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## CONCEPTUAL REVIEW ARTICLE

# An Individual-Differences Framework for Comparing Nonnative With Native Speakers: Perspectives From BLC Theory

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This article proposes basic (shared) and extended (nonshared) language cognition in native speakers as a function of two types of extralinguistic attributes: (a) degree of being multilingual and (b) variables related to amount and type of literacy experiences (e.g., level of education). This approach may throw new light on the question of whether bilinguals can attain complete or native proficiency in two (or more) languages and the question of whether both early and late second language (L2) learners can attain native levels of L2 proficiency. An adequate language acquisition theory should explain why some structures are and some other structures are not comprehended and produced by all native speakers and also describe the acquisition over time (development) of lexical-grammatical structures comprehended or produced by all native speakers or only by some. It is argued that usage-based linguistics stands a better chance of accomplishing this task than generative linguistics.

**Keywords** bilingualism; (near)nativeness; basic language cognition (BLC); literacy; usage-based linguistics; generative linguistics

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## Introduction

The notion of native speaker lies dormant in most of the literature on second language acquisition (SLA) and bilingualism, with (at least) two exceptions. These exceptions concern two questions, intriguing and challenging for theories of language acquisition:

Q1. Is it possible for a bilingual or multilingual person to attain so-called complete or native proficiency in two (or more) languages?
Q2. Is it possible for both early and late second language (L2) learners to attain so-called native levels of L2 proficiency?

To quote Birdsong and Gertken's (2013) lucid treatise on the topic, comparing native speakers with nonnative speakers is "not invariably a fool's game" (p. 108). According to Birdsong and Gertken, "The benefits of such comparisons include learning about natives and about nativelikeness, the prompting of complementary approaches, and the straightforwardness and heuristic values of the method" (p. 127).

This theoretical article presents a framework for the study of individual differences in adult native speakers. The framework may help answer the two questions in a rational, well-structured manner. The claim, based on some (but not massive) empirical evidence, is that there exist enormous differences among adult native speakers in their control of their native languages (see Dąbrowska, 2012a; Mulder & Hulstijn, 2011; and Hulstijn, 2015, Chapter 6, for reviews). Answers to the two questions cannot be found unless an individual-differences approach is adopted. As Kidd, Donnelly, and Christiansen (2018, p. 154) noted, "Despite their ubiquity, IDs [individual differences] represent something of an inconvenient truth: their presence is undeniable but our theories and experimental methods overwhelmingly downplay their importance (e.g., by relegating them to error variance)." The framework is partially based on Shared/Basic Language Cognition (BLC) Theory, that is, the theory of basic linguistic cognition, the knowledge that is shared by all adult native speakers of a language (Hulstijn, 2015).

This article is structured in the following way. First, an overall picture is given of the framework and its components. Then follow three subsections devoted to each of the components. The following two sections show how the framework can be used as a *research agenda* to help answer the question concerning complete/native bilingualism (Q1) and the age question in L2 acquisition (Q2). The next section delves deeper, addressing generative versus usage-based explanations of first language (L1) and L2 acquisition underlying Q1 and Q2. The article is rounded off with a summary and conclusion.

In this article, the terms native speakers (L1ers) and nonnative speakers (L2ers) are used to refer to people growing up with one or more languages from birth (native speakers/L1ers) or to people acquiring a language sooner or later after that point in life (nonnative speakers/L2ers). Some researchers reject the use of the terms native speaker and nonnative speaker on various grounds, ranging from practical considerations to considerations of banning racism (see Dewaele, 2017, for an overview of views, including his own critical view). I do not intend to antagonize these researchers, but in the academic literature on linguistic/cognitive aspects of SLA and multilingualism, the terms are still in use in the neutral sense mentioned. In the remainder of this article, the terms L1er and L2er will be used where possible, but where confusion might arise, including the title, the terms native and nonnative speakers will be used.

## The Framework

### The Framework's Essence

The first step in addressing the matter of native/nonnative comparisons is to deconstruct the notion of native speaker (note that all types of native speakers referred to in this article are restricted to adult individuals not affected by language-related disorders). First, following Escudero and Sharwood Smith (2001), I propose to distinguish between a linguistic definition of the native speaker and a definition in terms of extralinguistic attributes. Second, I propose two ways of defining native speakers in terms of language cognition (see next subsection), namely in terms of shared/basic language cognition and nonshared/extended/higher language cognition. Third, I propose two ways of defining native speakers in extralinguistic terms (in the two subsequent subsections), namely, along (a) the biographical/ecological dimension of degrees of being bilingual and (b) the dimension of literacy. The basic idea underlying the framework is that differences in native speakers' language cognition be conceptualized and studied *as a function of* native speakers' memberships along the extralinguistic dimensions (Figure 1). A key feature of the framework is that the extralinguistic dimensions be disentangled even though associations between them should not be ruled out.

