Articles

Theory and Practice of Second Language Acquisition
vol. 5 (2) 2019, pp. 11–23
10.31261/tapsla.7554

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The Bilingual Advantage and the Language Background Bias

Abstract

The idea that bilingualism can give us an advantage in life is of great interest to the scientific community, due to its significant positive implications for healthcare and education. In recent years, several scholars have provided evidence in favour of the so-called *bilingual advantage or benefit*, which suggests a positive association between bilingualism and cognitive development. In order to understand whether the claim is fully warranted, this paper examines the evidence in support and against the existence of the possible bilingual benefit for individuals. Following a brief discussion on the use of the terms bilingualism and multilingualism in the literature, this paper aims to provide a summary of the possible advantages and disadvantages currently associated with prior language knowledge in the mind, highlighting some of the possible reasons for the different results that have been reported. In addition, this paper proposes that there are inconsistent experimental results due to a *language background bias*, which refers to the widespread failure to classify prior language background in a consistent and suitable manner in empirical research. The paper ends with some suggestions for future research that can help us move forward and increase our understanding of the bi-/multilingual advantage as a broader phenomenon.

Keywords: multilingualism, bilingualism, bilingual benefit, cognitive development

Introduction

The bilingual advantage or benefit refers to the range of benefits speakers of two languages seem to display when they go through the process of language learning or when they carry out tasks that are cognitively demanding and/or require a great deal of attention. The idea that bilingualism can give us an advantage in life is naturally of great interest to the scientific community

due to the significant positive implications for both healthcare and education. In recent years, the existence of an advantage for bilingual and multilingual speakers has been widely debated in academic papers as well as in newspapers, television, and social media.

As a result of these activities, there is now a much broader awareness of the importance of language learning for children from a very young age and all the way through life. Learning a language early in life is believed to be a great achievement and an added value in itself. While it has become more common for people to link bilingualism with some type of benefit for the individual, several questions have simultaneously been raised. As a result, there is now some disagreement about the extent to which bilinguals and multilinguals can be argued to be truly blessed with the long list of advantages that is attributed to them. The primary aim of this paper is to examine these issues more closely.

This paper begins with a brief discussion of the inconsistent use of the terms bilingualism and multilingualism in the literature and why more clarity is relevant for our understanding of the bilingual benefit as a general phenomenon. Then a summary of the evidence of advantages and disadvantages that are associated with prior language knowledge in the mind will be covered, which will highlight some of the possible reasons for the different results reported in the literature and will introduce the language background bias in empirical research. This paper will then conclude with some suggestions for future research that can help researchers and learners move forward and increase their understanding of the bi-/multilingual advantage as a broader phenomenon.

Bilingualism and Multilingualism: A Terminological Concern

In recent years we have seen the growing trend of using the term *multilingualism* to refer to both bilingual (two languages) and multilingual speakers (more than two languages). Within areas on societal multilingualism such a broad use might make sense, but the same cannot be said about research on individual multilingualism, as additional accuracy is typically required. The topic of the present paper—the possible effects of prior language knowledge on learning—is a good example of how important this distinction can be for research on individual multilingualism.

In order to examine the association between the languages acquired and the benefits arising from having become bilingual or multilingual, it is imperative that we make explicit reference to the number of languages an individual is familiar with. The presence of two languages in the mind, as opposed to three

or four, the different proficiency levels achieved in these languages, and the frequency of use in daily life may well make a difference for the individual are indeed argued by some authors who claim the increase in benefits to be dependent upon the number of languages known (Perquin et al., 2013). Therefore, a lack of distinction between bilinguals and multilinguals makes it virtually impossible for us to ask specific questions about the amount of language knowledge stored in the mind and its influence on cognitive development. For these reasons, the terms bilingual and bilingualism within this paper are strictly used to refer to speakers of two languages and phenomena associated with two languages, while multilingual and multilingualism are used to refer to speakers of three or more languages and phenomena associated with a minimum of three languages in the mind.

Review of the Literature

Our current understanding of the advantages and disadvantages associated with prior language knowledge and cognitive development remains quite limited to date for two main reasons. Firstly, the literature is largely based on studies that compared monolingual with bilingual speakers, therefore claims about multilingual speakers are often hypothetical rather than empirically-based. Secondly, research has mostly focused on Executive Function (EF)—a relatively narrow field of enquiry which investigates the cognitive processes that allow us to make a decision, reach a goal, obtain information, make plans, and so forth. These processes are typically examined in controlled laboratory settings.

In the literature, we find a long list of studies on the advantages associated with prior language knowledge and EF, but there are other studies which show disadvantages or no advantages at all. These positions are reviewed in the next two sections below.

