

## Bilingualism and Its Impact on Psychological Assessment

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The psychological measurement of Spanish-speaking individuals has both a short past and a shorter history. Despite the century-long focus on testing individuals, the focus on Spanish-speaking ones is traceable back to the 1970s (Padilla, 1971). And, when the focus involves more specific assessment of bilingual Spanish speakers, it is not until much later, such as the work of Ardila and colleagues, that this issue is first attended to. Despite this recent interest, the literature is long on theory and short on empirical studies. In addition, there is a clear focus on linguistic variables to the exclusion of socio-cultural ones. This chapter attempts not only to provide the history and trajectory but more important to understand bilingualism and its effect of testing Spanish speakers. In addition, emphasis is placed on considering bilingualism as an initial step in fostering the idea that the meta-construct maybe actually be sociocultural understanding and not simply appreciation of linguistic variables.

### Demographics and Heterogeneity

Hispanic or Latino refers to an individual of Cuban, Puerto Rican, Mexican, South or Central American, or other Spanish culture or origin (e.g., Spain) regardless of race. Hispanic or Latino origin refers to the heritage, lineage, nationality group, or country of birth of the person or the person's parents or ancestors before they arrived in the USA. It is important to distinguish between ethnicity and race because people of Hispanic origin may be of any race. Most Latinos identify themselves as "white" or "some other race" (U.S. Census Bureau, 2012a, 2012b). In this chapter, the terms Hispanic and Latino will be used interchangeably. According to the latest census data, Hispanics account for more than half of the total US population growth in the past decade. Latinos grew 43% (15.2 million), which was four times more than the overall population growth of 10%, and accounted for most of the nation's growth (56%) (U.S. Census Bureau 2012a). Currently, Hispanics are the largest and fastest growing minority group in the country. The USA has a population of 308,745,538 of which approximately 50.5 million

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individuals or 16% are Hispanic; however, this amount does not include undocumented Hispanics (U.S. Census Bureau 2012a). The number of undocumented Latinos is estimated at 11.2 million, with 8 million being part of the workforce (Passel & Cohn, 2011). This data imply that a large number of the US population is also bilingual, and considering that the Hispanic population is growing at a faster pace than the population as a whole, it is expected that by 2050 Latinos will no longer be a minority in the USA (U.S. Census Bureau 2012b); therefore, there will be a shift from a predominant monolingual population to a mostly bilingual one. It is estimated that more than half of the world's population is bilingual or multilingual at some level of proficiency (Paradis, M., & Libben, G. (1987), and the USA will soon be a significant contributor to this number. Recent data indicates that, in the USA, of Hispanics 18 and older, 18.7% speak only English at home. Also, 3.7% of foreign-born Latinos and 37.1% of native-born Latinos speak only English at home. In contrast, 94.1% of non-Hispanic whites speak only English at home and 81.2% of Hispanics older than 18 speak a language other than English at home. Of these, 35.2% speak English very well and 46% speak English less than very well (Pew Hispanic Center, 2012a, 2012b). As it would be expected, Latinos born in the USA have considerably better English skills than foreign-born Latinos. Regarding Hispanics that are younger than 18 years, 31.7% speak only English at home, in contrast with 68.4% that speak a language other than English at home. On the other hand, 94.4% of non-Hispanic whites under 18 years speak only English at home. Of the Latinos that speak a language other than English at home, 50.3% speak English very well and 18.1% speak it less than very well (Pew Hispanic Center 2012a). This data suggests that older Hispanics tend to have more difficulties with English when compared to younger ones. This difference might partly be due the fact that language acquisition is facilitated at younger ages and that younger Hispanics have greater exposure to situations in which they have to speak English. The data also suggest that a considerable number, 64.1% or 15.715241, of Hispanics in the USA speak English poorly (Pew Hispanic Center 2012a). Even though it is common to conglomerate all Latinos into the same group, regardless of origin, there is a great degree of heterogeneity depending on the native country that should be taken into account. For example, regarding English proficiency, 46.9% of Latinos from Mexico and 40.3% from Central America speak English less than very well. In contrast, 27.6% of Hispanics from the Caribbean and 19% from South America speak English less than very well (Pew Hispanic Center 2012a). These percentages suggest that English proficiency varies as a function of region of origin. At the same time, there are several characteristics that are common and shared among Latinos. Most Hispanics speak Spanish, their main religion is Roman Catholic, and they share essential values. A good example of a shared value is the importance that Latinos place in the family. The family is central, and its stability affects well-being and personal identity (Marin & Marin, 1991). However, it is important to consider that beyond the shared values and customs, there are several values, beliefs, and practices within each subgroup of Latinos that are different among subcultural groups (Cofresí & Gorman, 2004), for example, between Cubans and Argentineans. These differences usually include, but are not limited to, language, types of employment, socioeconomic status, religion, character traits, belief systems, culture, principles, and educational background (Beals & Beals, 1993).

Because of these differences, Hispanics should not be considered a unified ethnic group. There is an evident division that can be made among Hispanics living in or from the Iberian Peninsula and those living in or from the Americas. For example, in terms of customs and behaviors, Latinos from Spain are usually more similar to other Europeans than to Latin Americans; in contrast, Latinos in the USA tend to be more similar to Hispanics in the Latin American countries. Furthermore, Hispanics living in or from the Americas can be subdivided into two groups. Group number one is North America without Mexico. Group number two includes Mexico, Central, and South America. Latinos in North America and Canada are more likely to have a better knowledge of English and the American way of living. Individuals in group number 2 can be divided further according to minor language and cultural differences. In the translation and norming procedure for the Wechsler scales in Spanish, Latin

## 2 Bilingualism

Americans were subdivided into American (e.g., Honduras),

Depending on the sub maintenance (Sattler, 2001) vary in speed, intonation, pronounce every letter and syllable, social class, education (Cofresí & Gorman, 2004). nary usage, and each country speech. Minor phonological particular slang terms that, for instance, in Chile, a T-shirt not understand "remera," and word "bus." In Chile and Cuba, a bus is called "guagua." English, there is also slang (Puente & Ardila). Nonetheless, as haughty or overly proper Hispanic subcultural group variables, the type of Spanish

## Bilingualism and Biculturalism

Like Hispanics in general, share common characteristics as bilinguals depending on the and interaction between the abilities to consider. Most Hispanics between the language Latinos in the USA are also the mixture of the mother tongue become intertwined.

