bilinguals often maintain a smaller vocabulary size in each of their native languages and likely arises in part because of superior executive control. Other factors such as the ability to suppress the interference of their primary languages and a better phonological short-term memory. Finally, bilinguals appear to draw from both languages when making connection to a new word, supporting the notion that they derive an advantage simply from having access to more words in their primary languages compared to monolinguals who only have access to words in a single language. Overall, it appears that a mixture of the mentioned mechanisms drives the bilingual advantage when it comes to vocabulary learning in a third language, and future research is likely to yield more robust evidence on the exact mechanisms underlying a bilingual advantage.

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1. Introduction

Over the last century, research on bilingualism has increased a great deal. With the world getting smaller due to technological progress and easier access to other countries, people migrate more and engage in intercultural relationships, and as a result often raise children in a multicultural environment. This brings on an increased interest in bilingualism, as for example parents want to know if they are hindering their child's development by having them acquire multiple languages.

Early research found negative effects associated with bilingualism (Saer 1923; Saer et al. 1924), but there were major issues with the way these studies were conducted. With today's strict guidelines regarding controls for socioeconomic status, education and gender, however, studies are showing the opposite, namely that bilingualism has mostly beneficial cognitive effects (see e.g. Peal & Lambert, 1962; Kaushanskaya, 2012; Bialystok, 2008) as well as an overall positive impact on foreign language learning (see e.g. Marian & Spivey, 2003; Jessner, 1999; Papagno and Vallar, 1995), which will be explored further in this essay. Bilinguals are exposed to two languages for a substantial fraction of their lifetime and thus can draw from the experience of learning and practicing two languages when learning a third language. It thus may seem obvious that bilinguals have an advantage over monolinguals when it comes to language learning. When looking more deeply into specific areas of language learning, however, the advantage is not always as notable and may depend on the specific circumstances. For example in rapid lexical retrieval, where monolinguals outperform bilinguals as presented by Chen and Leung (1989) and in smaller vocabulary size as Bialystok (2001) found to be the case in children. These two disadvantages may also be related, as "it seems likely, that initial differences in vocabulary level will affect performance on lexical-based tasks" (Bialystok et al., 2008, p. 523). At the same time, the constant management of languages, teaches the bilingual a valuable skill in executive control where they tend to outperform the monolinguals (Bialystok et al., 2008).

The main focus of this essay is to analyze the differences and similarities between monolinguals and bilinguals in one specific aspect of language learning, namely in their ability to acquire vocabulary in a second respectively third language. I start by explaining bilingualism as well as foreign language and vocabulary acquisition

and then proceed to the core of the essay, which is to critically review the existing evidence of differences in vocabulary learning between mono- and bilinguals with special attention devoted to factors that could influence the bilingual effect and advantage on vocabulary acquisition.

To this purpose, chapter 2 introduces the general features of bilingualism, starting with defining what it is. As researchers are not in agreement on the best definition of the term it is appropriate to mention that being bilingual is a relative term, anywhere from being able to function in two languages to speaking two languages equally well and at native level. All do however, agree on the fact that a bilingual is not the same as two monolinguals. Furthermore, the chapter addresses the issues with numbering the languages in a bilingual's repertoire chronologically, and presents Hammarberg's (2010) method of categorizing the languages spoken by a bilingual. Namely, any languages learnt before the age of three are to be considered their L1. Lastly, chapter 2 reviews the cognitive and metalinguistic aspects of being bilingual. Specifically the advantages bilinguals have over monolinguals in those dimensions. Superior executive control and task management are most prominent in that respect as well as the bilinguals' ability to reflect upon their language use and usage and may develop learning strategies often different from their monolingual counterparts (Nation & McLaughlin, 1986). Then chapter 3 examines language and vocabulary learning especially. It reviews how many word families a person needs to know to get enough language coverage to function in said language. 6,000 to 9,000 well-chosen group of word families would suffice for a learner to understand 98% of a text, and even fewer for a very specialized or colloquial vocabulary. Moreover, the term of learning burden is introduced and explained how with knowing more than one language may lighten your learning burden making the burden on a bilingual often lighter than that of a monolingual. Finally, vocabulary learning methods are reviewed and explained. Receptive vocabulary vs. productive vocabulary as well as incidental vs. intentional learning. Receptive vocabulary will include words that we acquire by listening or reading. While productive vocabulary is used when we want to express a meaning through speaking or writing. Similarly, incidental vocabulary roughly translates to vocabulary that we unknowingly learn, whereas intentional vocabulary is deliberately learnt. In chapter 4 the focus is on vocabulary learning of bilinguals. Firstly the

difference between second language acquisition and third language acquisition is explained. Then possible mechanisms for the bilingual advantage are discussed such as exposure to different phonological systems (Kaushanskaya & Marian, 2009a), a greater memory storage as suggested by Papagno and Vallar (1995) and more efficient memory retrieval as presented by Bialystok et al. (2004). Finally empirical studies are reviewed that all in some way look at bilingual advantages and effects in novel word learning. Namely the effects of proficiency of the second language, the phonological or other differences between the two languages, the age of acquisition meaning are they simultaneous or sequential bilinguals as well as the type of words they are tested on, concrete or abstract. Vocabulary size which has been proven to be smaller in bilinguals than monolinguals (Michael & Gollan, 2005) is important when looking at lexical retrieval, Bialystok et al. (2008) investigated the lexical retrieval in context of vocabulary size, and found that with this control that the difference between monolinguals and bilinguals disappeared pointing to the vocabulary size being the reason for bilinguals disadvantage in lexical retrieval. Phonological short term memory is then explored, showing a stronger link between vocabulary and phonological short term memory in bilinguals than with monolinguals, suggesting an important role for memory capacity in retrieving vocabulary among bilinguals. Finally in chapter 5 the paper is discussed with comments and opinions.

2. Bilingualism

Before exploring how being bilingual and monolingual makes a difference when learning a new language, it is important to explain what it means to be bilingual. In general terms, being bilingual means speaking two languages equally well. There are many variations to this however, and thus it is difficult to make do with this simple definition. To be bilingual means different things to different people. Researchers have not been in agreement over the years on how to define bilingualism, where some maintain that a bilingual must be equally proficient in two languages even to the extent of a native speaker, where others claim that one must only be able to function in the two languages and where one language can be stronger than the other (Bloomfield, 1933; Grosjean, 1989). It can therefore be said that bilingualism is a relative term, where criteria and measurements are too vague to settle for one clear definition. What researchers have however realized lately is that being bilingual does not mean that you are a double monolingual, since they show characteristics such as code switching, the practice of alternating between two or more languages or varieties of language in conversation, which the monolinguals do not. Cummins (1991) referred to bilinguals as having ‘common underlying proficiency’ in contrast to two separate proficiencies in two languages. This is developed by the speaker as a kind of a linguistic bank which also contributes to an enhanced metalinguistic awareness.