### The Notion of Shared Language Cognition in Native Speakers

This subsection outlines a way of characterizing native speakers in linguistic terms, using BLC Theory (Hulstijn, 2011, 2015), which distinguishes between shared/basic language cognition and nonshared/extended/higher language cognition.[1] BLC refers to the language cognition in the oral domains (comprehension and production of speech) that is acquired and thus shared by

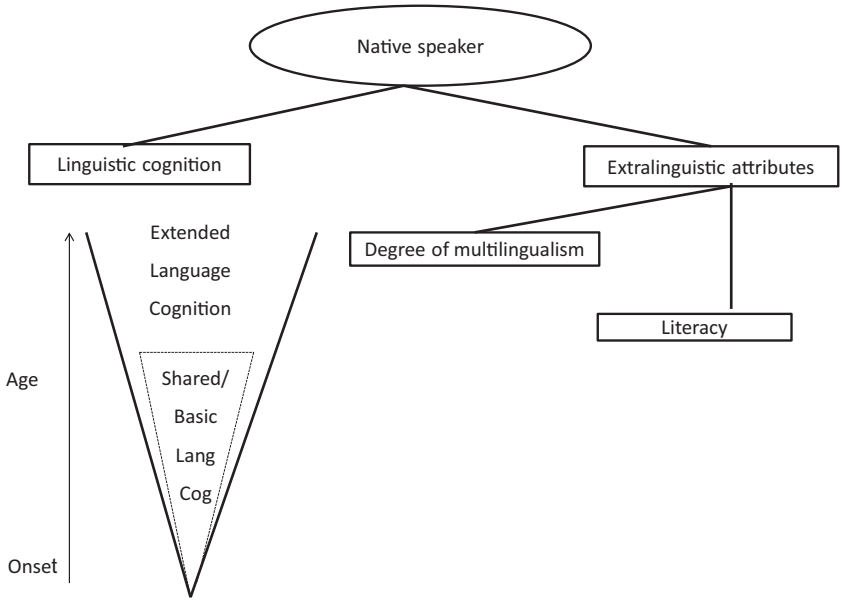


**Figure 1** The framework of linguistic cognition (extended versus shared/basic language cognition) and extralinguistic attributes. Language development, as indicated by the arrow at the left, is rendered vertically, from bottom to top. There is no lid on the cone to indicate the impossibility of defining maximal language cognition. Language attrition is not visualized in this figure.

all adult native speakers. Note that BLC and oral language are not synonymous; neither are extended language cognition and written language (Hulstijn, 2015, Chapter 3).

Extended language cognition is the domain of oral and written language use where differences between native speakers can be observed, that is, language cognition not acquired or shared by all native speakers. In Hulstijn (2015, pp. 22–24), it is suggested that the lexical and grammatical (morphological and syntactic) inventories of a language map onto a Zipfian distribution with a minority of lexical units and grammatical constructions occurring frequently in corpora of spoken language (the steep part of the distribution curve of raw frequencies) and the majority of lexical units and grammatical constructions occurring infrequently (the long flattening asymptote of the distribution curve). While extended language cognition pertains to the infrequent units and constructions, BLC pertains to the frequent units and constructions. Figure 1 renders language acquisition (along the vertical axis from bottom to top) as the

acquisition of elements of BLC (acquired by all native speakers) and elements of extended language cognition (not acquired by all native speakers).

The reason for using the term cognition in BLC Theory is that cognition purports to refer to both representation and processing of linguistic information (Hulstijn, 2015, p. 22).[2] A comprehensive definition of BLC reads as follows:

> BLC pertains to (1) the largely implicit, unconscious knowledge in the domains of phonetics, prosody, phonology, morphology and syntax, (2) the largely explicit, conscious knowledge in the [lexical-pragmatic] domain (form–meaning mappings), *in combination with* (3) the automaticity with which these types of knowledge can be processed. BLC is restricted to frequent lexical items and frequent grammatical structures, that is, to lexical items and morphosyntactic structures that may occur in any communicative situation, common to all adult L1ers, regardless of age, literacy, or educational level. BLC is restricted to speech comprehension and speech production; it does not comprise reading and writing. (Adapted from Hulstijn, 2011, pp. 230–231; see also Hulstijn, 2015, p. 42)

