Bilingual Processing and Acquisition 15

Introduction

Language acquisition, competence and performance

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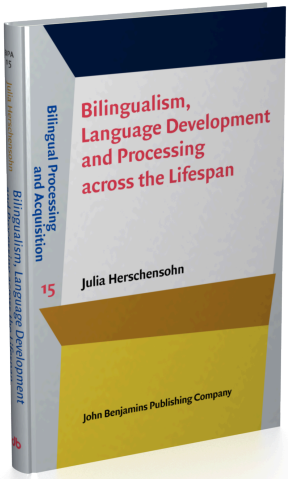

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Introduction

Language acquisition, competence and performance

0.1 Bilingual lexico-grammatical knowledge and its implementation

How does knowledge of a first or second language develop, and how is that knowledge used in real time comprehension and production of one or two languages? Bilingual development and processing are the central topics that this book explores, initially in terms of first language(s) (L1s) and then in terms of additional languages. Human growth and development necessarily involves the passage of time, implicating this orthogonal factor and leading to the observation that capacities may vary across the lifespan. Two theoretical frameworks have historically attributed explanations for knowledge and use of language, *nature* versus *nurture* approaches (Galton 1876): the former credits biogenetic intrinsic characteristics, while the latter ascribes environmental extrinsic experiences as the causes of developmental change. The evidence examined throughout this book will lead to a more nuanced and complex view, eschewing dichotomy and favoring a hybrid approach that takes into account a range of internal and external influences. Indeed, "development cannot occur without both of them, and nature changes as a result of nurture and nurture is modified as a result of nature" (Shulman 2016, 75; see also Resende 2019).

Bilinguals show varying profiles depending on when and how the two languages are acquired (language acquisition, LA; see De Houwer 2021 for discussions of child LA). The terms development, acquisition and learning are usually used interchangeably in this book and include "both instructed and uninstructed, both implicit and explicit" (De Houwer & Ortega 2019b, 2). A first profile that is examined is that of simultaneous bilinguals who learn two languages from birth (2L1A) and may be referred to as *crib bilinguals*. Children who receive substantial input from both languages and comparable access to educational opportunities in both reach adulthood with solid proficiency in both languages, often deemed *balanced* competence. However, the two languages of a bilingual are never completely equal or balanced (De Houwer 2018a,b; Grosjean 2008), so the term (although broadly used) is not really accurate. A second profile to be studied is that of young children who acquire a second language from three to six years of age (cL2A) after mastering core features of their L1; such individuals are often described as *early sequential*

childhood bilinguals, a moniker also used here. De Houwer (2021) also uses these same cut-offs in her descriptions of child bilingualism: Bilingual First Language Acquisition (BFLA, from birth), Early Second Language Acquisition (ESLA, from preschool through age six) and acquisition during middle childhood (SLA, elementary school through age eleven). In this book, the term sequential early child bilingual refers to learners whose AoA is three to six years, generally excluding late childhood L2 acquisition (seven to twelve years) which "spans the elementary school years" (Montrul 2008, 17). Many investigations, however, group together such sequential child learners with crib learners as "early" bilinguals; the book aims to point out this ambiguity in citing research.

The final bilingual profile to be explored in this book is that of adult learners (aL2A) who begin their acquisition of L2 after L1 mastery and after most cognitive maturation; they are often labeled late bilinguals in psycholinguistic literature, which frequently uses college age individuals as sources of aL2 data. In terms of sequential learning, the first language designated is the L1, as Russian for Russian-English bilinguals. Traditionally, first language learners are referred to as *native speakers*, a term that has received a large degree of criticism (Dewaele, Bak & Ortega 2021; Swan et al. 2015), particularly for perpetuating Eurocentric models and implying "a cultural deficiency derived from non-Western stereotypes" (Holliday 2015, 11). Furthermore, all (native) monolinguals do not show equivalent capacities in their knowledge and use of language (Dąbrowska 2018), as this book will also demonstrate, given that individual differences exist in a range of linguistic and cognitive capacities. The term native has, however, been used for decades, especially in aL2 studies, which have repeatedly used "native proficiency" as a benchmark for language competence. The term is avoided when possible, but many reports cited in the book use criteria based on native perceptions or native speaker judgements.

In order to consider the topics outlined above, one must examine the factors that influence how individuals gain linguistic knowledge and the capacity to put it in action, elements related to language acquisition per se and the development of language processing (Ambridge & Lieven 2011; De Houwer & Ortega 2019a; Granena & Long 2013; Hagoort 2019; Schwieter 2015). These components include age and environment of acquisition, quantity and quality of input and individual characteristics such as memory and motivation (Altarriba & Isurin 2012; Armon-Lotem & Meir 2019; Arnon & Clark 2011; De Houwer 2018a,b; Grüter & Paradis 2014; Silva-Corvalán 2014). Furthermore, characteristics of the languages themselves (e.g. composition of sounds or regularity of morphosyntax) and the genetic relationship of the two tongues may also impact development and implementation. Acquisition and processing studies employ a range of methodologies to tap knowledge in traditional ways – such as analysis of language production and test results that reveal linguistic competence – or in real-time methodologies measuring

reaction time and using techniques that monitor brain responses (Dörnyei 2009; Schwieter 2019; Spivey, McRae & Joanisse 2012). Since language knowledge and its implementation in processing are primarily functions of cerebral storage and use, the role of the brain in the current investigation cannot be overemphasized. A genetic predisposition readies infants to selectively perceive their environment, creating linguistic networks in their young minds that will mature into the rapid processing systems of adult speakers. Language knowledge and its implementation are inextricably linked in development and in ongoing use, as the empirical evidence examined in this book will demonstrate.