Annick De Houwer explains in her book *Bilingual First Language Acquisition* that the term bilingual first language acquisition (BFLA) means “the development of language in young children who hear two languages spoken to them from birth. BFLA children are learning two first languages. There is no chronological difference between the two languages in terms of when the children started to hear them” (De Houwer, 2009) and because of this, De Houwer prefers to stay away from talking about first and second languages and rather refer to the languages of BFLA children as Language A and Language Alpha. Similarly, Hammarberg (2010) recognizes the problems with the linear model, which consists of numbering the languages chronologically according to when the speaker learned them: L1, L2, L3, L4, etc. Especially with multilinguals, it becomes very difficult to number their languages on a linear scale due to the simultaneous acquisition of multiple languages. Hammarberg thus suggested that

L1 (shall) refer to a language established up to a certain level in infancy, and L2 to any language encountered and acquired after infancy. The cutoff point when an L1 can be said to be established will have to be set by a chosen criterion, e.g., an age criterion such as 3 years as proposed by McLaughlin (1984; 10). A person can have one or more L1s and one or more L2s. (p. 94)

BFLA children defined according to De Houwer, therefore, have two L1s according to Hammarberg's definition of language acquisition. A person may also be bilingual if a second language was acquired after age three, i.e., has one L1 and one L2 language, but this would not meet De Houwer's definition of BLFA. In an attempt to strengthen his notion of only three different categories - L1, L2 and L3, Hammarberg adds to the explanations from Hufeisen (1998: 171-172) where she maintains that in L2 acquisition the speaker can profit from his prior knowledge of L1, but for L3

... the basis has been enriched by the knowledge and the experience from learning a non-native language and from specific L2 learning strategies developed in that connection. There is thus not only a scale of increasing complexity, but also a distinct qualitative difference between the conditions for acquiring the first, second and third language. However, when considering the acquisition of further languages beyond the third, these conditions are no longer radically different [...] [Furthermore,] In dealing with the linguistic situation of a multilingual, the term third language (L3) refers to a non-native language which is currently being used or acquired in a situation where the person already has knowledge of one or more L2s in addition to one or more L1s. (Hammarberg, 2010, p. 95)

This paper will use Hammarberg's notion of L1s L2s and L3s, and study any form of bilingualism, i.e. not necessarily be restricted to BFLAs.

2.1 The relationship between bilingualism and cognitive abilities

In 1962, Peal and Lambert set out to prove that monolinguals and bilinguals' score in nonverbal intelligence would not differ, but monolinguals would score higher on tests of

verbal intelligence. They considered many of the previous studies that had found monolinguals to be at an advantage, lacked in adequate controls such as the participant's education, socioeconomic status and gender and wanted to improve on that. Much to their surprise, the bilinguals scored higher in all aspects of the test. Moreover, they found that the bilingual advantage was in mental flexibility and that bilinguals actually profited from “language asset” as opposed to “language handicap” proposed by earlier researchers. Like many studies, theirs was not flawless, like the exclusion of unbalanced bilinguals in their selection process (Cenoz, 2003). The study is, however, considered groundbreaking and led the way for future researchers in the field, specifically regarding the use of better controls in studies on the effect of bilingualism. This paper by Peal and Lambert remains very important in the field of bilingualism. They showed that balanced bilinguals performed substantially better than monolinguals on verbal and nonverbal intelligence tests respectively, and additionally proposed that the bilinguals have “a language asset, are more facile at concept formation and have a greater mental flexibility” (Peal & Lambert, 1962, p. 22) which would explain this general intellectual advantage.

In more recent years, research has confirmed Peal and Lambert’s findings and refined their analysis. For example, it was shown that, when a bilingual person uses one language the other language is active at the same time. So when the bilingual hears a word, before that word is completed, the brain is already looking for a match, and starts guessing from its pool of known words what word the person is about to hear. This is not limited to a single language, this auditory input is activated regardless of which language the word belongs to (Marian & Spivey, 2003, Tanenhaus et al., 1995). The fact that both languages are active at the same time, may therefore point to an advantage in cognitive abilities over monolinguals who do not have to learn to manage multiple languages.

Some recent research also found some negative aspects of bilingualism. In particular, having to deal with constant linguistic competition can also be confusing and result in language difficulties, like naming pictures slower than monolinguals (Gollan, Montoya, Fennema-Notestine, & Morris, 2005), producing fewer words than monolinguals on verbal fluency tests (Gollan, Montoya & Werner, 2002), longer reaction times and more tip-of-the-tongue episodes (Gollan & Acenas, 2004) and

weaker verbal skills in both languages. At the same time, this constant management of languages, teaches the bilingual a valuable skill in controlling how much language to access, and thus the brain needs to balance these two languages and uses for that a system of cognitive abilities every time they speak or listen. Ultimately, the difficulty and challenge set by learning and speaking two languages from an early age on, is to sharpen and improve the cognitive abilities associated with executive control. The superior executive control of bilinguals results in better task management where they outperform monolinguals on tests such as the Stroop test, which measures a person's ability to manage conflicts in tasks (Prior & MacWhinney, 2010). In this test, people see a written word and they then have to say the color of the font this particular word is written in. When the color of the word and the written word match (i.e. the word "red" in a red colored font), people give faster responses than when they don't match (i.e. the word "red" in green colored font). It is, however, in those conflicting circumstances that bilinguals outperform monolinguals, since they have gotten accustomed to ignoring competing information. The same is true for switching between tasks, when a person has to stop sorting by color for example and start sorting by shape, bilinguals tend to do so more rapidly (Prior & MacWhinney, 2010; Tannenhaus et. al, 1995). Overall, this evidence shows that, generally, there is a positive effect of being bilingual on cognitive abilities such as for example executive control and task management.