Historically, in the USA necessity. Considering the knowledge and function of two languages at a young encourages bilingualism, (Latinos) tend to lose vocabulary in English, their mind (Manuel-Dupont) for which there is no example, Spanish does not people are incapable in that language, translation (Pontón & Ardila, 1999) in English into the

Depending on the subcultural group, there are differences in linguistic skill and language maintenance (Sattler, 2001). Among different subcultural groups, it is common for spoken Spanish to vary in speed, intonation, and pronunciation. For example, some Spanish speakers carefully pronounce every letter and syllable in a word, while others soften or drop the final "s" in words. In addition, social class, education level, and specific region may also influence the way Spanish is spoken (Gofresí & Gorman, 2004). Regionalisms or vernacular idiosyncrasies are common in Spanish vocabulary usage, and each country will also have its own slang terms that are used in conversational speech. Minor phonological differences are also present (Puente & Ardila, 2000). Some words and in particular slang terms that are used in one Spanish-speaking country are not understood in others. For instance, in Chile, a T-shirt is called "polera," and in Argentina it is called "remera." A Chilean would not understand "remera," and an Argentinean would not understand "polera." Another example is the word "bus." In Chile and Uruguay, bus means "bus" and "microbus," or "micro" is also used, but in Cuba, a bus is called "guagua" which would mean "baby" in Chile. However, like there is a Standard English, there is also standard Spanish that is usually easily understood by any Spanish speaker (Puente & Ardila). Nonetheless, because standard Spanish is not commonly used, it may be perceived as haughty or overly proper in an assessment situation (Cofresí & Gorman). The variability among Hispanic subcultural groups is also present in bilingual Latinos. Depending on the above-mentioned variables, the type of Spanish and type of English a bilingual individual uses will differ.

Historically, in the USA, in contrast with Europe, bilingualism has never been promoted or seen as a necessity. Considering that true bilingualism requires equal mastery of both languages in all areas of knowledge and functioning and also equivalent demands for the use and formal instruction in the two languages at a young age (before 10), most Americans are not true bilinguals. In a culture that discourages bilingualism, individuals whose mother language is not part of the majority culture (Latinos) tend to lose vocabulary, syntactic representation, proficiency, and grammatical mastery (Pontón & Ardila, 1999). For example, when a Spanish speaker in the USA gains new concepts and vocabulary in English, then the individual translates the newly learned concepts into Spanish in his or her mind (Manuel-Dupont, Ardila, Rosselli, & Puente, 1992). Moreover, there are culture-specific terms for which there is no appropriate translation in the culture of origin or the dominant culture. For example, Spanish does not have a word for “modem,” and English does not have a word for “taco.” When people are incapable of translating a word into another language because the word does not exist in that language, transliterations are produced. For example, Hispanics may say “el raite” instead of ride (Pontón & Ardila, 1999). It is common for bilingual Hispanics in the USA to adapt words and phrases in English into their Spanish vocabulary; this is typically known as “Spanglish.” For example,

Latinos often say "dame una ride" which would mean "give me a ride." However, a monolingual Spanish speaker might not understand such phrases because he or she is not familiar with the English language and the American culture. The interference and mixture of the two languages can result in poor language mastery in both languages. Moreover, the Hispanic media in the USA promotes Hispanicized terms and Spanglish by using them in commercials. Latino children grow up using these terms as representations of a hybrid language that cannot be formally assessed in either English or Spanish (Pontón & Ardila, 1999).

In the USA, Spanish is not socially, academically, economically, and politically equivalent to English, and it is often viewed as a marginal language. Usually, foreign-born Latinos and Latinos in general are required to speak English at work, at school, and in general everyday activities of the mainstream culture. Spanish books and general cultural activities in Spanish are limited in the USA (Ardila et al., 2000). On the other hand, Hispanics usually use Spanish with the family, in their community, and with friends (Cofresí & Gorman, 2004). Therefore, one language or the other is used more or less depending on the context and setting. Furthermore, it is common for second-generation Latinos in the USA to speak English among themselves. There are two reasons that may explain this. First, they know English better because Spanish is only spoken at home, and, second, they have a stronger identification with the Anglo culture than the Hispanic one because they were born in it. This situation often leads to family conflict because parents may be obligated to speak English or they can force their children to speak Spanish or children can use English to confuse or bother their parents and grandparents (Manuel-Dupont et al., 1992).

Another source of conflict is language proficiency. People may become conflicted when their language ability is not sufficient to the task or they simply do not fully comprehend what is expected of them. In a bicultural context, the challenge of meeting the linguistic demand of two cultures can be very stressful (Cofresí & Gorman, 2004). Further, each language has a different culture and value system attached to it, and this may place particular constraints in an individual sense of identity (Northover, 1988). Also, Latinos may express their feelings more effectively in one language (usually Spanish) than the other (Rodríguez Gomez & Caban, 1992). People that live in a bicultural context usually maintain close relations with their mother culture, while their everyday lives occur in the dominant culture, and develop behaviors that allow them to maintain their life in both cultures (Valdez, 2000).

