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Bilingualism and the development of metacognitive abilities -Metacognitive awareness as an analytical approach-

Mohammed Abbou¹, Ghizlane Merzaq² and Abdelhak El Bakouri³

¹PhD student, specialising in psychology, Faculty of Arts and Humanities, Mohammed I University, Oujda, Maroc.

²Research professor, Faculty of Arts and Humanities, Mohammed I University, Oujda, Maroc.

³Abdelhak El Bakouri, research professor, Faculty of Arts and Humanities, Mohammed I University, Oujda, Maroc.

Abstract-The effects of bilingualism extend beyond the linguistic-communicative aspect to include broader cognitive and metacognitive aspects. Although contemporary studies tend to emphasise the cognitive advantages enjoyed by bilinguals and to assert that bilingualism is a stimulating environment for the development of cognitive abilities, these advantages may depend on the nature of the bilingualism and the individual's level of linguistic competence. From this perspective, this research is concerned with revealing the effect of bilingualism on metacognitive abilities, with a focus on metalinguistic awareness. Possessing two different language systems enables individuals to consciously control language and reflect on its characteristics, including analysing the structure of words and sentences and using language flexibly in different contexts, which is the essence of metalinguistic awareness. However, the extent to which bilinguals benefit from these metacognitive advantages depends on the nature of the bilingual influence. Therefore, this article will address the question of the extent to which metalinguistic awareness is affected by different patterns of bilingualism. Through this research, we have concluded that the influence of bilingualism on metacognitive abilities, particularly metacognitive awareness, is neither general nor constant, but rather depends on the pattern of bilingualism and

the nature of its influence, which ranges from positive to negative.

Keywords: cognitive development, metacognition, metalinguistic awareness, bilingualism, linguistic competence.

Introduction

The concept of language refers to a system of symbols and signs used to exchange ideas and feelings among members of a linguistic community (Oviogun, 2020). Although the communicative function is the most prominent and present feature of language, its impact extends to cognitive development (Ianco-Worrall, 1972; Weil, 2012). cognitive abilities (Carruthers, 2002; Rabaglia & Salthouse, 2010; Perlovsky, 2009) and metacognitive abilities (Idris et al., 2022; Villanueva, 2022; Sun & Zhang, 2023). This means that there is a relationship between language and cognition, in that language is a cognitive structure that influences an individual's cognitive processes. Piaget & Inhelder (1969) showed that linguistic development is necessarily accompanied by growth and transformation in cognitive structure. This enables the

individual to move from a level of simple (sensory) cognitive processing to abstract cognitive processing, where the individual can employ complex cognitive processes to interact with their environment.

The influence of language on cognition is enhanced when an individual possesses two different linguistic systems, i.e. when they are bilingual. To test this hypothesis, numerous studies have been conducted on the cognitive effects of having two different language systems, with the aim of revealing the extent to which bilingualism affects cognitive development and cognitive processes (Cummins 1984). The results of these studies varied to the point of contradiction. Some (especially early research) showed that bilingualism had a negative cognitive effect on the individual (Saer, 1923), i.e. it constituted an additional burden on the individual and caused mental and cognitive fatigue. Others, however, emphasised its positive impact and role in cognitive processes and executive functions (Peal & Lambert, 1968). As a result, these studies will occupy their place in cognitive science in general, and cognitive psychology in particular. Researchers will be interested in uncovering the relationship between bilingualism and cognition.