In line with a tradition in linguistics going back to American and European structuralism (Bloomfield, 1933; De Saussure, 1916), I regard the comprehension and production of speech as a more fundamental human attribute than literacy skills. As Biber (1988, p. 8) stated, "All cultures make use of spoken communication; many languages do not have a written form. From a historical and developmental perspective, speech is clearly primary." In a similar vein, Pawley and Syder (1983, p. 569) spoke of "the primacy of vernacular syntax" as opposed to the syntax of "literary discourse."[3]

In an insightful paper on the grammar of spoken English, Leech (2000) referred to a book-length study of the syntax and discourse of extemporaneous speech, written by Miller and Weinert (1998). These researchers argued that the contents of published dictionaries and grammars represent "magnavocabulary" and "magnasyntax" (Miller & Weinert, 1998, p. 376). Magnavocabulary and magnasyntax "is not the property of any one speaker" (Miller & Weinert, 1998, p. 376). For many languages and countries, magnasyntax is the Standard Language (Davies, 2013) as described in published grammars. Many L2 learners pursue the ideal of the codified Standard Language, regardless of the question of whether this ambition is realistic or not in their particular case.

Miller and Weinert used the term "core" for "the syntax and vocabulary typically used and understood by children at certain ages" (1998, p. 407). The authors argued:

> This notion of core is based on frequency as well as simplicity . . . . We could say that the core consists of all constructions and vocabulary found in the informal speech of teenage pupils—say age 16—or of adults who have no higher education . . . . [I]t is clear from existing corpuses that there is a shared body of syntax whose properties can be specified in terms of degrees of clause embedding, degree of clause combination, proportion of finite subordinate clauses to main clauses, absence of certain constructions. (1998, p. 407)

Thus, Miller and Weinert's core comes close to Hulstijn's notion of shared/basic language cognition[4]; the quotations given above show that both sources spoke of "shared" cognition. In a similar vein, Lightbown and Spada's (2006, p. 202) definition of native speaker includes a reference to a shared core: "Native speakers ( . . . ) tend to agree on the basic grammar of the language." Gleitman and Gleitman (1970, p. 182) distinguished "core grammar" from "penumbral grammar," where core grammar is shared by all native speakers. Ellis (2012, p. 266) noted that native speakers "have converged on, if not the identical same grammar, a similar-enough core language system."

Arguably, the study of shared language cognition is simultaneously and necessarily the study of individual differences. BLC Theory breaks down, as it were, homogeneous conceptualizations of the notion of native speaker: "'the' native speaker does not exist, except that all native speakers share BLC" (Hulstijn, 2015, p.28).

### The Biographical–Environmental Dimension of Degrees of Multilingualism

This subsection presents the first of two ways of characterizing native speakers in extralinguistic terms, pertaining to degrees of multilingualism. While all native speakers have in common that they started to acquire the native language(s) from birth, various types of native speakers can be discerned along a biographical–environmental dimension (or scale) of degrees of being multilingual (Figure 2).

At one extreme, we find the native speaker who maintains the language into adulthood, remaining completely monolingual (i.e., zero multilingualism). (Although reliable statistics are lacking, it seems to be safe to state that in most countries high school students are taught at least one foreign language and that thus the number of monolingual adult native speakers of almost all languages is currently decreasing rapidly.) At the other extreme, we find the native speaker who acquires two languages from birth and maintains the use of