## Types of Bilingualism

Some variables are considered crucial to pinpoint the degree of bilingualism: age and sequence of acquisition, method of acquisition, language of schooling, contexts of the two languages, patterns of use of the two languages, personal and social attitudes toward each language (e.g., Albert & Obler, 1978; Ardila, 2007; Kilborn, 1994; Paradis, 1978; Siguan, 2001; Vaid, 1986), and, it could be added, individual differences in verbal abilities. However, these are only general variables, and many variations can be found. (1) The age, sequence, and method of acquisition are not necessarily correlated with the degree of mastery of each language. (2) Language of schooling may indeed be a highly significant variable. (3) Personal and social attitudes toward the two languages can present significant variations. (4) Individual differences in the ability to learn a second language have rarely been addressed in the literature on bilingualism. But evidently, very significant differences are observed in the ability to learn and use not only a first but also a second language (Ardila, 1998).

Bilingualism can be divided according to different criteria, such as mastery of the two languages and age of acquisition of the second language.

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mastery of the two languages

## Mastery of the Two Languages

A frequently used distinction in bilingualism refers to the mastery of both languages (Weinreich, 1953). Three situations can be distinguished:

*Coordinate Bilingualism.* The linguistic elements (words, phrases) are all related to their own unique concepts. That means an English-Spanish bilingual speaker of this type possesses different associations for "table" and for "mesa." There are in consequence two lexical and two semantic systems.

*Compound Bilingualism.* Speakers of this type attach their linguistic elements (words, phrases) to the same concepts. For them, a "table" and a "mesa" are two words for the same concept. There are in consequence two lexical systems but only one semantic system.

*Subordinate Bilingualism.* The linguistic elements of one of the speaker's languages are only available through elements of the speaker's other language. This type is typical of, but not restricted to, beginning L2 learners. "Mesa" means table, and table has certain semantics. There is one semantic system, and lexicon in the second language is accessed using the first-language lexicon.

It is important to note that a bilingual can simultaneously be classified in more than one category, and when learning a second language, mastery progressively increases.

## Time of Acquisition of the Second Language

Bilinguals can also be distinguished according to the time of acquisition of the second language (e.g., Bialystok & Hakuta, 1999; Birdsong, 1992; DeKeyser, 2000; Flege, 1999; Genesee & Nicoladis, 1995).

*Simultaneous Bilingualism.* Sometimes also named *authentic bilingualism*. Learning two languages as "first languages" (two native languages). Infants who are exposed to two languages from birth will become simultaneous bilinguals. If exposure to the second language occurs after age 3–5 years, the term *sequential* bilingual is used.

*Early Bilingualism.* The second language is acquired before completing the acquisition of the first one; it means before the age of about 12 years.

*Late Bilingualism.* The second language is acquired after completing the acquisition of the first one. Second language is learned mediated by the first language. Sometimes, the term *consecutive* or *successive* bilingualism is used to refer to learning one language after already knowing another.

## Some Additional Distinctions

Frequently, some additional distinctions are used in the bilingual literature (e.g., Crystal, 1987; Fabbro, 1999; Paradis, 2004; Romaine, 1989).

*Balanced Bilingualism.* Equal proficiency in two languages across a range of contexts. This term usually describes a native-like competence in two languages.

*Dominant Language.* Preferred and best-spoken language. Dominance in languages varies according to the context where those languages are used and even across time.

*Receptive Bilingualism.* Being able to understand two languages, but express oneself in only one.

*Elective or Elitist Bilingualism.* Persons who choose to study a second language.

*Natural, Social, or Circumstantial Bilingualism.* People who grow up in communities where several languages are spoken.

*Distractive Bilingualism.* When acquisition of the first language is interrupted and insufficient, or unstructured language input follows from the second language.

*Subtractive Bilingualism.* The addition of a second language leads to gradual erosion of competence in the first language.

*Additive Bilingualism.* The speaker adds a second language without any loss of competence to the first language.

*Semilingualism.* An individual who lacks full competence in either language.

*Diglossia.* A specific relationship between two or more varieties of the same language in use in a speech community in different functions.

*Ambilingualism.* An individual with native competency in two languages. Sometimes the term *balanced bilingualism* is used; the latter emphasizes the similar competence in both languages.

*Individual Multilingualism.* An individual who has access to more than one linguistic code as a means of social communication.

*Societal Multilingualism.* Refers to the state of a linguistic community in which two languages are in contact, with the result that two codes can be used in the same interaction and that a number of individuals are bilingual.

*Pidgin.* Is a communication system developed among people that do not share the same language but need to talk because of whatever reason?

*Creole.* Language is a pidgin that has become the native language of a community. Pidgin and Creole represent in consequence two steps in the same process (Crystal, 1987).

*Dialect.* Refers to a variation (usually, but not only, geographical) in a language that is understandable by other speakers of the same language.

## Two Proposed Additional Classifications of Bilingualism

*Strong vs. Weak Bilingualism* (i.e., degree of similarity between the two languages). Most of the research on bilingualism has not distinguished the specific languages involved. However, the degree of linguistic similarity or difference between the two languages may be significant. The *interlinguistic distance* (James, 1979) between the two languages may also be included as a classification criterion in bilingualism. The linguistic distance between Spanish and Italian is minimal, whereas the linguistic distance between Spanish and Chinese is enormous. It can be proposed to name the Spanish-Italian bilingualism as a "weak bilingualism" and to name the Spanish-Chinese bilingualism as a "strong bilingualism" (Ardila, 2007). When learning Italian, a Spanish speaker is acquiring just a little bit of new language, whereas when learning Chinese, he/she is learning a large amount of new language. Of course, any degree of similarity could exist, and "weak" and "strong" bilingualism refers to a continuum. Furthermore, the relative distance could be applied to different levels of the language: phonology,

lexicon, grammar, and even syntax. Greek is mild, but the gap between Spanish and Portuguese is large.

This similarity between languages has suggested that the similarity in cases of aphasia (Gall, 1967) is due to the proximity of structurally similar languages leading to more separate neural representations. This has been suggested: the less the similarity, the more separate (Paradis, 1987).