The impact of bilingualism is not limited to simple cognitive processes, but extends to the metacognitive abilities of the individual (Bialystok, 2001; Jessner 2018; Maghsudi & Talebi, 2009). Among the most important of these abilities is metacognitive awareness, which is particularly important in the relationship between bilingualism and metacognition, as it combines the two variables in a single word. The term "metacognitive" is part of the term "metacognition" coined by Flavell, who defined it as awareness of cognitive abilities and strategies, along with the ability to organise, monitor and control cognitive processes. (Flavell, 1979). According to this definition, metacognitive activity, i.e., conscious and reflective cognitive activity, is conditioned by metaregulation, metacognition, metacognition, and metamemory. The concept of consciousness refers to an individual's awareness of themselves and their external world and is linked to their subjective experience (Dienes, 2025). Thus, metalinguistic awareness, as the ability to focus attention on language as an independent system and to reflect on and evaluate it (Bialystok, 2001), is a metacognitive ability that enables the individual to make language the subject of thought and observation. Metalinguistic awareness allows the child to consciously analyse the structure of language itself. In other words, these children do not merely acquire and speak language, but analyse and observe it as if they were linguistic researchers.

If metacognition is knowledge about knowledge (Papaleontiou-Louca, 2003). That is, it is a mental activity that involves thinking about, being aware of, organising and monitoring cognitive processes. Metacognitive awareness is one of the sub-dimensions of metacognition and falls within it as a conscious linguistic ability that is part of cognitive awareness. Since this ability (metalinguistic awareness) is subject to cognitive growth and development, it is influenced by several factors, such as executive functions (Zhao et al., 2025), age (Edwards & Kirkpatrick, 1999), and education (Melogno et al., 2022). However, the variable of bilingualism has attracted the attention of researchers in recent decades (), who have focused on studying the role and relationship of a child's or individual's possession of two different language systems on their metalinguistic awareness and its growth and development (Altman et al., 2018; Bialystok, 1987, 1988, 2001; Cummins, 1978; Festi & Vender, 2024; Torregrossa et al., 2022).

It should be noted that most of these studies focused on revealing the relationship between metalinguistic awareness and bilingualism in general, without scrutinising and examining the types of bilingualism. As is well known, based on the classification provided by Butler & Hakuta (2004), there are several types of bilingualism, the most important of which are host bilingualism, subsumptive bilingualism, sequential bilingualism, simultaneous bilingualism, dominant bilingualism, balanced bilingualism, early bilingualism, late bilingualism, and others. Given that the impact of bilingualism on cognition varies according to its types and levels (Ricciardelli, 1992), metacognitive awareness, as part of metacognitive activity, is also affected by patterns of bilingualism (Altman et al., 2018; Bialystok, 1988). Hence, this paper discusses the effects of types of bilingualism on metacognitive awareness, which can be classified as positive or negative depending on the type of bilingualism. In doing so, we will attempt to answer the following questions:

- Does bilingualism affect metalinguistic awareness?
- Does the effect of bilingualism on an individual's metalinguistic awareness differ depending on the type of bilingualism?
- To what extent can it be said that some bilinguals benefit from cognitive and metacognitive advantages, while other bilinguals do not benefit from such advantages ?

Linguistic competence and types of bilingualism, the problem of classification and cognitive dimensions

The process of defining types of bilingualism requires answering the question: who is bilingual? To answer this

question, it is necessary to define criteria that enable us to distinguish between monolinguals and bilinguals on the one hand, and between different types of bilingualism on the other. So how can bilingualism be defined? What criteria should be adopted in this regard? Does a bilingual person combine two monolingual persons? In other words, can a bilingual person master the second language L2 as well as native speakers do?

Early researchers in the field of bilingualism were interested in describing bilingualism. Accordingly, their research was based on a strict criterion that requires a bilingual person to have two separate and simultaneous linguistic competences. This type of bilingualism is referred to as perfect bilingualism. It is a person who is equally proficient and fluent in two languages (Grosjean, 2008, p. 10). This means that, strictly speaking, a bilingual person is someone who is perfectly proficient in their mother tongue and perfectly proficient in their second language. For example, in the case of a Moroccan bilingual (Arabic-French), based on the above criteria, they must be as proficient in their first language (Moroccan Arabic) as Moroccans are, and they must speak French as well as the French do. Therefore, anyone who does not meet these conditions is not considered bilingual (Arabic-French).