2.2 Metalinguistic awareness

One specific cognitive factor that is particularly relevant for language learning and where bilinguals may have a distinct advantage over monolinguals is metalinguistic awareness and thus I explore this in detail here. Metalinguistic awareness is widely considered a major component when it comes to the cognitive aspects of language learning. Metalinguistic awareness can be defined as the ability to understand, and reflect upon, how language works. Bilinguals will therefore, because of their communicative needs, switch between languages and reflect upon their language use and usage and compare and develop strategies often different from their monolingual counterparts (Nation & McLaughlin, 1986). This awareness is considered a "key component in the cognitive aspect involved in language learning, more so in third language acquisition (TLA) than second language acquisition (SLA), as speeding up of

the language-learning process can be expected with increased learning experiences” (Jessner, 1999, p. 203). Learning two or more languages can therefore result in one having higher metalinguistic awareness. However, research has shown that the proficiency in both languages for the bilingual has to be significant (Cummins, 1979) and the languages have to be considered prestigious within the speech community in question (Lambert, 1977) for the metalinguistic awareness to improve.

In an experiment carried out by Jessner (1999), adult bilinguals (Italian/German) learning English at University were recorded when thinking aloud while writing an academic letter, a summary and an essay. Data from this study provide evidence of metalinguistic thinking involving all three languages. The subjects were recorded language switching between German, English and Italian, which would then give proof to the fact “that learner language is characterized by strategic skills which are developed in order to compensate for the lack of knowledge” (Jessner, 1999, p. 205). We can take for instance the search for similarities between the languages, which would support metalinguistic thinking and furthermore prove the creations of links between the linguistic systems L1, L2 and L3, which form part of the person’s psycholinguistic systems. This would then point to Cummins’ (1991) ‘common underlying proficiency’, or in other words, to increased metalinguistic awareness.

It must also be noted that the data presented in the study, of the usages of all three languages, only represented about 0.5% of samples of language mixing. Most of the time the student would use only two languages, their primary language, based on their own language dominance of either German or Italian and English (Jessner, 1999).

To conclude, an advantage bilinguals have over monolinguals is in the aspects of cognitive and metalinguistic abilities. Specifically superior executive control and task management, as well as their ability to reflect upon their language use and usage and which may help them develop learning strategies often different from their monolingual counterparts.

3. Language and vocabulary learning

No one knows all the words in a language and it is even difficult to find out how many words there are in a specific language because the way to count words is problematic. E.g., is a word in its singular form the same word as is in its plural form? Is a word that has more than one meaning, one or multiple words? One way to count words in a language is to use a large and well established dictionary, for instance the *Webster's Third New International Dictionary* in the case of English, which contains around 54,000 base word families excluding proper names (Nation, 2013). Learning all those words is beyond the capabilities of most people, even for their native language. It is hard to establish completely how many words a native speaker of a language knows. Goulden, Nation, and Read, (1990) and Zechmeister et al. (1995) suggest that an educated adult knows around 20,000 word families while Biemiller and Slonim (2001) suggest that from the age of three up to 25 years old a person will add up to 1000 word families a year.

Therefore, it is a non-realistic goal for a foreigner to aim to reach native speaker proficiency. Moreover, the vocabulary size of natives varies greatly and thus there is a question to what type of native speaker one should compare non-native speakers when assessing their vocabulary knowledge (Nation, 2013). So the question is rather, how many words a person needs to know to be able to function in a foreign language. If one counts all words as having equal value a learner must learn many words to be able to function in the language he or she is learning. However, there is a big difference between the value of words and so called high-frequency words are of much more use to a learner. Knowing a well-chosen group of 6,000 to 9,000 word families would suffice for a learner to understand 98% of a text, and in a very specialized vocabulary, a learner can get away with knowing even fewer word families, if he focuses solely on the vocabulary that is particularly important in that field. Additionally, colloquial spoken language only requires around 3,000 word families to reach 95% of coverage (Nation, 2013).

The amount of effort that goes into learning a word is called a learning burden (Nation, 2013), the more effort that goes into it, the heavier the learning burden. For this reason, knowledge of another language, be it L1 or L2, is helpful when learning a new language and if the word

... uses sounds that are in the first language, follows regular spelling patterns, is a loanword in the first language with roughly the same meaning and fits into roughly similar grammatical patterns as in the first language with similar collocations and constraints, then the learning burden will be very light. [...] [In addition,] de Groot (2006) presents evidence which shows that learning burden affects learning. L2 words that most closely resembled L1 spelling patterns were easier to learn and were less likely to be forgotten. (Nation, 2013, p.45)

To summarize, a learner of a new language does not need to know the same amount of words as a native speaker of said language to understand or be understood by others. Depending on the type of vocabulary one wishes to learn somewhere between 3000-9000 word families would suffice. Additionally, being bilingual might make your learning burden lighter, namely if your two known languages bear similarities to the novel language and or words. The ways in which bilinguals learn vocabulary is explored in the following section.

3.1 Types of vocabulary learning

Bilinguals may learn vocabulary differently than monolinguals and thus it is important to understand more generally the different types of vocabulary learning. Vocabulary and vocabulary learning can be divided into receptive and productive vocabulary and learning respectively. Receptive carries the idea that we are receiving information as opposed to producing it. Thus, receptive vocabulary will include words that we acquire by listening or reading. While productive vocabulary is used when we want to express a meaning through speaking or writing. Although this terminology is better suited than the distinction between passive and active learning, it still carries in it the assumption that while receiving a knowledge we are not actively doing anything, when in fact we are producing meaning of that word that we just received (Nation, 2013). It is possible to view reception and production as being on a continuum, as proposed in *Learning Vocabulary in Another Language* (Nation, 2013), yet Meara (1990) suggests a further distinction. Whereas productive vocabulary is activated by other words but receptive must be activated through external stimuli like hearing or seeing. In addition, Corson

(1995, pp. 44-5) maintains that receptive vocabulary “includes the productive vocabulary and three other kinds of vocabulary - words that are only partly known, low-frequency words not readily available for use, and words that are avoided in productive use” (as cited in Nation, 2013, p. 47). The distinction between receptive and productive vocabulary is important and has received a considerable attention in the study of L2 learning.