*Context-Dependent vs. Context-Independent Bilingualism.* Context-dependent bilingualism is particular to a particular context and is dependent on the environment of cognition. Play bilingualism is associated with a particular context (even olfactory), some Spanish is used (on the blackboard), and certain aspects of the cognition required for L2 in a specific context (for example, appropriate language). L1 is used; conversely, for context-independent bilingualism, L1 is used (and even only) within a particular context. Usually the other language is context-dependent. Rarely, a bilingual individual can use both texts. For instance, few bilingual individuals use the same language. Simultaneous bilingualism is the same context. This distinction could be simple "dissociated" (Crystal, 1987). Of course, a particular individual can use both languages in a particular context or use only one language in a particular context.

## Variables Affecting Bilingualism

Bilingualism is a complex phenomenon. About the processes involved in the acquisition of a second language, there have been many studies. In the right hemisphere, where language is processed, research finds that the left hemisphere is involved in the early stages of learning a second language. Several studies were conducted that found that the left hemisphere is involved in the early stages of second-language acquisition. There continues to be research on this topic.



lexicon, grammar, and even prosody. For instance, the phonological distance between Spanish and Greek is mild, but the grammatical distance is large. Conversely, the phonological distance between Spanish and Portuguese is large, but the grammatical distance is small.

This similarity between the two languages may impact the cerebral representation. It has been suggested that the similarity between both languages can affect the relative rate of language recovery in cases of aphasia (Galloway, 1978; Lebrun, 1976; Whitaker, 1978). It has been proposed that the proximity of structurally similar languages may require additional effort to avoid interference, leading to more separate neural structures (Albert & Obler, 1978). The opposite point of view has also been suggested: the less two languages have in common, the more they are represented separately (Paradis, 1987).

**Context-Dependent vs. Context-Independent Bilingualism.** Any human activity is carried out in a particular context and is associated with a specific type of cognition. Language is the major instrument of cognition. Playing chess, solving a mathematical problem, or presenting a lecture about bilingualism is associated with some perceptual information (spatial, visual, auditory, tactile, and even olfactory), some specific motor acts (moving the chess pieces, using a calculator, or writing on the blackboard), and certain cognitions. The language used is one of the elements (or the instrument) of the cognition required to carry out that activity. Quite frequently, the bilingual learns to use L1 or L2 in a specific context (e.g., for solving mathematical problems L1 is used, but for teaching L2 is the appropriate language). L1 may be the family language, and for talking about family and home issues, L1 is used; conversely, for working, L2 is the required one. Many bilinguals can use L1 or L2 mainly (and even only) within a specific context, but they have difficulties in using it in a context where usually the other language is the correct language. It means that quite frequently, bilingualism is context dependent. Rarely, a bilingual is equally capable of using either language in exactly the same contexts. For instance, few bilinguals are equally capable of solving mathematical problems in either language. Simultaneous translators may be an example of bilinguals using two languages in exactly the same context. This distinction is obviously a matter of degree and not a dichotomous distinction. This distinction could be named as "context-dependent" vs. "context-independent bilingualism" or simple "dissociated" (context-dependent) vs. "associated" (context-independent) bilingualism. Of course, a particular individual can behave as a context-independent bilingual for some activities (both languages can be used in that situation) and context-dependent for some other activities (he/she can use only one language in that situation). Different degrees of context dependency can be found.

### Variables Affecting Bilingualism Acquisition

Bilingualism is a complex phenomenon, and there continues to be several theories among researchers about the processes involved in language acquisition. Manuel-Dupont et al. (1992) described that over the years, there have been several researchers that have examined strategies of acquisition used by second-language learners. On the one hand, early researchers believed that linguistic capabilities of the right hemisphere were more characteristic in the early stages of second-language acquisition. Furthermore, research findings suggest that processing in the right hemisphere is clearly evident in the early stages of learning in second-language acquisition (Manuel-Dupont et al.). On the other hand, several studies were conducted to provide evidence that the right hemisphere is dominant in the beginning stages of second-language acquisition. Manuel-Dupont et al. stated that studies continued to reveal that the left hemisphere is predominantly for functioning of language, while there was a lack of usage in the right hemisphere in the final stages of second-language acquisition (Albert & Obler, 1978). There continues to be a lack of evidence as to whether the right hemisphere is involved in later

or early stages of second-language acquisition (Manuel-Dupont et al.). McLaughlin (1977) further emphasized that there are many issues unproven which include and are not limited to the following: (1) Is there a biologically based critical period for language acquisition? (2) Does bilingualism have inevitable consequences? (3) How does first-language learning differ from second-language learning? (4) Does bilingualism have positive effects on intelligence, education, or cognitive processes? To illustrate, children learn a second language more efficiently than adults, but available evidence contradicts such findings (McLaughlin). In the field, there continues to be undocumented assertions and lack of evidence about language acquisition in bilinguals.

In order to determine the variables that affect language acquisition in bilinguals, a clear understanding has to be evident in the actual biological processes of language. At present, there is a lack of available evidence in the existing literature that could create that clear understanding. An example of a recent study that demonstrates the need for clear evidence (Sebastián-Gallés & Bosch, 2002) investigated the impact of bilingualism in acquisition of phonotactic information by examining the timing and exposure to a second language. The conclusion was that it remains unclear as to whether phonotactics of a segment can be learnt by not having a segment that is clearly involved. Despite the lack of evidence-based literature, there is some research that investigates the age of language acquisition in bilinguals. Hernandez and Li (2007) concluded that sensorimotor learning is an important milestone that determines variables associated with age of language acquisition.

From the existing literature, it is clear that there is a need to further investigate how bilinguals acquire and store language. It is important to know an individual's demographic background with regards to language acquisition, for instance, but not limited to age of entry into another country, length of residency, type of exposure to second language, level of education, and dominant language usage (Bahrack, Hall, Goggin, Bahrack & Berger, 1994). This information is important as there is a need to further investigate whether these could be variables that affect language acquisition in bilingualism.