The research selected to make comparisons among the four profiles includes four areas of lexico-grammatical competence, *phonology* (sounds), *lexicon* (vocabulary), *morphology* (verbal and nominal agreement) and *syntax* (word order, pronouns). These areas are illustrated mainly with Indo-European language data, since those languages have been most amply documented, but not every profile is equally represented in the psycholinguistic literature. Within each field, there are specific areas of investigation that have been surveyed for every profile and in both child and adult learners. For example, in phonology voice onset time (VOT) has been measured for monolinguals and for every bilingual population; in lexical studies word retrieval has been broadly explored; in morphology nominal gender-number agreement and subject-verb agreement have been examined in several Indo-European (I-E) languages; and in syntax, object clitic pronouns have been scrutinized in Romance languages for all the learner profiles. Morphology and syntax actually form a co-dependent continuum, especially in I-E languages, so these structural divisions are more reflective of the preponderance of research on European languages than of an equitable look at all world languages and at all areas of language knowledge. The comparisons of these common themes are complemented by investigations into additional topics such as vowel production and grammatical case that may not be consistently available for each profile. The following section introduces the main themes outlined in the seven chapters of the book.

0.2 Summary of chapter contents

The first chapter introduces the central issues of language knowledge and processing. The first section presents the theoretical debate in cognitive science between Nature and Nurture, domain-specific nativism/ modularity and domain-general emergentism/ connectionism. It presents compromise views, coalition approaches that favor multifactor influences rather than a single factor, as comprehensive theoretical frameworks in which to ground the current research. It defines basic terms, establishes the neurological basis of human language and describes basic

architecture of the brain. It ends with a discussion of sensitive periods and the importance of age of acquisition onset (AoA) for bilingual profiles.

In order to approach the role of language knowledge and processing, Chapter Two first presents the components of language, the phonology (sound system), lexicon (vocabulary), morphology (mainly Indo-European nominal and verbal agreement) and syntax (e.g. word order), the four linguistic subsystems that are examined in the subsequent chapters. It then discusses the neurological and physiological components of speech perception and production. Finally, it gives an overview of psycholinguistic and neurolinguistic processing research methodologies, discussing both behavioral techniques and electrophysiological and neuroimaging procedures.

Chapter Three establishes benchmarks of monolingual language acquisition and processing in examining evidence from psycholinguistic studies of speakers who know a single language. Using developmental studies as a point of departure, it traces each linguistic subfield from its acquisition during infancy, through its function in childhood and to its manifestation in adult speakers. It thus gives an overview of the schedule, manner and end result of monolingual acquisition. The growing literature on babies provides information not simply on how young children respond to linguistic input, but also how their eventual adult competence develops during an early period. Structural differences, such as number of dedicated neural networks, in child and adult brains reveal how maturation is reflected in performance distinctions.

Chapter Four examines dual language acquisition by simultaneous crib learners who receive sufficient input and literacy skills throughout their lifetime to retain bilingual proficiency as adults. These learners are exposed to the two languages from birth (Meisel 2008, 2011) and acquire both in parallel. They are described using acquisition as a beginning point, sketching each linguistic component – phonology, lexicon, morphology and syntax – from infancy through adulthood for either one or both of the languages. Similarities and differences are noted, when evident, between the simultaneous and monolingual learners, between child and adult versions of this profile.

Chapter Five investigates language acquisition by sequential child bilinguals (age three to six), mainly excluding late (age seven to twelve, Montrul 2008) child learners. The sequential bilinguals may be fairly symmetric in their bilingualism, or they may be asymmetric in their command of each language in either showing differential competence in the second or in attriting the first language as the second one becomes dominant. The chapter explores knowledge and processing in sequential learners in each linguistic subfield and compares competence in the two languages in these bilinguals who may show differential mastery. Both simultaneous and sequential learners are vulnerable to multiple factors resulting in asymmetric

mastery. Heritage language learners, whose L2 becomes the dominant language may display differential mastery of their languages. Research on heritage language speakers has generated substantial discussions concerning social, educational and linguistic issues that are reviewed here (Ortega 2020).

The sixth chapter looks at experimental studies of aL2A. Some research points to a fundamental difference between child and adult acquisition of phonology and morphosyntax related to AoA of the L2 (Bley-Vroman 1990; Meisel 2011; Scovel 1988). In contrast, several studies of ultimate achievement confirm that adult L2 learners can be qualitatively proficient in their mastery of syntax, morphology and the lexicon (Birdsong 1999a,b; Granena & Long 2013).

Chapter Seven first looks at language and cognition in mature bilinguals and then evaluates arguments for and against a bilingual advantage in cognition. The pros and cons of a bilingual advantage leave the question open for further exploration. The next section reconsiders the theoretical approaches considered and notes the constellation of factors both internal and external that contribute to language knowledge and processing. It finally reviews these factors to give comprehensive answers to the research questions.