Webb (2008) improved on past studies that had researched the size of the receptive and the productive vocabulary in L2 learners, by recognizing that earlier studies did not control for the fact that in a receptive vocabulary test the participants had the option of guessing, which is not a possibility in a productive vocabulary test. Even though Webb’s results did not go against previous results in that a person’s receptive vocabulary is larger than his or her productive, his findings were that the difference was not as big as previous studies indicated. Especially for EFL (English as a foreign language) learners, who learn most their L2 through explicit learning, the difference in receptive and productive vocabulary size was not as great as the difference is for an L1 speaker, who would have learned their language mostly implicitly, whereas the ESL/EFL learner primarily learns words for productive use in the beginning.

Another way of categorizing vocabulary learning is to distinguish between incidental and intentional learning. Incidental and intentional learning is often used interchangeably with implicit and explicit learning and roughly their meaning is as follows: intentional/explicit refers to learning a vocabulary by deliberately remembering their spelling, form and sound for example in a classroom setting. While incidental/implicit learning means you unknowingly or at least unintentionally learn a word’s meaning while engaging in listening or reading and by immersion rather than in a classroom. Rather than seeing these different ways of learning vocabulary as opposing, one should look at them as complementary, each one enhancing the learning that comes from the other.

Williams & Chung (2011) found through a series of experiments that when learning a L2 or L3 vocabulary, if a word’s meaning is context-independent the learner makes a connection to his L1. Which could support intentional vocabulary learning like a classroom setting, where word to word translations are a common method of vocabulary learning. In contrast, meanings that depend on context such as collocates,

which usually need to be learned by experience with the L2 or L3 and does not transfer from the L1. Pointing to incidental learning. Therefore, learning vocabulary is best done with balance between incidental and intentional learning (Nation, 2013). Similarly, the learning burden would prove lighter for the bilingual over the monolingual, since they can utilize these both methods explained.

When learning a new language, a fraction of known word families is needed to get close to full language coverage. A bilingual has the ability to build on known words or linguistic aspects of language because of their metalinguistic awareness, and thus making their learning burden lighter. Specifically over a monolingual whose metalinguistic awareness is neither as strong nor do they have the additional language to build on. Furthermore, for a bilingual to have the option of learning their languages both intentionally and incidentally, gives them the balance that results in a lighter learning burden. The third language vocabulary learning of bilinguals is examined in the following chapter.

4. Third language Vocabulary acquisition of bilinguals

Given how relatively recently researchers started to merge together the fields of bilingualism and second and third language acquisition, it is impossible to generalize about the effects of bilingualism on third language acquisition. There are too many variables when studying this effect and not sufficient amount of studies have been carried out researching the exact same question while controlling for all the relevant variables. Before reviewing studies to this effect it is important explain what Third language acquisition (TLA) is and how it differs or relates to Second language acquisition (SLA).

TLA must not be considered a variant of SLA. Although it shares some characteristics such as the fact that in both cases the learner is acquiring a non-native language, it must be noted that the acquisition of a third language differs from the acquisition of a second language because of prior language learning experience. Having two or more languages in their linguistic repertoire which they can in turn use to relate “new structures, new vocabulary or new ways of expressing communicative functions to the two languages they already know” (Cenoz, 2013, p.73) helps the learner in the development of language strategies that often differ from the strategies of an inexperienced learner of a second language. And as a result can lead to the speeding up of the language learning process (Jessner, 1999). This experience also means that the learner, because of his experience with learning another language, will have developed skills and strategies during his acquisition that he can then in turn transfer over to the learning of the third language. Cenoz (2013) compared this experience to going from walking (L1) to learning how to drive a car (L2) to then learning how to drive a bus (L3). Meaning that even though learning how to drive a car and a bus are quite different actions, you can still transfer some of your knowledge from learning how to drive a car to when you learn how to drive the bus, and you can build on this knowledge, rather than starting from complete zero as is the case from walking to driving a car or knowing one language to learning another. This must be particularly true for bilinguals who are exposed to more than one language for a substantial amount of time.

Several different mechanisms contribute to the advantage the bilinguals have over monolinguals in second/third language acquisition as will be discussed in the following section.

4.1 Possible mechanisms of bilingual advantage in vocabulary learning

The goal of this essay is to not only study the factors that drive the bilingual advantage, but also to review the different mechanisms that may lead to a bilingual advantage and relate these particular mechanisms to the findings in the studies analyzed in the section further below. Before reviewing the studies on the bilingual advantage, I thus describe here the mechanisms that underlie a possible bilingual advantage in acquisition of vocabulary learning, which are manifold.

First, early exposure to different phonological systems which in turn “might delay the onset of language-specific phonological tuning (e.g., Bosch & Sebastián-Gallés, 2001) and more tolerant phonological system that persists into adulthood may make bilinguals especially well equipped for encoding unfamiliar phonological information” (Kaushanskaya & Marian, 2009a, p.709). Second, memory storage is another possible mechanism for advantage, in the respect of bilinguals’ memory storage is greater than that of monolinguals as suggested by Papagno and Vallar (1995) who additionally proposed that bilinguals have higher working memory capacity¹. “Linking word-learning advantages to working memory is logical, given that prior work has indicated an association between word-learning and working-memory performance (e.g. Gupta, 2003; Papagno, Valentine, & Baddeley, 1991; Service, 1992)” (Kaushanskaya & Marian, 2009a). Third, the more efficient retrieval of memory is yet another possible reason for a bilingual advantage. As Bialystok et al. (2004) aptly described, “bilingual language processing is characterized by habitual suppression of words from one language in order to select words from the target language.” Word-learning performance may rely on such inhibitory mechanisms.

Finally, one can also distinguish between the scaffolding model and the accumulation model in novel word learning, where the scaffolding model predicts

... that the ability to create a direct association between a newly encountered word and an existing word or concept drives memory strength. Novice learners rely heavily on L1 translations during L2 vocabulary learning (Liao, 2006; Schmitt, 1997), which anchors the relatively weak novel word to a strong existing memory. (Bartolotti & Marian, 2017, p. 114)

¹The cognitive system that allows for temporary storage and manipulation of information.

The keyword learning method where one makes a connection between a novel word and a known word based on a link they come up with between the two words (Shapiro & Waters, 2005) would fall under the scaffolding method. *The accumulation model* relies more on lexicon-wide patterns. Meaning that certain sounds or letter combinations are more predictable when drawing on the learner's existing vocabulary, and thus are easier to maintain and repeat. This is different from the "one-to-one whole-word associations that drive learning in the scaffolding model; this memory for a word as the sum of its parts is the key to the accumulation account of vocabulary acquisition" (Bartolotti & Marian, 2017, p. 115). This is an important mechanism in word learning of bilinguals especially, as will be explained in chapter 4.2.5.