## Proficiency of Bilingualism

The scientific literature addressing matters regarding bilingual individuals clearly states that proficiency is a dimension, varying among individuals, that needs to be addressed (Manuel-Dupont et al., 1992; Proctor & Silverman, 2011). The Merriam-Webster Dictionary defines the word proficiency as the "advancement in knowledge or skill" as well as "the quality or state of being proficient" (Proficiency, 2012). Moreover, the word proficient is defined as being "well advanced in an art, occupation, or branch of knowledge" (Proficient, 2012). Thus, when questioning whether someone is proficient in a language, the following two questions arise: What constitutes proficiency? Where in the continuum of proficiency does this person fall under (Proctor & Silverman)?

Determining, measuring, and assessing the degree of proficiency in bilingual individuals are complex tasks. It involves addressing several modalities of an individual's ability, including, but not limited to, grammatical knowledge and skills, aspects of communication, and the skills associated with effective communication. Aspects of communication involve learning, reading, writing, oral communication, and numeracy. As a whole, these skills are able to provide information pertaining an individual's performance ability and competence across a range of contexts. In addition to the aforementioned modalities, vocabulary and literacy development, cross-language interactions and competence in sociolinguistic discourse, and strategic skills should be assessed. Furthermore, the domain of communication is also another factor that helps determine proficiency of bilingualism (Manuel-Dupont et al., 1992). Domains of communication include home, school, work, and other areas of functioning. Though several domains and modalities are considered, it is important to note

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Laughlin (1977) further limited to the following:

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gual individuals are com- y, including, but not lim- he skills associated with ng, writing, oral commu- ation pertaining an indi- xts. In addition to the nguage interactions and sessed. Furthermore, the ficiency of bilingualism school, work, and other d, it is important to note

that bilingualism is a construct in which level or degree of proficiency may differ across modalities and domains. For instance, a person might be highly proficient in comprehending a certain language but unable to express his thoughts in an effective communication form. Likewise, a person may be proficient in one language in one domain (i.e., school) but not in another (i.e., home). Manuel-Dupont et al. also denote that spheres of knowledge are prevalent among bilingual individuals. They imply that it is not unusual for bilinguals to have mastered certain domains in one of their spoken languages and not the other (home-related vocabulary vs. work-related vocabulary). Cofresí and Gorman (2004) state that among Spanish-English speakers, the use of the Spanish language is an important tool in the world of family, community, and friends, whereas the use of the English language is important for the success in school and work settings.

Picture vocabulary and listening comprehension are two domains that have been used to assess the proficiency of bilingualism. In a study conducted by Archila-Suerte, Zevin, Bunta, and Hernandez (2012), a significant correlation between picture vocabulary and listening comprehension was used as a measurement of English and Spanish proficiency among bilinguals and monolinguals. Depending on when the second language was learned, bilinguals in this study were classified into three groups: early bilinguals who were exposed to the English language before the age of 5, intermediate bilinguals who were exposed to English at the age of 6 but before 9, and late bilinguals were those exposed to the English language after the age of 10. Results showed a significant difference in English proficiency between monolinguals and the three different groups of bilinguals. Further analysis revealed that the intermediate group did not significantly differ from the early or late group. Not surprisingly, the study also revealed a significant correlation between English proficiency and the use of the English language. No significant findings were found among the three bilingual groups in English proficiency. Like English proficiency, Spanish proficiency was significantly correlated with Spanish use, and significant differences among the early, intermediate, and late groups in Spanish proficiency were found. Findings indicated that the early bilingual group had a lower proficiency level than the intermediate group, and in turn the intermediate group performed lower than the late bilingual group. To illustrate an example of this finding, Sattler (2008) indicated that bilingual children may portray the following communication characteristics: (1) English words may be borrowed and incorporated into the Spanish language, (2) words may be Anglicized to develop linguistic patterns, (3) trouble with the pronunciation and enunciation of words, and (4) trouble with ordering of words. Bilingual Latino children in the USA can be fluent in English and Spanish, or they can have issues with both languages. This indicates that those bilinguals who are exposed to the second language at an earlier age (i.e., children) may experience a loss of proficiency in their native language.

Studies involving the presentation of free recall lists in both languages to bilingual individuals have demonstrated that certain skills are used to organize and store verbal information and also that the skills used vary depending on the degree of proficiency (Harris, Cullum, & Puente, 1995). In a study aimed to determine the effects of bilingualism on verbal learning and memory, bilingual individuals, whom were divided into two groups based on their level of proficiency, were compared against a group of monolingual individuals (Harris et al., 1995). Individuals who were equally proficient in the oral production of both English and Spanish were identified as "balanced." Contrarily, individuals who dominated their "mother tongue," Spanish in this case, were identified as "nonbalanced." Spanish and English list learning tests were administered to both bilingual groups. Results showed that non-balanced bilingual speakers recalled fewer English words than either of the groups and retained fewer words compared to the monolingual group. Results also indicated that the balanced and monolingual group did not differ in performance. Alternatively, the balanced group, regardless of which list was presented, did not show significant differences in the amount of words recalled and retained in either language. The balanced group also demonstrated to use organizational strategies of semantic clustering in both languages.

A person's identity and perception of being bilingual or monolingual and their opinion of competencies is another domain that interacts with language proficiency. In a study conducted by Danzak (2011), six students between the ages of 11 and 14 who had moved to the USA within 2 years of the data collection were asked to write journal entries and to be interviewed in their language of choice. Results showed that social identity and literacy mutually interact with each other. Specifically, results showed that students, whom identified themselves as a bilingual identity with positive views of bilingualism, yielded fairly consistent scores across their Spanish and English writing. The term bilingual in this study was described as the following: (1) having an adequate level of oral language proficiency in both languages, (2) regularly speaking and feeling confident in both languages, (3) enjoying both languages, (4) and feeling content with being and living in the USA. Those students who identified themselves as a Spanish-speaking identity and who had negative views of bilingualism demonstrated higher qualities of writing in Spanish than English. Results of this study demonstrated that bilingual proficiency is the product of different factors such as literacy but also the individual's experience, motivation, and identity.