Advantages

The core claim that we find in the literature is that bilingualism improves Executive Function (EF), therefore there is a set of cognitive processes that help us carry out a number of different tasks in our daily lives. Under the umbrella term of EF, we find studies on the processes that control what we pay attention to and how we suppress irrelevant information. EF also includes research on

the speed at which we switch between concepts, notions, and ideas, and there are other studies on the amount of information we can hold in our minds for short periods of time (working memory). Some of these functions are believed to be used simultaneously when we carry out complex cognitive tasks such as planning, reasoning or problem-solving.

Over the years bilingual speakers have been argued to show a number of different type of advantages in relation to EF (for a good review, see Adesope et al., 2010). Some of these include advantages in relation to information inhibition and attentional control (Bialystok et. al, 2004; Carslon & Meltsoff, 2008; Martin-Rhee & Bialystok, 2008), the ability to switch between different sets of information (Bialystok, 1999; Bialystok & Martin, 2004), improved working memory (Carslon & Meltsoff, 2008) visual processing and perception (Chabal, Schroeder, & Marian, 2015; Wimmer & Marx, 2014), phonological awareness (Bialystok, Majumder, & Martin, 2003) and stuttering (Kornisch et al., 2017).

Age is often under scrutiny as learning patterns naturally change as we grow, and benefits are believed to start early in life and last during our lifetime (Bialystok et al. 2004; Carlson & Meltzoff, 2008; Clare et al., 2016; Filippi et al., 2015, Fischer & Schweizer, 2014; Kazemeini & Fadardi, 2016; Gold, Johnson, & Powell, 2013; Gollan et al. 2011; Lazaruk, 2007; Mårtensson et al., 2012). While most studies examine behaviour at a single-point in time, some researchers are instead focusing on changes over time. An example is Ansaldo et al. (2015) who compared bilinguals' control abilities taking age into account. The authors found that older bilinguals and monolinguals seem to display a similar level of interference, but they also seem to achieve control using different neural substrates, suggesting more profound neural changes as we grow.

The positive influence of bilingualism has been further associated with Alzheimer's and dementia (Gollan et al., 2011). While we know that bilingualism does not prevent the illness, it seems to delay the onset of its symptoms of about four to five years (Alladi et al., 2017; Bialystok et al., 2007), which is a significant amount of time for those affected. Advantages are further argued to apply to those who are literate as well as illiterate in one of the languages, suggesting that education alone may not be a sufficient explanation for bilinguals' performance (Alladi et al., 2017).

Among the factors of interest to applied linguists and educators are language proficiency and language distance, as these factors are typically associated with differences in monolingual and bilingual behaviour and have implication for language acquisition and language development. Moreover, multilingual speakers frequently have different proficiency levels in their non-native languages, which creates a pressing need for researchers to understand the following: when the benefit might start, under what conditions, and how benefits may adjust to rapidly fluctuating proficiency levels. The bilingual advantage has been argued to grow as bilingual proficiency grows, as shown for instance in a study on

the increase of translation equivalents over a 7-month period (Crivello et al., 2016). The benefit has also been linked to advantages in language learning as well as mathematical learning in multilinguals (Dahm & De Angelis, 2017), and the advantages seem to arise even when there is minimal language distance between the two languages known to the speaker (Antoniou et al., 2016).

A recurrent explanation for the bilingual benefit (see Bialystok et al., 2004) is that bilinguals develop an increased ability to deal with conflict and distractions because of the frequent switching between their languages. The switching experience is argued to improve their ability to complete tasks associated with EF, to increase their ability to keep languages apart and to help them develop better working memories for storage and processing.

Most of the studies mentioned above focus on specific cognitive processes associated with EF, and the specificity of these processes is such that it is sometimes difficult for us to fully extrapolate the potential implications for language learning or other types of learning. Future applied research may give us additional insights on the relevance of these benefits for learning as a broader cognitive activity.

Disadvantages or No Advantages

Kenneth Paap and his colleagues are major advocates of the view that there are no bilingual advantages that can be associated with EF. The researchers attempted a replication of Bialystok et al. (2004) study which originally compared monolinguals (English L1) and bilinguals (Tamil-English) using the Simon task, but they were unable to obtain similar results. To investigate the matter further, the authors carried out a number of other experiments, but the evidence found did not provide additional support for the existence of a bilingual advantage (Paap & Greenberg, 2013). Paap, Johnson, and Sawi (2015) further claim that 80% of the tests carried out after 2011 show null results or are based on small samples, and discuss the need to introduce more rigour in terms of processes, procedures, and analysis, while advocating the use of bigger samples. Similar arguments appear in von Bastian, Souza, and Gade (2016), who also believe early effects may be task-specific and confined to small samples.