To sum, mechanisms such as early exposure to different phonological systems, higher working memory capacity and more efficient memory retrieval and suppression, are all possible factors explaining bilingual advantage over monolinguals in TLA and SLA respectively. The following section examines studies that support these possible mechanisms.

4.2 Empirical studies on the effects of bilingualism on vocabulary learning

In this section I look closely at and compare a number of studies that I found to be most closely related to the topic of this thesis. All of these studies look into the effect, and advantages specifically, that being bilingual has on third language vocabulary learning. These studies devote special attention to factors that could influence the bilingual advantage, such as the proficiency of the second language, the phonological or other differences between the two languages, the age of acquisition, meaning are they simultaneous² or sequential³ bilinguals and the types of words they test them on, namely concrete or abstract words and vocabulary size of the participant to name a few. I will address these issues in terms of bilingualism before discussing the third language effect.

4.2.1 The similarity between the bilinguals' languages

To what extent do the similarities between known languages matter when learning a

² When you learn languages at the same time.

³ When you learn languages not at the same time but where one follows the other.

third language? Similarly, is the relatedness, or the lack thereof, between the L1s and L2 a factor when learning the L2? These issues are reviewed in this chapter.

One of the first studies that specifically analyzed the bilingual advantage in vocabulary learning was Papagno and Vallar (1995), who compared monolinguals and multilinguals who acquired their second and third languages respectively in the classroom. The study established a clear advantage of the multilinguals in terms of the phonological short-term memory and the ability to learn new words in a foreign language. Subsequently, other studies confirmed the bi- or multilingual advantage in vocabulary learning. For example, Kaushanskaya and Marian (2009a) found that there is an advantage of early bilingual exposure for novel word learning in a natural setting, as opposed to the classic classroom setting as researched by Papagno and Vallar. Papagno and Vallar (1995) researched bilinguals whose two languages were related and shared an alphabet, and therefore it is impossible to know whether the advantage that they found bilinguals had over monolinguals was conditional on the fact that the bilinguals' two languages were related or not. In an effort to expand on Papagno and Vallar's research, Kaushanskaya and Marian (2009a) divided their participants into groups of English monolinguals, English-Spanish bilinguals and English-Mandarin bilinguals who all had learned their two languages in early childhood. The main goal of the study was thus to see if the bilingual advantage depends on the similarity of the two languages in terms of phonology and orthography.

An artificial phonological system was designed to be equally familiar and unfamiliar to all participants and would overlap with all three languages at a similar degree. The participants then learned the novel words by hearing them and seeing with the English translation at a pace they themselves controlled. The results showed that there was indeed a bilingual advantage with both bilingual groups outperforming the monolingual group both in overall performance and in long-term maintenance. There was, however, no significant difference between the two bilingual groups. And with the novel words not overlapping with the bilinguals' second languages, it is possible to deduce the fact that their advantage has to do with the early exposure to two different linguistic systems rather than this particular overlap.

Kaushanskaya and Marian's study also did a digit-span test, which is a test where you must remember the order of random numbers. The digit span task exercises

your verbal working memory. They did this to test the participants' phonological memory, and it turned out that both bilingual groups performed similarly to the monolingual group, but outperformed them in the word learning task, therefore making it possible to conclude that the advantage cannot be the result of a better phonological memory, but rather due to more efficient encoding and retrieval of the new vocabulary. Their study found an obvious advantage of bilinguals over monolinguals while learning novel words, and the advantage was present for both groups of bilinguals and thus not affected by the similarity between the two languages. Exactly why or how may not be as clear however, and the mixture of mechanisms mentioned in section 4.1 may well be the reason for why bilinguals, regardless of their languages' relatedness or lack thereof, outperform monolinguals in novel word learning tasks.

Even though Kaushanskaya and Marian's study shows that the advantage is rather the effect of early exposure to two different linguistic systems rather than an overlap of languages, I think that one cannot completely discount the relatedness of languages as an important advantage in vocabulary acquisition if the third language shares common features with one of the bilinguals' languages. Even though I could not find any studies that look at this specifically in terms of vocabulary learning, the following study still gives some insight into the matter. In a study where English monolinguals and English-Spanish bilingual immigrants were compared when learning French, the bilinguals obtained significantly higher scores than the monolinguals in spite of being immigrants, which most studies have shown them not having an advantage over non-immigrant monolinguals (Cenoz, 2003). This result has to be explained by the closeness of the two languages, Spanish and French.

4.2.2 Vocabulary size and executive control⁴

As opposed to bilinguals outperforming monolinguals in novel word learning as presented in the study by Kaushanskaya and Marian (2009a) in previous chapter, it has been found that when it comes to task assessing aspects of linguistic processing, it is the monolinguals who outperform the bilinguals (Michael & Gollan, 2005), particularly in

⁴is a set of processes that all have to do with managing oneself and one's resources in order to achieve a goal. This executive control emerges late in development and declines early in aging, and includes activities such as high level thought, multi-tasking, and sustained attention (Bialystok et al., 2005).

rapid lexical retrieval, as it takes longer to produce words in a second language than a word in first or stronger language (Chen & Leung, 1989), and here it does not make a difference if you are a high performing bilingual responding in your stronger language or not, a monolingual will outperform you. The inability to inhibit interference from the other language (Herman, Bongaerts, de Bot, & Schreuder, 1998) could be a reason for this disadvantage, although this is in stark contrast to several other studies that show that bilingualism is positively associated with ability to limit interference, see Sections 4.2.3 and 4.2.4. It is also possible that “each language system in a bilingual is supported by “weaker links” connecting the concept to the word than is the single language of a monolingual (Gollan & Acenas, 2004)” (as cited in Bialystok et al., 2008, p. 523). Another reason could be a smaller vocabulary size in each language as Bialystok (2001) found to be the case in children. These two disadvantages, lexical retrieval and lower vocabulary scores may also be related, as “it seems likely, that initial differences in vocabulary level will affect performance on lexical-based tasks” (Bialystok et al., 2008, p. 523). What most studies did not do, however, was to account for a smaller vocabulary size in bilinguals during the lexical tasks, as well as ignoring the fact that given the time they need, bilinguals will perform on par with monolinguals during lexical decision tasks, as found by Randsell and Fischler (1987). There they tested monolinguals and bilinguals on episodic recognition, lexical decision, object naming, and free recall. They found no difference between the two groups regarding accuracy only speed, where the bilinguals were slower in list recognition and lexical decision.