This criterion has been criticised for not taking into account the existence of different types of bilingualism, and because the studies that use it adopt measures that are unsuitable for assessing linguistic competence and skills in both languages, or adopt measures that apply to monolinguals (Grosjean, 2008 ; Myers-Scotton, 2006). If we are talking, for example, about a Moroccan bilingual (Arabic-French), the tests that will be applied to him in both languages will be the same as those applied to the first monolingual (Moroccan Arabic) and the second monolingual (French). If we want to test the language proficiency of a French person who speaks French, we will use a measure that tests the individual's proficiency in French, and the same applies to Arabic. As for bilinguals (Arabic-French), both measures will be applied to them, as if they were Arabic-Moroccan and French at the same time. In other words, it is as if they are two monolingual people in one person.

To define the types of bilingualism, we can refer to a number of different classifications, but the most important and prominent of these classifications is that presented by Hamers & Blanc (1989) in their work entitled: "Bilinguality and Bilingualism" and that presented by Butler & Hakuta (2004) in their work: "Bilingualism and Second Language Acquisition". Here, we will rely on the classification presented by Butler & Hakuta (2004):

Table (1): Types of bilingualism according to classification criteria.

Classificati on criterion	Type of bilingualism	Characteristics
Relationsh ip between proficiency in both languages	1) Balanced bilingualism. 2) Dominant bilingualism.	1) Achieving an equal level of proficiency in both languages. 2) Differences in proficiency in the two languages.
Organisati on of linguistic symbols and units of meaning	3) Complex bilingualism. 4) Coordinated bilingualism. 5) Dependent bilingualism.	3) A linguistic system shared by both languages (a single system of meaning). 4) Independent linguistic system for each language (two different independent systems of meaning). 5) Translation of concepts and meanings from the second language into the first language in order to understand them (subordination of the second language to the first language).
Age of acquisition	6) Early bilingualism: 1-6. Simultaneous bilingualism. 2-6. Sequential bilingualism. 7) Late bilingualism.	6) Occurrence in childhood: 1-6. Acquisition of both languages during the same period. 2-6. Acquisition of the second language after a relatively short period of acquiring the mother tongue. 7) Occurs after childhood, in which the individual acquires their second language through learning.
The effect of L2 learning on L1 retention	8) Positive bilingualism (host). 9) Negative bilingualism (subtractive).	8) Both languages enjoy equal importance in society. 9) The first language is replaced by the second language.
Language status and learning environme nt; support	10) Elite bilingualism. 11) Popular bilingualism. 12) Situational bilingualism.	10) Specific to individuals who speak their native language and have a second language that gives them added

for L1 skills		value in their community. 11) Specific to minorities, where their language is not important in the majority society. 12) Acquisition and use of a second language in specific circumstances such as work, colonisation, mixed marriage, etc.
Cultural identity	13) Cultural duality while preserving the first language. 14) Monoculturalism with the acquisition of a second language. 15) Linguistic duality with cultural loss.	13) Acquisition of the cultures of both languages without losing the original culture. 14) Connection to the culture of the mother tongue with learning the second language as a tool for communication only, without acquiring its culture. 15) Learning the second language leads to the loss of the original culture and is at the expense of the mother tongue.

Based on the table, the types of bilingualism that are strongly present in society can be explained as follows:

Balanced bilingualism: A state of bilingualism in which an individual achieves equal proficiency in both languages (L1 + L2). This individual is equally fluent in both languages and has mastered them equally. De Groot (2011) explains that this type does not necessarily mean high proficiency in both languages.

Dominant bilingualism: or unbalanced bilingualism. This is a situation in which an individual achieves higher proficiency in one language than in the other.

Compound bilingualism: A state of bilingualism in which an individual acquires both languages in the same context/environment. In this case, the linguistic signs and symbols in both languages are subject to a single common system of meanings. The word "dal" in the first language and the second language has the same meaning in the memory/mind.