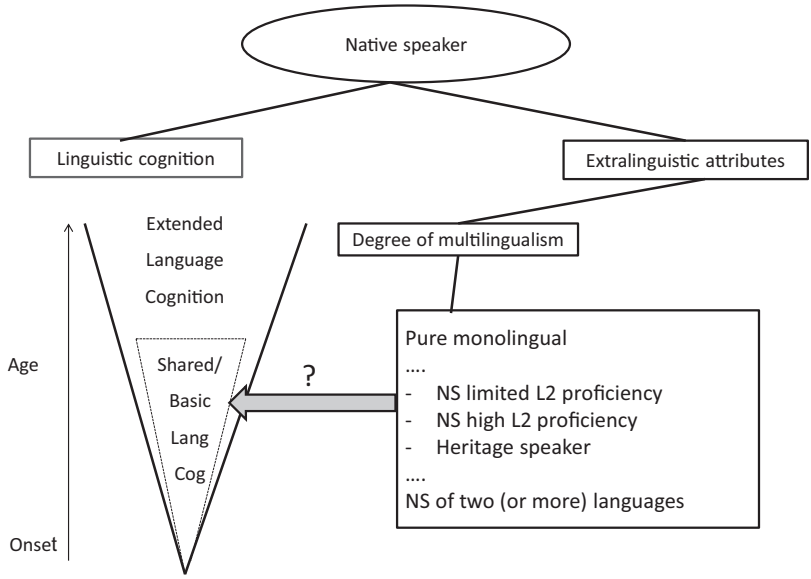


**Figure 2** Does shared language cognition vary by native speaker (NS) type?

both into adulthood (simultaneous bilingualism). In other words, such a person is a native speaker of more than one language. In between these poles, other types of native speakers can be distinguished using various biographical and environmental variables, for example, (a) native speakers acquiring one or more nonnative languages later in life, but only to a limited extent (e.g., not being able to carry a conversation in these languages); (b) native speakers acquiring one or more nonnative languages, attaining a high level of proficiency; or (c) heritage speakers, who grow up with one or more L1s at home before school age, acquire another language later and become more proficient, even dominant, in the latter language. (See Treffers-Daller, 2016, for an overview of various definitions and operationalizations of the construct of language dominance.) Thus, heritage speakers are native speakers of their heritage language(s) (cf. Rothman & Treffers-Daller, 2014) but different from other native speaker types along this dimension.

Recall that the basic idea of the proposed framework is that differences in native speakers' language cognition be conceptualized and studied as a function of their memberships along the two extralinguistic dimensions. With respect to the first extralinguistic dimension, then, the framework generates the following research agenda: For each of the types of native speakers, establish the

contents of its shared/basic language cognition and then compare these contents across native speaker types. The advantage of this differential approach is that cross-type comparisons are addressed, first and foremost, with respect to oral language cognition shared by all speakers within each type, excluding within-type individual differences (nonshared language cognition). This allows for a rational, empirical approach to the question of whether or not it is important to distinguish (include or exclude) different types of native speakers in the study of native/nonnative comparisons (cf. the quotation from Birdsong and Gertken, 2013, in the introduction of this article). This matter will be discussed in more detail in the sections showing how the framework can be used as a research agenda to help answer the question concerning complete/native bilingualism (Q1) and the age question in L2 acquisition (Q2).

**The Literacy Dimension**

This subsection presents the second way of characterizing native speakers in extralinguistic terms. Along this dimension, native speakers can be distinguished in terms of attributes potentially related to amount and types of literacy experiences, that is, native speakers differing in age, socioeconomic status (including level of education and profession), language-related leisure-time activities, and perhaps even verbal and nonverbal intelligence, and working memory capacity (Figure 3). Several of these attributes, such as intelligence, working memory capacity, and level of education are likely to be correlated among themselves. This matter is not further pursued here, but see Carroll (1993) for a monumental documentation of studies on cognitive abilities and their components.

In modern societies with compulsory education for all children, all children (without language-related disorders) learn to read and write in elementary school. They all become literate, at least at a basic level. But in their school years and later in life, they do not all read and write to the same extent. Many so-called a-literate people avoid reading and writing of texts longer than a few lines, for example, in social media (Cumming, 2012; van Kruistum, Leseman, & de Haan, 2014). Nor do people read and write the same genres of text (depending on level of education, profession, and leisure-time activities). Therefore, it may well be that native speakers' linguistic repertoires differ substantially, not solely in terms of, for example, vocabulary size and their control of morphosyntax but also in terms of their control of genres and subgenres of oral and written discourse (Biber, 1988; Hemphill, 2011). In an authoritative paper, Wells (1986) assigned the concept of variation a place equally central to our understanding of language development and language use as the concepts of regularity and universality, with variability produced by social background, personal attributes