Bialystok et al. (2008), however, investigated the lexical retrieval in context of vocabulary size and executive control. 24 monolinguals and 24 bilinguals of various languages took part in several tasks such as spatial span tasks, PPVT-III test which is a receptive vocabulary test, Modified Boston naming test⁵ and letter and category fluency⁶. The results showed that during a forward span, which “is a simple measure of short-term spatial recall” (p. 529) the monolinguals scored higher. On the backward span, which requires “executive control to hold the items in mind and perform the recursion operation” (p. 529), the bilinguals, however, outperformed the monolinguals,

⁵ line drawings with detailed definitions are presented to participants who are asked to name the drawing.

⁶ a test where a person must say as many words in a given category within a specific timeframe.

reaffirming that bilinguals have an advantage when it comes to executive control or working memory. When the vocabulary was not controlled for, bilinguals performed worse than the monolinguals in all verbal tasks, however, once the vocabulary was controlled, the difference disappeared, which makes one draw the conclusion that the vocabulary size is the reason for the bilingual disadvantage as opposed to the retrieval. Category fluency⁷ did now show monolingual advantage, rather no difference, however during two tests of letter fluency⁸, where a second test was carried out putting the bilinguals in subgroups as well as having a bigger pool of participants and a more executive control demanding task, there were differences. In the first study monolinguals produced more words than bilinguals, but in the second one high performance bilinguals outperformed the monolinguals.

What these studies tell us is that in both of their languages, “bilinguals often maintain a vocabulary that is smaller than that of a comparable monolingual, and this fact may reduce the efficiency of lexical retrieval” (Bialystok et al., 2007 p. 535). Why that is has yet to be determined although Bialystok et al., suggest that “reduced lexical processing efficiency is reflected in both smaller vocabulary size and in weaker links between lexical representations and overt naming, as suggested by Gollan and colleagues (e.g., Gollan et al., 2005)” (Bialystok et al., 2008, p. 535). Therefore, concluding that bilinguals balance their vocabulary shortcomings against their advantage in executive control is realistic, and that the fluency depends both “on the verbal proficiency level of the participant and on the executive demands of the task.” (Bialystok et al., 2008, p. 536). Meaning that where bilinguals lack, such as in vocabulary size, they make up for with their executive control and task management.

4.2.3 Interference from the primary language(s) in foreign vocabulary acquisition

Interference from L1 has been proven to affect the acquiring of a novel word when the words are matching in orthography but not in phonology. This is only in the case of monolinguals however as found by Kaushanskaya and Marian (2009c). In a study related to the question of interference, Kaushanskaya and Marian (2009b) examined the

⁷ a test where a person must say as many words in a given category within a specific timeframe

⁸ a test where a person must name as many words that start with a particular letter within a specific timeframe

effect of bilingualism on adults' "ability to resolve cross-linguistic inconsistencies in orthography-to-phonology mappings during novel word learning" (2009b, p. 829). Once a person has learned how to read, the letters and sounds become permanently linked to the language they learned how to read in, usually their L1. Both the words' visual shape when reading and the auditory signal when hearing become activated (e.g., Lovemann, van Hoff, & Gale, 2002). Since the previous studies have shown that bilingualism does facilitate word learning, Kaushanskaya and Marian study's goal was to see whether experience with two languages that differ in phonology but not orthography interfere with novel word learning. English-Spanish bilinguals and English monolingual adults took part in the experiment.. They learned an artificial language which contained four neither English nor Spanish phonemes along with four English phonemes. Their results replicate previous studies in that the bilinguals' advantage was found facilitating novel word learning, as well as indicated "that experience with Spanish reduces interference effects associated with L1 letter-to-phoneme mappings" (Kaushanskaya and Marian, 2009b, p. 832). In addition, the results showed that during hearing and seeing the words the advantage was more reliable, suggesting that learning words bimodally is more effective for bilinguals, a condition that proved to be particularly difficult for monolinguals as it hindered the word's retention, meaning that it interfered with the phonological encoding in monolinguals but not bilinguals. A possibility for this is that the two linguistic systems that the bilinguals are required to learn shield them from this interference, but could also be because both the novel language and Spanish have transparent orthography, meaning that each letter has only one sound as opposed to English which the monolinguals only spoke. The bilinguals may therefore have developed a mechanism of suppression, which allows them to selectively inhibit the letter-phoneme mapping between languages. To summarize, when learning a third language the bilinguals may use a suppression method to stop interference from their two languages, a method acquired from a being aquatinted with two linguistic systems. Giving them an advantage in vocabulary learning over the monolinguals who neither have the ability to suppress interference nor the experience of dealing with two linguistic systems.

4.2.4 Phonological short-term memory⁹ and vocabulary retrieval

With the established consensus that exposure to more than one language can affect the vocabulary skill of a bilingual, it had yet to be researched if the same effects were found in simultaneous bilinguals as in sequential bilinguals, which is the topic of the study by Kaushanskaya, Blumenfel and Marian (2011). The authors of this study administered standardized test of vocabulary knowledge to monolinguals and bilinguals and contrasted the monolinguals' performance with the performance of both simultaneous bilinguals and sequential bilinguals. Additionally, they wanted to test a particular mechanism of bilingual advantage, namely whether performance differences among these groups could be attributed to differences in "phonological short-term memory capacity" (Kaushanskaya et al., 2011 p.409).

In this study, the authors used the PPVT-III test to compare the group of monolinguals to sequential and simultaneous bilinguals, both groups of bilinguals being English-Spanish.

The findings of the study were in line with predictions, mainly no difference in the PPVT-III score between monolinguals and bilinguals, but there was a stronger link between receptive vocabulary and phonological short-term memory in bilinguals when compared to monolinguals. In addition, a further analyses indicated that even among bilinguals, there was a strong association between vocabulary knowledge and phonological short-term memory. As to the explanation of these findings, it is possible that these two groups use different cognitive abilities to get to their level of receptive vocabulary knowledge with the bilinguals relying on phonological short-term memory while the monolinguals don't.