Coordinated bilingualism: Unlike the previous type, the second language is acquired in an environment different from that in which the first language was acquired. In other words, the two languages were not acquired at the same time. Accordingly, the bilingual person has two independent and different systems of meaning.

Early bilingualism: This refers to individuals who acquired their second language at an early age, i.e. during childhood.

Late bilingualism : This refers to bilinguals who acquired their mother tongue before the age of eight and learned their second language after that (Moradi, 2014, p. 108).

Additive bilingualism: Both languages have social importance and value. Since the criterion or dimension used to determine additive and subtractive bilingualism is the extent to which learning the second language affects the preservation of the mother tongue, this type of bilingualism (additive) enables the individual to improve their second language without losing proficiency in their first language.

Subtractive bilingualism: A state of bilingualism in which one of the two languages is devalued and marginalised. Often, it is the mother tongue that is excluded, marginalised and lost. Here, learning the second language comes at the expense of losing the mother tongue. This means that there is a lost language (the mother tongue). (Subtractive).

There are many types of bilingualism, depending on the criteria and dimensions used by researchers to classify individuals who speak two languages. These criteria focus on cognitive, developmental, linguistic and socio-cultural dimensions. Regarding the relationship between types of bilingualism and what is cognitive and metacognitive, a group of studies has shown that the nature of the effect of bilingualism (positive or negative) depends on the type of bilingualism that the individual has (Altman et al., 2018; Bialystok, 1988; Ricciardelli, 1992). When bilingualism is balanced, it has a positive effect on the individual by enabling them to enjoy cognitive benefits and advantages that monolinguals and unbalanced bilinguals do not have (Carranza, 2009). Similarly, host bilingualism has a positive effect on cognition, while dominant bilingualism has a negative effect.(Kudo & Swanson, 2014) Thus, in order to study the relationship between metalinguistic awareness as a metacognitive ability, it is necessary to identify and control for key variables, particularly the type of bilingualism and the level of proficiency in the second language.

Metalinguistic awareness in relation to bilingualism patterns and linguistic proficiency

Studies conducted in the early 20th century on bilingual individuals showed that these individuals suffer from learning problems. These studies also warned of the disadvantages and negative effects of bilingualism on children's development and cognitive growth. It was even considered a social epidemic that limits children's cognitive abilities and an obstacle that affects them throughout their lives in various areas. Accordingly, these studies concluded that monolingual children outperform bilingual children in a range of cognitive tasks . (Macnamara, 1966; Saer, 1923; Saunders, 1988). Thus, the studies conducted during this period were negative in their view of bilingualism and related variables. This means that these studies concluded, on the whole, that bilingualism has negative effects on cognition. In contrast, a scientific perception emerged based on the assumption that bilingualism has cognitive advantages. This began specifically with the study conducted by Peal and Lambert (1968), which was the starting point for a reconsideration of the relationship between bilingualism and cognitive processes. It also served as a systematic review of previous studies, highlighting the methodological weaknesses of these studies, which did not take into account the socio-economic status of the subjects, their level of proficiency in the second language, gender, age, and other factors. Their study confirmed that these factors and variables had confused previous studies and influenced their results, steering them towards predetermined goals. From this point on, studies concerned with bilingualism underwent a major shift in their understanding and approach to the phenomenon.

Among the possible effects of bilingualism is metalinguistic awareness, but the nature of this effect remains controversial. As is the case with the relationship between bilingualism and cognitive variables and processes, studies have been divided into those confirming the existence of cognitive advantages specific to bilinguals and studies denying these advantages. Studies also differ, albeit few in number, on the nature of the effect of bilingualism on metalinguistic awareness. One group shows that bilinguals outperform their monolingual peers in terms of metalinguistic awareness (Altman et al., 2018; Bialystok, 2001; Cummins, 1978; Festi & Vender, 2024), while another team denies the existence of this superiority and metacognitive advantage (Miller, 2021; Souza et al., 2016; Palmer, 1972; Rosenblum & Pinker, 1983). However, what interests us in this article is to reveal the role of the bilingualism variable in influencing metalinguistic awareness.