An area that requires further research relates to the role of proficiency and degree of bilingualism in EF. As is commonly known, language knowledge is not something that individuals either have or do not have, plenty exists in between, and studies that group participants according to language background are already showing the importance of these factors for EF. Gathercole et al. (2014), for instance, tested several measures of EF on balanced bilinguals and

monolinguals in Wales and found that there was an occasional advantage for those dominant in the language being tested rather than for bilinguals. Their results call for increased attention towards proficiency levels and the need to monitor language background more thoroughly. Similar suggestions appear in Kousaie et al. (2014) who recommend that future researchers move forward by focusing on the differences between language groups.

Other studies conclude that the bilingual advantage does not exist or it is restricted to very specific conditions and circumstances (Arizimendi et al., 2018; Dunabeitia et al., 2014; Papageorgiou et al., 2018). Some of these studies claim an advantage for monolinguals (Folke et al., 2016). Bilinguals have additionally been shown to have more difficulties than monolinguals when accessing low-frequency words (Runnqvist et al., 2013), and it is a well-known fact that ease of retrieval is linked to language proficiency and frequency of lexical access.

While the evidence against the existence of a bilingual advantage is beginning to grow, firm conclusions remain premature at this stage. In the literature, there is a general call for results to be interpreted with more caution (Goldsmith & Morton, 2018; Hartsuiker, 2015, Klein, 2015; Morton, 2010; Paap, Johnson, & Sawi, 2016). Some scholars even go as far as dismissing the existence of the benefit in its entirety, labelling it as a sheer myth and describing it as an "insufferable mixture of excessive claims and weak evidence" (Morton, 2014, p. 929).

Why So Many Conflicting Results?

The literature shows evidence that is both in favour and against the existence of a bilingual advantage for cognitive development and several explanations have been discussed to explain the inconsistencies. This section reviewed current explanations and argued for the existence of a bias that is too frequently overlooked in empirical research: the language background bias.

Publication Bias

De Bruin et al. (2015) present arguments which emphasise how only studies with positive results tend to be published while those with negative or no results are more likely to remain unpublished. The authors maintain that this difference generates a publication bias which creates a false impression of the overall significance of the published results. To test the hypothesis, the authors monitored 13 years of conference abstracts on the bilingual benefit and EF (from 1999 to 2012) and checked how many of those studies were ultimately published. Those with positive results were indeed published the most, while

those with negative or no results were published the least, and they argued that this difference did not have anything to do with sample size or test type.

Immigration Bias

Fuller-Thomson and Kuh (2014) have put forward the argument that bilinguals taking part in EF research are usually immigrants who should be regarded as a self-selected group, as those who migrate to build a new life for themselves are usually the most motivated and the most intelligent individuals. While this explanation might be plausible in some contexts with large concentrations of recent immigrants, it is very difficult to extend to most bilingual and multilingual contexts around the world where multilingualism is the result of different ethnicities sharing the same space for a long time. Perquin et al. (2013), for instance, found evidence in favour of the bilingual benefit in a study on dementia and the aging population of Luxembourg, a context where the multilingualism of its inhabitants has been the norm for decades and cannot be considered the result of recent immigration. The literature also presents the opposite argument, that there is a recurrent association between immigration and disadvantages in education as children with an immigrant background are typically linked to poor performance in school (Miller & Warren, 2011).

Language Background Bias

I believe in the existence of another type of subject-selection bias which is largely underestimated that can have a major impact on overall results: the *language background bias*.

The language background bias relates to the widespread failure to classify prior language background in a consistent and suitable manner in empirical research (see also De Angelis, 2017). Scholars typically assume that low proficiency background languages do not play a major role in bringing about benefits for the individual and accordingly classify participants on the basis of their "fluent" languages. Most people, however, have knowledge of other languages in addition to their mother tongue and are not "fluent" in all of their languages.

Forming groups that are not homogenous in terms of language background introduces a significant bias in empirical research. If fluency is the core criterion for subject selection, one can easily understand how true monolinguals may be grouped together with those who have knowledge of non-native languages but are not fully fluent in those languages. All participants would be labelled as "monolinguals" even though some of them might be bilingual or even multilingual. We already have evidence that even a few years of exposure

to a non-native language can influence the acquisition of subsequent languages (Bardel & Lindqvist, 2007; De Angelis, 2007, 2018; Rast, 2010) which is further reason for us to exercise some caution when embracing methodological practices that might be convenient but are not fully reliable. A great deal of research on the bilingual benefit comes from Canada and the work of Ellen Bialystok, for instance, and while bilingual fluency is not widespread, one does wonder how many monolingual Canadians can be found in a bilingual country where every adult is likely to have been exposed to either English or French as a second language in school. The same can be said about many other contexts around the world. For example, most young adults in the US will have studied some Spanish as a foreign language in school, and in most European countries foreign languages are typically introduced in primary school. Nowadays, true monolinguals are in fact difficult to locate, particularly in non-English speaking contexts.