In the second experiment where they tested the sequential bilinguals vs. monolinguals, the results revealed the same conclusion as in with the simultaneous bilinguals, making it possible to generalize to a wide range of bilinguals. Moreover, when dividing the group of bilinguals into high-digit-span¹⁰ and low-digit-span¹¹ subgroups, with that being the only variable in which they differed, the authors found

⁹ refers to one's ability to remember linguistic information for a brief period of time (e.g. Baddeley, 1986)

¹⁰ When one scores high on the digit span test, meaning that your verbal working memory is above average.

¹¹ When one scores low on the digit span test, meaning that your verbal working memory is below average.

that the low-span group relied more on phonological memory capacity for the performance on the vocabulary test.

In conclusion, this study suggests an important role for memory capacity in retrieving vocabulary among bilinguals. I think these findings may have important implications for the ability of acquiring the vocabulary in another language, as monolinguals may not be used to using phonological short-term memory to encode and retrieve unknown words in a new and unfamiliar language, whereas bilinguals may have acquired this ability through the continuous reliance on phonological short-term memory to make up for the less readily available lexical representation of their primary languages. Thus providing an advantage for bilinguals in foreign vocabulary learning.

4.2.5 The scaffolding vs. the accumulation model of vocabulary acquisition

Looking only at how bilinguals learn novel vocabulary an empirical study was carried out by Bartolotti and Marian (2017), where 20 English-German bilinguals were taught an artificial language that bore similarities with both languages. The main goal was to find which methods the bilinguals used, namely scaffolding and accumulation methods. And with that knowledge, an assumption can be made of whether bilinguals are at an advantage over monolinguals in vocabulary learning. The new language, was made up by making the words adhere to the lexical patterns of English and German as well as words that did not resemble either language's lexical patterns, them being mainly neighborhood size, meaning how many words of the native and novel language differ in only one letter and orthotactic probability which is the calculation of how often letter sequences or single letters appear in a language. In this study they compared two possible models for how being bilingual affects novel vocabulary learning, the before mentioned scaffolding and accumulation models respectively. If participants learn the novel word better if it overlapped with both previous languages that would point to the accumulation method. In contrary to there being no advantage in the learning of the novel word if it overlapped with one or both as in the scaffolding method.

A majority of the learners reported having used a known word as an intermediary for the new one, creating a link between the spelling of the new word to a connection between a known similarly spelled word and meaning of the new word. This supports the use of the keyword strategy which, as previously mentioned, falls under the

scaffolding model. Moreover, the words that were made up with patterns from both English and German, did not show to be easier or quicker to learn than those whose pattern was from only either language. In addition, L3 words that resembled either English or German proved to be easier to remember than those that had no similar lexical patterns as their L1 languages.

So given these findings, namely that multilinguals will draw from two or all languages to make the connection to a new word, simply by using whichever language it resembles more lexically, we can deduce that their pool of known words is up to twice the size of the one of monolinguals, given them a clear advantage to vocabulary learning.

It is, however, worth mentioning that where this study falls short is in the type of words that were made up to be learned. They were all high frequency and easily imaginable objects, making the keyword method an obvious method for learning. The effects that the concreteness of the words has is discussed further in the following chapter. We can therefore not be certain by which method the participants would learn the novice language best when counting in abstract concepts. This particular factor is reviewed in the following section.

4.2.6 Concreteness of the word¹²

When learning novel vocabulary, the type of word you are learning is of an importance. Specifically whether the novel word is an abstract word or a concrete word, since research has shown that concrete words are easier to remember (Kaushanskaya & Rechtziegel, 2012). Thus, Kaushanskaya and Rechtziegel (2012) “manipulated the concreteness of the referent in the word-learning paradigm, since concrete words have been shown to activate the semantic system more robustly than abstract words do [...] to examine whether bilinguals are more sensitive to the semantic information associated with the novel words” (p. 935). In a previous study carried out in 2012 the same authors had discovered that apart from the general advantage that bilinguals had over monolinguals, the types of errors that the two groups made became of interest (see Kaushanskaya & Rechtziegel, 2016). By coding the errors into two categories, sound

¹²The word’s meaning is available to the senses, meaning we can see, hear, touch smell or taste it. And therefore its meaning is quite stable.

and meaning based, they found that bilinguals made fewer meaning based errors than the monolinguals, which they in return interpreted that given the same task parameters, that “bilinguals may be able to encode novel words more deeply (i.e. to the semantic level) than do monolinguals” (Kaushanskaya & Rechtziegel, 2012 p. 936). For this reason they “contrasted the learning of the new words in association with concrete versus abstract referents” (Kaushanskaya & Rechtziegel, 2012 p. 936). When a bilingual is presented with a concrete word it makes sense that it activates a wider lexical-semantic network because of their two languages, however, with the abstract words the overlapping between languages is not as clear and therefore the advantage that the bilinguals might have over the monolinguals is not as apparent.

Two lists of 12 words from a nonword database (Gupta et al., 2004) which they paired with an English translation, one list with concrete and the other abstract translations, were presented to English monolinguals and English-Spanish bilinguals who then had to learn the words. The results showed that the “difference between the concrete and abstract words in the bilingual group were twice the size of the difference in the monolingual group” (Kaushanskaya & Rechtziegel, 2012, p. 939). This could be accounted for in the before mentioned wider lexical-semantic network, as the translation of the words into English may have activated the Spanish network for the bilinguals, suggesting that a sensitivity to semantic information is a general ability in bilinguals.

In conclusion, an advantage is stronger for concrete than abstract novel words which is correlated with the bilinguals’ wider semantic network. A system that is more robustly activated in response to rich material, like the concreteness of a word, than the monolinguals’ system producing stronger effects and better retentions in bilinguals as opposed to monolinguals.

To summarize, there are different mechanisms that contribute to the advantages that bilinguals have over monolinguals during novel vocabulary learning. Including the early exposure to different phonological systems, a greater memory storage and a more effective retrieval of memory than that of monolinguals. The better executive control that bilinguals have been proven to have over monolinguals, relates to that as Bialystok et al. (2008) found where bilinguals make up for what they lack in vocabulary size with executive control. The suppression of interference from other known languages for example, which they have learnt from the experience of dealing with two languages.

The usage of phonological short term memory is another advantage that the bilinguals have over monolinguals, where in the acquisition of a vocabulary in a new language the phonological short term memory is of great importance for encoding and retrieving unknown words. Additionally, in respect to concrete words, which have been shown to be easier to remember, learn and retrieve, bilinguals as well as monolinguals tend to use the scaffolding model when learning new words. Giving bilinguals, again, an advantage over the monolinguals because of their repertoire of words which can be up to twice the size of monolinguals' repertoire.