Cofresí and Gorman (2004) specified several recommendations when determining and assessing the proficiency of bilingualism. First, it is important to note that bilingual individuals may fall anywhere on the continuum of fluency in either of the languages spoken. Secondly, the dimension of cross-language flexibility needs to be assessed in the individual. Tertiary, one needs to determine whether cross-language priming occurs automatically or in a controlled fashion. Finally, because emotions have been shown to vary with language, assessing whether emotions are expressed more in one language than the other is helpful.

In sum, determining and assessing the degree or level of proficiency of bilingualism is a multifaceted construct that varies in levels among modalities and/or domains. Bilingualism proficiency is a construct that needs to evaluate aspects of communication in relation to the cultural and societal demands (Manuel-Dupont et al., 1992). It is a construct that involves (1) understanding, comprehending, expressing, and communicating both languages; (2) the strategies used with each language as well as (3) the skill to know when to use one of the languages and not the other; and (4) the level or degree of linguistic competence an individual controls each language.

## Measurement of Bilingualism

Although the idea that individuals who are bilingual may actually think differently and that errors would be introduced into the measurement of an unrelated domain, Padilla (1971) was the first one to actually suggest that this could actually occur. And it is not until the 1990s that individuals (e.g., Bamford, 1991; Manuel-Dupont et al., 1992) provided specifics that address the potential confounds of bilingualism on test performance. However, it is not until the last decade that actual research has been completed that addressed how this issue plays a role in assessment.

Saenz and Huer (2003) addressed the issue of bilingual children's abilities to perform on the Clinical Evaluation of Language Fundamentals and suggested that modification of existing tests needed to occur in order to reduce measurement error. Dollaghan and Horner (2011) completed a meta-analysis of the diagnostic accuracy of bilingual assessment of Spanish-English speakers, but most studies reviewed lacked good description of standard procedures and controls. Their results indicated that there is little support for the diagnostic accuracy of these measures. Cofresí and Gorman (2004) discussed the issue of biculturalism as well as acculturation in understanding bilingualism and, in turn, how these variables affected linguistic abilities in more than one language. They suggested that problems in testing include (a) conceptual equivalence, (b) construct equivalence, (c) social

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## Effects of Bilinguali

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and their opinion of coming to a study conducted by Danes in the USA within 2 years of their arrival in their language of choice with each other. Specifically, results were mostly with positive views of bilingual writing. The term bilingualism is defined as (1) oral language proficiency in two languages, (2) enjoying both languages, (3) enjoying both languages. Those students who identified themselves as bilingual demonstrated that bilingualism is not only demonstrated by the individual's experience

when determining and assessing bilingual individuals may fall into two main. Secondly, the dimension of bilingualism, one needs to determine in a well-documented fashion. Finally, because bilingualism is expressed more in

the concept of bilingualism is a multidimensional and/or domains. Bilingualism is defined in relation to the cultural construct that involves (1) understanding of two languages; (2) the strategies to use one of the languages and (3) to use an individual controls each

think differently and that error. Ardila (1971) was the first one to suggest in the 1990s that individuals (e.g., children) address the potential confound of bilingualism that actual research in the field.

individual's abilities to perform on a task. The modification of existing tests and Horner (2011) completely re-evaluated Spanish-English speakers, bilinguals and controls. Their results showed that bilinguals performed better on measures. Cofresí and Gormezano (2008) understood bilingualism as the ability to use one language. They suggested that bilingualism is a construct equivalence, (c) socio-

linguistic, and (d) appropriate assessment metric. In addition, questions of translation were raised about the standardization of tests with bilingual individuals.

## Impact of Bilingualism on Testing

As the Hispanic population increases, the need for appropriate psychological assessment instruments also increases. Currently, the testing tools available in Spanish are limited, and this is an important problem considering how fast this population is increasing. Psychological testing of Spanish speakers is a difficult task because of the linguistic and cultural diversity of this population (e.g., Ardila, 1994; Ardila, Rosselli, & Puente, 1992; Pontón & Ardila, 1999). According to the cross-cultural psychology scientific literature, the main variables that affect the performance of Spanish speakers in neuropsychological tests are (a) language, (b) education, (c) socioeconomic status, and (d) culture (Ardila, 1995; Ardila et al. 1994; Pontón & Ardila, 1999; Puente & Perez-Garcia, 2009). In addition to these variables, Puente and Puente (2009) outlined the following as the main factors to consider when assessing Spanish speakers: (a) personnel problems, (b) limited tests, (c) translation issues, (d) copyright, (e) normative sample, (f) development of new instruments, and (g) criterion validity. When testing and Hispanics in North America.

Among these variables, language, and within it bilingualism, is one of the most important to consider when testing Spanish speakers because it plays a key role in the way people interact and adapt to their cultural environment. Most Latinos in the USA are bilingual, and bilingualism can have an important impact in the outcome of psychological testing. The heterogeneity, type, acquisition, and degree of bilingualism have to be taken into account when testing a Hispanic individual.