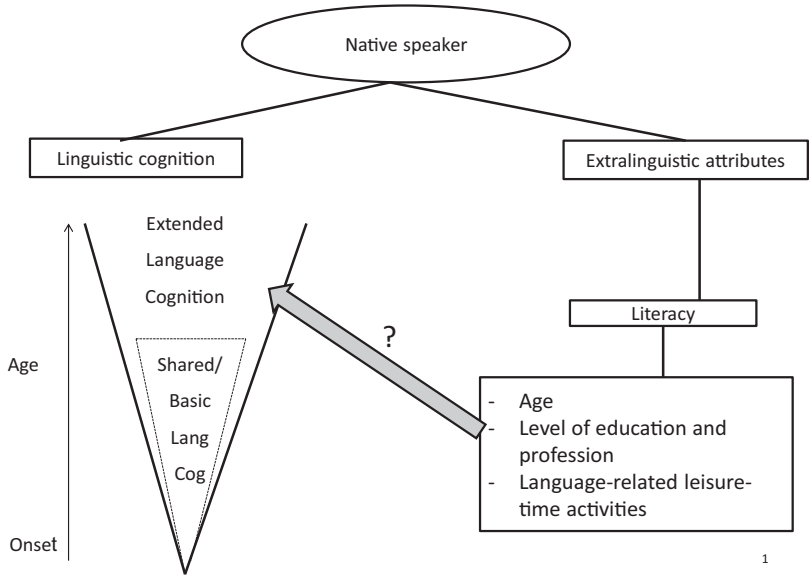


**Figure 3** To what extent does extended language cognition vary as a function of literacy-related variables such as age, education, and leisure-time activities?

(e.g., gender, intelligence, personality, and learning styles), situation (e.g., setting, activity, number and status of participants), and style of interaction (e.g., interpersonal relations, child-rearing methods). For an overview of the rather modest literature on individual differences in L1 proficiency in adolescents, see Berman (2007) and Nippold (2006). For individual differences in adults, see Dąbrowska (2012a) and Hulstijn (2015, Chapter 6). Most of the evidence for individual differences comes from research in clinical linguistics, ageing, or mental disorders. For studies in these areas, normative data are elicited from people not affected by cognitive impairment in tasks such as word list recall, picture naming, picture description, and tests of vocabulary size (see Hulstijn, 2015, pp. 63–67, for a summary of the findings).

## An Illustrative Study

In a study that aimed at exploring individual differences in adult native speakers of Dutch in a variety of tasks, Mulder and Hulstijn (2011) administered four speed tasks (word association, auditory and visual lexical decision, and picture naming), a paper-and-pencil productive vocabulary test, two short-term memory tasks (auditory and visual word span), and four speaking tasks to a

sample of 98 adult native speakers of Dutch, differing in age (18–76 years) and level of education/profession (EP; ranging from a housewife who attended only elementary school to a lawyer with a law school degree). Lexical fluency was affected by Age but not by EP: Older subjects responded more slowly than younger subjects. However, older subjects did not perform more poorly than younger subjects in the four speaking tasks. Lexical memory in the aural mode was associated with both Age and EP, favoring the younger and more highly educated participants; in the visual mode, significant effects were obtained for Age and the Age × EP interaction. Vocabulary knowledge increased with Age and was higher in the high-EP group than in the low-EP group. In the highly demanding speaking tasks, participants with higher EP were more successful in conveying their messages than participants with lower EP. High-EP subjects talked longer, produced more words and T-units and made fewer grammatical errors than low-EP subjects. However, EP was not found to be associated with number of words per T units, lexical richness, or hesitations per T-unit. These statistical effects of EP support the idea that the real factors underlying individual differences are the quantity and quality of language use in a variety of settings, involving a variety of oral and written discourse, as has been suggested by MacDonald and Christiansen (2002) and referred to by Dąbrowska (2012b) and Andringa, Olsthoorn, Van Beuningen, Schoonen, and Hulstijn (2012).

In additional analyses of some syntactic structures produced in the four speaking tasks, Hulstijn (2017) observed that relative clauses, fronted conditional clauses with *als* ("if") and the passive voice, were used by a large majority of both EP-High and EP-Low subjects. In contrast, prenominal participle phrases (preceding the head noun of a noun phrase), *het* ("it")-cleft sentences, or fronted subject or object clauses were not, or hardly, produced in neither EP-High or EP-Low subjects, suggesting that such constructions are either not present at all or weakly entrenched in most L1ers' grammars; experimental research is needed, however, to verify this suggestion.

In research comparing nonnative with native speakers, addressing the question concerning complete/native bilingualism (Q1) and the age question in L2 acquisition (Q2), it would be mandatory to take literacy-related variables into account. Recall that BLC is by definition invariant across individual native speakers in adult native speaker populations. Thus, no association can exist between BLC on the one side and any of the literacy-related variables on the other side, that is, in adults who already acquired BLC. While variables such as intelligence, working memory capacity, and parents' education have been shown to be associated with the speed with which children acquire their L1, BLC Theory holds that variables such as these are no longer associated with

BLC once acquired, that is, in adults not affected by language-related cognitive impairments. The framework thus generates the empirical question: To what extent are individual differences in personal attributes underlying literacy experiences associated with individual differences in nonshared/extended/higher language cognition? If such associations were to be found, how should they be explained?