5. Discussion and conclusion

The results of the studies discussed in the previous section, for the most part, confirm the advantage bilinguals have over monolinguals in learning vocabulary in a new language. Studies have been quite consistent in the past showing an advantage in general aspects of proficiency, more so than in specific aspects, but since in this paper I focused on vocabulary learning I will only reflect upon findings regarding vocabulary learning. Despite its shortcomings, the study carried out by Papagno and Vallar in 1995 set the tone for many of the studies I reviewed for this paper, mainly in the analyzation of where the apparent advantage bilinguals have over monolinguals in vocabulary learning comes from. The study of Kaushanskaya and Marian (2009a) that wanted to directly improve the study of Papagno and Vallar looked at early bilinguals and how their different language histories influenced their ability to learn novel vocabulary and found that the advantage that bilinguals have over the monolinguals cannot be attributed to the overlap of the novel language and their second language (Spanish and Mandarin) but rather their experience with different linguistic systems. Since they found that all the bilinguals had an advantage over the monolinguals they did not attribute that advantage to that the type of the second language. Even though the English-Mandarin advantage was noticeable over the monolinguals and therefore cannot be accounted for by the similarity of languages, I think that an advantage of similarities cannot be completely discounted, as we saw in the studies of German and Romansch bilinguals learning French and English and English-Spanish bilinguals learning French. A way to figure out if the relatedness to the third language that is to be acquired, is to contrast the bilingual advantage of bilinguals whose one language is of the same language family as the third language, to bilinguals whose neither languages share a language family with the third language, for example German/Polish bilinguals to German/French bilinguals learning Spanish.

Bialystok et al. (2008) mentioned in their paper that a reason for the disadvantage that they found for lexical retrieval in bilinguals, mainly when looking at the speed of acquisition, was possibly because of their inability to inhibit interference from their other languages. This was suggested by Hermans, Bongaerts, de Bot, and Schreuder in 1998. However, this conclusion does not match the results of studies made by Kaushanskaya and Marian (2009b) and Kaushanskaya et al. (2011), and Bialystok et

al. don't seem to put too much value on that being the reason for why bilinguals come up short in these studies. Instead, they focus on the vocabulary size as well as removing the time constraints put on during these retrieval tests, and finds that when those two things are controlled for the disadvantage of the bilinguals disappears and even shows an advantage when it comes to executive control during lexical retrieval. What Kaushanskaya and Marian (2009b) found, however, was that the interference of the L1 has on novel word learning was only found in monolinguals and that when learning a language with the same orthography but different phonology, bilinguals benefited from their two languages rather than it hindering their learning. As their knowledge of Spanish, in this case, helped since the novel language resembled Spanish in the aspect that both languages had transparent orthography. It is possible that this ability that stops the interference is a key component in why bilinguals outperformed monolinguals in novel word learning in the first study reviewed in this chapter. In other words, rather than having to stop the interference, the bilinguals simply look for similarities with either language facilitated by their knowledge of two linguistic systems and once a connection is made to either language the mechanism of suppression will suppress one language giving the bilingual an uninterrupted access to the other language. Although, I have not found any studies researching that, it might make for a good research topic.

Kaushanskaya et al. (2011) found that bilinguals, regardless of what kind, simultaneous, sequential, high digit span or low digit span, all relied on phonological short-term memory during vocabulary retrieval of receptive vocabulary whereas monolinguals did not, and attributed that to less accessible English lexical representation in the bilinguals. Their score did however not differ, only the method in which they used in order to get to the answer. What interested me in particular in this paper was the fact that low- and high digit span bilinguals relied on their phonological short term memory to different extents, mainly with the fact that low span bilinguals, relied on it more than high span. With the conclusion that memory capacity plays an important role in retrieving vocabulary for bilinguals, this in turn could be one of the reasons for why bilinguals learn a new vocabulary better than monolinguals, who are not used to using this particular memory to encode and retrieve unknown words. I also wonder if comparing low and high span bilinguals when learning novel vocabulary, whether the low span participants could outperform the high span bilinguals, simply

because of their greater need for the reliance on the phonological short-term memory.

With all these studies that appear to be in agreement that bilinguals are at an advantage when learning a novel vocabulary, researchers have become interested in how they use their advantages. One of such studies compared two possible models of how they learn the novel words, the scaffolding and accumulation models and found that most bilinguals used an already known word as an anchor for the novel word and created a link between them proving the usage of the scaffolding model. Making it so that bilinguals have up to twice the amount of words to link to as opposed to the monolinguals, given that their vocabulary size in their L1 is comparable. This did not, however, factor in words that are abstract and therefore more difficult to link to known words, and as Kaushanskaya and Reetziegel (2012) found while manipulating the concreteness of the words. By reviewing the errors bilinguals made and comparing to the monolinguals, they came to the conclusion that bilinguals encoded words down to semantic level, which the monolinguals did not. Thus, it may be the sensitivity to the semantic information during learning concrete words that activates a bigger lexical-semantic system, because of their two languages, rather than a different learning mechanism.

To conclude, given the recent attention this aspect of bilingualism and second/third language learning has received, I believe a lot of strive has been made. Not only to disprove former beliefs that being bilingual is disadvantageous if not detrimental to a person's development, but also to show that often the opposite proves to be true. An overall advantage, in cognition especially, has been established, and only when looking closely into specific areas of bilingualism will you find aspects where bilinguals are at a disadvantage. In this thesis, I only focused on novel vocabulary learning and found an overwhelming consensus of a bilingual advantage, however, not all agree on where this advantage comes from. Be it memory, word retrieval methods, extended lexical-semantic system, the relativity of known language to each other as well as to the third language, language history, suppression of one language to access the other or executive control. It is very clear to me that a mixture or collaboration of before mentioned mechanisms is what makes it so that bilinguals are at an advantage when it comes to vocabulary learning, but will, however, not be surprised if in the future both more mechanisms and more robust mechanisms will be discovered because of how

young this field of research is. An interesting and related topic for future research would be to assess whether bilinguals would benefit from a more tailored approach in novel language learning that takes into full consideration the particular way in which they learn vocabulary and other aspects of the language.

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