The heterogeneity of the language is important to consider. As it was explained before, even though individuals in South America and Central America speak Spanish, they have distinct dialects. There are important differences in words, phrases, and expressions depending on the country of origin. It might be tempting to use a psychological test that was normed in Spain to assess a Puerto Rican, Dominican, or Cuban because they all have Spanish in common, but this practice could lead to error. When using psychological tests in Spanish, the country of origin of the test taker has to be considered because there are important linguistic differences within the same language and tests might not be sensitive to them. Did a study that compared the performance of Spanish-speaking individuals of four different countries (Puerto Rico, Chile, Dominican Republic, and Spain) on a battery of commonly used neuropsychological tests (Verbal Serial Learning Curve, Rey-Osterrieth Complex Figure, Verbal Phonetic Fluency Test, Stroop Color and Word Test, and the Trail-Making Test). Significant differences were found in the Serial Learning Test and the Verbal Fluency Test depending on the country of origin. The authors suggested that different language abilities may produce different results.

Also, the degree of expertise of either language varies depending on the context. For example, an individual can use Spanish to communicate with the family at home and then use English at work, making each language dominant in a particular setting. Bilingualism adds to the complexity of assessing Spanish speakers because it is important to determine the dominant language of the test taker and also the context has to be considered. Manuel-Dupont et al. (1992) conducted a study to assess the language usage patterns of bilingual Hispanics. Participants were all born in the USA since early high school; they were all well educated and learned English in school but kept using Spanish at home. They were administered the BAT English version (Paradis & Ardila, 1989), and the English-Spanish bilingualism section (Paradis & Ardila). Results indicated that participants performed significantly different in terms of linguistic skills. Cuban Americans had poorer performance in Spanish sentence

construction, number of words, morphological opposites, reading, repetition, series, semantic opposites, mental arithmetic, and dictation. In addition, fewer words, more errors, and a strong English influence were seen in the Spanish writing sample. These results can be explained by the fact that the participants learned primary literary skills in English in school because all of these areas are related to the English academic world in contrast with Spanish family world. The participants were not balanced bilinguals, and they showed strengths and weaknesses related to their linguistic and educational backgrounds.

Rosselli et al. (2002) performed a study that compared the performance of bilingual and monolingual Spanish speakers in the Stroop Test, which is a commonly used neuropsychological test. The test was administered in English and Spanish. Results showed that overall bilingual Spanish speakers performed slower than monolingual Spanish speakers in the Stroop Test, but only the difference in the color naming condition was significant. Unbalanced bilinguals performed better in their preferred language and balanced bilinguals performed similarly in both languages. Hernandez, Martinez, and Kohnert (2000) found that dominant English bilinguals performed better in English when a naming task was administered in English and Spanish.

Another study examined the effects of bilingualism on verbal learning and memory in adult Latinos. Participants were of Mexican origin and were grouped according to bilingualism type: balanced, unbalanced, and monolingual English-speaking non-Hispanics. Equivalent list learning tests in English and Spanish were developed and administered to the participants. When compared to monolinguals, nonbalanced bilinguals tested in English learned fewer words overall and obtained lower retention scores. There were no significant differences when participants were assessed in their dominant language (Harris et al., 1995).

Ardila et al. (2000) examined syntactic comprehension, verbal memory, and calculation abilities in bilingual Hispanics. All participants learned English early in life and attended English schools. In addition, for all participants L1 was Spanish. In the first study, the Spanish Syntactic Comprehension Test (Marcos & Ostrosky, 1995) was administered, and it was observed that participants comprehended the sentences better when the syntax was closer to English. Participants that learned English between 5 and 12 years of age outperformed participants that learned English before age 5. In the second study, parallel versions in English and Spanish of five subtests from the Wechsler Memory Scale (Wechsler, 1945) and the Serial Verbal Learning Test (Ardila et al., 1994) were administered. In addition, calculation ability was measured using three basic arithmetical operations and one numerical problem performed aloud in both languages. Results showed that most of the verbal memory subtests were performed better in L1. Tasks that measured speed and calculation accuracy were performed better in the participant's native language. The language that was spoken the best was a significant variable in some subtest performed in English, but not in Spanish. These results suggest that Spanish-English bilinguals may be at a disadvantage when tested in either language (Ardila et al.). In another study, English semantic and letter fluency tasks were administered to English-dominant bilinguals and English monolinguals. Bilinguals performed worse than monolinguals in both category types (Gollan, Montoya, & Werner, 2002).

Gasquoin, Croyle, Cavazos-Gonzalez, and Sandoval (2007) conducted a study that assessed the performance of adult bilingual Hispanics on neuropsychological test battery administered in English and in Spanish (Bateria Neuropsicologica and the Matrix Reasoning subtest of the WAIS-III). Participants were divided into Spanish-dominant, balanced, and English-dominant bilingual groups. Spanish- and English-dominant bilinguals were significantly affected by language of administration in tests with higher language compared to visual perceptual weighting (Woodcock-Munoz Language Survey-Revised, Letter Fluency, Story Memory, and Stroop). Language of administration did not affect the performance-balanced bilinguals. As it would be expected, the results of these studies suggest that a bilingual that is dominant in a specific language will perform better if the test is in the

language of dominance; how

languages.

Roberts, Garcia, Desroche, and others (2008) examined the Boston Naming Test (English-English) that learned English as a second language were significantly lower. These results challenge claims to be proficient in both languages. Another study examined the performance of Hispanics. It was observed that they, where they scored lower on the free spontaneous fluency test, free spontaneous fluency test, and produced fewer words than bilinguals that learned English as a second language to determine the optimal language for bilinguals. Word recognition, language acquisition, length of language dominance were taken into account. Those that learned English as a second language. In contrast, bilinguals that learned English and in Spanish performed better on tests with higher language. The effects of bilingualism on neuropsychological Screening Test were 300 Latinos grouped by language. The participants were matched by age and gender. Results indicated that language of administration (Digit Span, Digit Symbol, and Raven's Standard Progressive Matrices) was a significant variable; nevertheless, it was not significant when they were not matched by language, especially when the test was in both languages (Bialystok & Kover, 2007). It seems to involve executive functions in tasks that involve executive functions. A negative effect against Alzheimer's disease. Lust (2011) found that bilinguals performed better than monolinguals. Lust et al. (2008) presented the limitations of bilingualism. There are some advantages in inhibitory control. The difficulties of understanding the issue of bilingualism (2011). They recently found that bilingual individuals is fraudulent. The issue of appropriate caution