The studies published over the past few decades did not use common subject selection criteria, and decisions for subject inclusion were typically informed by subjective beliefs about the amount of prior language knowledge that makes, or does not make, a difference in performance. Conflicting findings are often associated with inconsistent methodological practices, and if we consider the small amount of information usually available on subjects' prior language background in the published literature, the likelihood that a language background bias was introduced in many of the studies' designs is quite strong.

There are probably a number of other competing reasons that can help researchers explain discrepancies in the results. First, generalizations from past research may have been far too ambitious for the current level of understanding of the phenomenon and perhaps more caution would have been in order. Second, from a methodological perspective researchers have been comparing results from studies that used different types of tasks and, as just mentioned, whose participants' language backgrounds have been classified in an inconsistent manner. These two facts alone are a good recipe for inconsistencies to emerge. Participants have typically been grouped according to a broad set of different criteria, including origin, education, SES, immigrant status and cultural background. Benefits may well arise from a combination of different factors, and it is quite possible that bilingualism is only one of them rather than the only factor involved. Further research is required to evaluate this possibility and examine additional variables in isolation.

Looking Ahead

The purpose of this paper was to evaluate how feasible it is for researchers to claim the existence of a bilingual benefit for cognitive development on the

basis of our current understanding of the subject matter. The paper reviewed several studies that provided evidence in support as well as against the existence of a bilingual benefit, highlighting a number of methodological and procedural concerns which suggest that considerably more work needs to be done in order to clarify the matter in the future. On the whole, some caution must be taken as the research progresses.

If this debate about the benefits of bilingualism is to be moved forward in a meaningful way, then it is advisable to conduct large-scale studies, preferably longitudinal, that make use of similar or comparable batteries of tests, perhaps across different labs and different locations. In order to avoid incurring in the language background bias, participants also need to be classified by paying more attention to all the languages they speak, not just the ones in which they are fluent. There is simply no point for researchers continue to compare bilinguals with monolinguals, if the so-called monolinguals have knowledge of other languages as well, or the bilinguals are perhaps multilinguals. Bilinguals and multilinguals speak different languages at different proficiency levels and make use of their languages in different contexts and for different purposes, and the creation of fictitious categories that do not take into account the participant's actual background knowledge does not help researchers advance in any way. How can we claim that language knowledge provides an array of benefits if we do not even take that very knowledge into account in a systematic manner? Discrepancies arise when the same phenomenon is assessed using different criteria and different methodologies. In my view only additional methodological rigour will provide more clarity on the phenomenon and will allow us to identify the potential application of the benefit for bilingual and multilingual adults and children in healthcare and educational settings.

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Überlegenheit zweisprachiger Personen und sprachlich bedingte Einschränkungen

Zusammenfassung

Die Ansicht, dass die Zweisprachigkeit uns einen Lebensvorteil verschaffen kann, stößt bei Forschern auf sehr großes Interesse, weil sich daraus sehr positive Implikationen ergeben, die im Gesundheits- und Bildungswesen ausgenutzt werden können. In den letzten Jahren verwiesen zahlreiche Studien auf die Beweise, die von der so genannten Überlegenheit zweisprachiger Personen zeugen, und auf die Vorteile, die aus der Zweisprachigkeit resultieren. Dies lässt auf einen Zusammenhang zwischen der Zweisprachigkeit und der kognitiven Entwicklung schließen. Um besser zu verstehen, ob sich diese Behauptung in der Praxis bewährt, sollten in diesem Beitrag solche Argumente untersucht werden, die für und gegen die Überlegenheit der Zweisprachigkeit bei einzelnen Personen sprechen. Nach einer kurzen Diskussion über die Verwendung der in der Literatur präsenten Begriffe der Zweisprachigkeit und Mehrsprachigkeit fasst der Beitrag die Belege für die Vor- und Nachteile zusammen, die

derzeit mit dem Vorhandensein des früheren Sprachwissens im Kopf verbunden sind, wobei mögliche Gründe für Diskrepanzen in den Forschungsergebnissen herausgestellt und sprachbezogene Einschränkungen diskutiert werden. Der Beitrag wird mit Hinweisen für weitere Forschungen abgeschlossen, die unser Verständnis für solch ein umfassendes Phänomen wie die Überlegenheit einer zweisprachigen Person vertiefen und verbessern können.

Schlüsselwörter: Mehrsprachigkeit, Zweisprachigkeit, sich aus der Zweisprachigkeit ergebende Überlegenheit, kognitive Entwicklung