Before delving into the relationship between bilingualism and linguistic awareness, it is worth noting that among the early

studies that examined this relationship was Cummins' (1978) study, which confirmed that bilingualism increases children's metalinguistic awareness and helps them analyse language input and become aware of linguistic processes. This means that bilinguals who possess strong shared core competence do not merely transfer knowledge and skills from one language to another, but go beyond that to consciously reflect on the structure of the two languages and compare them. This develops a metalinguistic awareness that enables them to detect differences and similarities between the two languages and understand the relationships between sounds and meanings. In the same context, a recent study by Wang (2016) concurs with Cummins' findings that language transfer at the metacognitive level involves several skills, such as phonological awareness, structural awareness/decoding , awareness of definitions and functions, and so on. This confirms that bilingualism includes a cognitive advantage that allows the bilingual to transfer metacognitive and metalinguistic abilities and skills from one language to another.

We have previously shown that determining the nature of the effect of bilingualism (positive or negative) on cognitive and metacognitive processes depends on determining the nature or type of this bilingualism, as it is not possible to venture to make judgements or assumptions that confirm or deny the positive effect of bilingualism on metalinguistic awareness. Therefore, it was imperative for researchers of bilingualism to arm themselves with the methodological rigour required to accurately determine the type of bilingualism studied in relation to metalinguistic awareness. In this context, we will focus on host, balanced and dominant bilingualism and analyse the nature of its impact on metalinguistic awareness.

Among the first researchers to note the importance of determining the pattern and level of bilingualism in relation to metalinguistic awareness was Bialystok (1987), who emphasised that the level of bilingualism is the variable that controls the growth and development of metalinguistic awareness in bilinguals. This means that the level of proficiency of bilinguals determines the nature of their bilingualism, which in turn determines the nature of the impact on their metalinguistic awareness. Bialystok relied on the theoretical framework presented by Cummins (1976) regarding threshold theory. To discuss the cognitive advantages of bilingualism, threshold theory assumes that "it is necessary for a child to reach a certain level (threshold) of linguistic development and fluency in each language in order to acquire advantages and avoid disadvantages in their cognitive development. Cummins identified two thresholds: the upper threshold and the lower threshold of linguistic competence" (Takakuwa et al., 2005, p. 2222).

This theory can be understood well by comparing it to a three-storey house separated by two thresholds. These two thresholds represent levels of proficiency, where each level has specific outcomes and consequences for the bilingual child. The level below the first threshold represents children who have very limited ability to speak both languages, i.e. those children with limited proficiency in both languages. Here, the results of bilingualism are negative. The middle level includes children who have developed age-appropriate proficiency in one language, while proficiency in the other language remains limited (dominant bilingualism). Finally, the highest level, , includes children who have age-appropriate proficiency in both languages, i.e., balanced bilingualism (Baker, 2011).

To emphasise the cognitive effects of bilingualism, Cummins argues that the two thresholds he proposes are necessary conditions for linking bilingualism to its cognitive benefits. Reaching the first threshold is sufficient to avoid cognitive deficits, but reaching a second, higher level of linguistic proficiency is necessary to accelerate cognitive development. Thus, bilingual children must reach the minimum threshold in both languages to avoid negative effects on their cognitive development. However, limiting these children to this level does not guarantee that they will benefit from any cognitive advantages, as these benefits are necessarily conditional on reaching the higher threshold level in both languages (Takakuwa et al., 2005). Thus, this theory explains the relationship between bilingualism and its cognitive advantages based on determining an individual's linguistic competence in both languages.(Panadaki, 2015) The theory explains that problems with bilingualism arise when there is a low level of proficiency in both languages, a situation that leads to negative cognitive effects. (Lasagabaster, 1998)