5, repetition, series, semantic fluency, and more errors, and a similar pattern of results can be explained by the fact that participants in school because all of them were from a Spanish family world. The pattern of results and weaknesses related to the tests used.

ance of bilingual and monolingual groups in a neuropsychological test. The results of the overall bilingual Spanish speaking group were not different from the monolingual group, but only the difference in the tests where they performed better in their preferred language. Hernandez, Martinez, and others (2008) found that bilinguals performed better in English when a naming test was used.

ng and memory in adult Latin Americans. The results of the bilingualism type: balanced bilinguals performed better in English than monolinguals in all and obtained lower retention scores when assessed in their dominant language.

mory, and calculation abilities were assessed. Participants who attended English schools performed better on the Spanish Syntactic Comprehension Test. Participants that learned English before age 5. In the Wechsler Memory Scale (Wechsler, 1994) were administered. The results showed that most of the verbal memory and calculation accuracy were better when the test was in Spanish. These results suggest that bilinguals performed better in either language (Aguilar et al., 2008). When administered to English speakers, bilinguals performed worse than monolinguals.

ducted a study that assessed the effects of bilingualism on a battery administered in English. The results of the naming subtest of the WAIS-III showed that bilinguals performed better in English than monolinguals. The results of the English-dominant bilingual group were not different from the monolingual group by language of administration. The results of the Spanish-dominant bilingual group were not different from the monolingual group by language of administration. The results of these studies suggest that bilinguals perform better if the test is in their dominant language.

dominance; however, balanced bilinguals seem to be able to perform similarly in both languages.

Garcia, Desrochers, and Hernandez (2002) conducted a study on the effects of bilingualism on the Boston Naming Test. There were two groups of bilingual participants (Spanish-English and English-Spanish) that learned English as a second language since childhood and reported being proficient in the language. Compared to monolingual participants, bilinguals performed better on the test. These results suggest that English norms should not be used, even when the individual is proficient in English.

A study examined the impact of bilingualism on verbal fluency and repetition skills in older adults. It was observed that bilinguals scored equally in all tests, except for semantic verbal fluency where they scored lower compared to Spanish and English monolinguals. Phonetic verbal fluency, and repetition of sentences were not affected by bilingualism. Bilinguals who learned English at an earlier age performed significantly better on English tests and produced a higher number of words in the description of a picture compared to those who learned English later in life (Rosselli et al., 2000). Shi and Sanchez (2010) conducted a study to determine the optimal language that should be used in speech perception tests with Spanish-English bilinguals. Word recognition tests were administered in English and Spanish, and age of acquisition, length of immersion, daily language use, self-rated listening proficiency, and language dominance were taken into account. Results suggested that Spanish-dominant bilinguals or those who learned English after age 10 would perform better in a word recognition test administered in Spanish. In contrast, bilinguals who learned English between 7 and 10 years of age should be evaluated in both English and in Spanish. In sum, it seems that the earlier the second language is acquired, the better the performance on tests will be because the individual will be more proficient in that language.

The effects of bilingualism in neuropsychological testing were examined using the Neuropsychological Screening Battery for Hispanics (NeSBHIS, Pontón et al., 1996). Participants were grouped by language of choice. There were 82 bilinguals and 218 monolinguals. Participants were matched by education, and this created a third subsample of 145 participants. The results showed that language of choice plays an important role in measures of mental control/attention (Digit Span, Digit Symbol, Color Trails I and II) and abstract nonverbal reasoning (Block Design, Standard Progressive Matrices). These findings suggest that bilingualism impacts test performance, nevertheless, in this study, bilingual participants tended to perform better on most measures when they were matched by education. Bilingualism can have a positive effect on cognitive performance, especially when the person is well educated and has the same degree of mastery in the two languages (Bialystok & Cummins, 1991). The main effect of bilingualism on cognitive performance is to involve executive control; bilingual individuals consistently outperform monolinguals on tasks that involve executive control. Moreover, there is evidence for bilingualism having a protective effect against Alzheimer's disease (Bialystok, 2011). In line with these results, Yang, Yang, and others (2011) found that bilinguals had an advantage in attention and executive function when compared to monolinguals.

Yang et al. (2008) presented the positive and negative effects of bilinguals. For example, they found the limitations of vocabulary size in bilinguals which could produce error in language tests. There are some advantages, according to the authors, of having a bilingual brain. These advantages are in inhibitory control and executive function even in adults.

The difficulties of understanding the assessment of bilinguals are probably best stated by Garcia and others (2011). They recently suggested that over the last 100 years, the measurement of intelligence in bilingual individuals is fraught with error. Such errors are particularly likely to be present with emergent bilinguals. The issue of appropriate measurement of a construct was once more addressed with the suggestion that extreme caution should be taken when measuring intelligence in bilinguals.





in terms of cognitive functions, this deficit evolves and it indicates that as development of bilingualism is either a detriment or a potentiating effect on cognitive functions.

Bilinguals can and do exist. The differences between the two groups are very difficult to be balanced. The more descriptive of emotions. Further, the order of if a person learns Spanish first, but in reality, there is a balanced bilingual could use such strategies could be the ones who learn English secondly result in a reduction of standardized tests). Hence, one is "cognitively limited" when in a person's abilities as well

It is clear with what one is learning languages, like possibly failing to understand that more sensitive to technical bilingualism is only the beginning of what the construct in supersede the careful meaning and emotional ones (where it is).

In strictly bilingual assessment is being measured may understanding biculturalism is critical. Similarly understanding how being addresses how individuals take tests. And when this is during early development initial disability eventually

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