Bialystok (1987) applied the findings of this theory to study metalinguistic awareness in relation to bilingualism patterns and language proficiency levels. She concluded that monolinguals did not excel in metalinguistic awareness tasks, while dominant bilinguals and balanced bilinguals were able to excel in these tasks and achieve better results than monolinguals. However, Cummins noted differences between two types of bilingualism in the level of metalinguistic awareness: dominant bilingualism and balanced bilingualism. She concluded that balanced bilinguals are better at metalinguistic awareness tasks than dominant bilinguals, such as analysing grammar rules and identifying whether a sentence is correct or incorrect. This is because the latter group showed clear superiority in language processing control and linguistic knowledge analysis. Thus, it appears that the higher the level of linguistic competence, the greater the degree of

control and monitoring of language, and therefore the degree of metalinguistic awareness.

Regarding the relationship between metalinguistic awareness and both propositional bilingualism and host bilingualism, Malakoff & Hakuta (1991) have shown that family and community support is a decisive factor in determining the pattern of bilingualism and its status in society. The presence of this support makes bilingualism host bilingualism with a positive effect, while the absence of this support leads to bilingualism with a negative effect. Thus, this study shows that hosting bilingualism has a positive effect on the linguistic and metalinguistic development of bilinguals, while subtraction bilingualism has a negative effect on an individual's linguistic and cognitive development. Francis (1999) reached almost the same conclusions, particularly with regard to the relationship between patterns of bilingualism and metalinguistic awareness, emphasising that the absence of societal tendencies that devalue one of the two languages (oppositional bilingualism), especially when it comes to bilingual children of school age, necessarily leads to a linguistic situation in which both languages enjoy community support. This makes this host bilingualism conducive to the growth and development of metalinguistic awareness.

To answer the questions posed in this research, based on our analysis and discussion of a number of studies that have examined the relationship between bilingualism and metalinguistic awareness, particularly those that have focused on the types of bilingualism that have the greatest impact on this awareness, we can conclude that the effect of bilingualism on an individual's metalinguistic awareness is not constant and uniform, but varies according to the pattern of bilingualism and the individual's level of linguistic competence. The results show that some patterns of bilingualism contribute to the enhancement and development of metalinguistic awareness, as is the case with balanced bilinguals and host bilinguals, where the interaction of the two different language systems supports metalinguistic awareness. In contrast, other bilinguals do not benefit from such advantages, such as dominant bilinguals and , due to the dominance of one language over the other or the absence of family and community support for one of the two languages. Thus, the impact of bilingualism on metalinguistic awareness is determined by the nature of the interaction between the two different language systems, the patterns of bilingualism, and the degree of linguistic competence, rather than simply by the existence of bilingualism.

Conclusion

The above analysis shows that bilingualism is not in itself a decisive factor in the growth and development of metacognitive abilities, which include conscious linguistic ability. Thus, the advantage that bilinguals have over monolinguals in terms of metacognitive abilities is conditional on the type of bilingualism they possess. As we have shown previously, bilingualism that can be classified as having a positive effect (host bilingualism, balanced bilingualism, early bilingualism, simultaneous bilingualism, etc.) is capable of developing an individual's metalinguistic abilities by strengthening their awareness of language structure and enhancing their metacognitive skills, which are represented in the self-monitoring of linguistic processes. Conversely, negative bilingualism (subtractive, dominant, late, sequential, etc.) does not allow individuals to benefit from these advantages. Nevertheless, these conclusions cannot be generalised, but rather emphasise the need for future studies to focus on the type of bilingualism and move beyond traditional generalisations that viewed bilingualism as a factor that either positively or negatively affects cognitive and metacognitive abilities without taking into account the nature of this bilingualism. In addition, bilingualism is not devoid of a socio-cultural context, which makes the integration of social and cultural dimensions a methodological necessity in studies of bilingualism in relation to metacognitive awareness. Just as the impact of bilingualism is inseparable from its nature and the individual's level of proficiency in it, it is also inseparable from the social environment that embraces it.

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