## Using the Framework in the Study of Complete or Native Bilingualism

This article began with two questions pertaining to so-called complete or native control of two languages (Q1) and to ultimate attainment in early and late L2 learners (Q2). A framework was presented for the study of individual differences in adult native speakers with which researchers should be able to address these two questions in a rational, well-structured manner by distinguishing two domains of language cognition and various ways of characterizing native speakers extralinguistically. The basic idea is to investigate whether any associations exist between native speakers' language cognition and their extralinguistic memberships. The final step in the deconstruction process might be, if a given study's research question so required, to remove the predicate native and nonnative altogether and investigate associations between people's language cognition and their extralinguistic memberships. (Recall that nonnative speakers are also native speakers of their L1.) This might (but need not) include studies designed on the basis of Cook's (2012, 2016) notion of multicompetence or of Ortega's (2013, 2016) call for a bilingual–multilingual turn in the study of SLA and bilingualism.

The question of whether one can attain full, complete, or native control in two (or more) languages is relevant in at least two ways. First, the question has been raised, and still is being raised, by generation after generation of nonlanguage specialists, such as parents considering bilingual education for their children, migrants having moved to another country or region facing the task of learning another language, educationalists, and politicians. The framework proposed here may help deconstruct the notion of native speaker in an orderly, empirical manner, distinguishing various linguistic and extralinguistic characterizations. Empirical research conducted along the framework's lines may produce outcomes crucial for answering the question, hopefully replacing folk beliefs by evidence-based considerations.

Furthermore, the question is relevant for scholars aiming at constructing theories explaining phenomena of L1 acquisition, bilingualism, and multilingualism. The question of whether a nonnative speaker can attain native speaker

linguistic cognition in a L2 is not an anomaly. Arguably, a nonnative speaker cannot become a native speaker (because only native speakers begin to acquire the language in early childhood at home), but it is an entirely empirical matter whether nonnative speakers (to be subdivided into several types using the extralinguistic characteristics presented above) can attain L2 cognition indistinguishable from the linguistic cognition of native speakers (to be subdivided into several types using the same extralinguistic characteristics). (Note that on the first dimension, the category of monolinguals does not concern nonnative speakers by definition.) There is strong empirical support for the claim that even very advanced L2ers continue to be affected by crosslinguistic influence in both directions (Jarvis & Pavlenko, 2007), meaning that it is almost ruled out that bilinguals can become indistinguishable from monolinguals, at least in the domain of monolinguals' BLC (Hulstijn, 2015, pp. 47–50). However, by deconstructing the notion of native speaker along the extralinguistic dimensions presented here through comparisons of different types of nonnative speakers with different types of native speakers (not just monolinguals), there is probably more to discover than persistent crosslinguistic influence. For example, in how many typologically related and unrelated languages can a person attain BLC in the lexical–grammatical domains of these languages, and how should we explain observed possibilities and restrictions? What roles do extralinguistic attributes (such as age, level of education, general cognitive abilities) play in this issue? This may provide us with a differentiated picture of complete language control and factors associated with individual differences. Grosjean's (1989) famous claim (and—at the time—very healthy warning to neurolinguists) that a bilingual is not two monolinguals in one person should not hold us back from taking Q1 seriously and investigating it along the lines of the framework presented in this article. Once we have empirical evidence at our disposal, obtained by using the framework, we are likely to know better than we currently do what the phenomena are that a theory of L2 acquisition and bilingualism has to explain. Hulstijn (2015, p. 53) speculated that "the likelihood of a person acquiring BLC in two (or more) languages is determined (i) by age of onset, and (ii) amount of exposure and productive language use."

## Using the Framework for Studying the Age Question in L2 Acquisition

The issue of whether children (early starters) are ultimately more successful L2 learners than adults (late starters) is still unresolved despite an impressive body of empirical research. It has produced a host of theoretical explanations and empirical studies, summarized by, for example, Abrahamsson and Hyltenstam

(2009), Birdsong (2006), DeKeyser (2012), De Groot (2011), Hyltenstam and Abrahamsson (2003), Long (2013), and Muñoz and Singleton (2011). The empirical study of this matter typically involves the comparison of early and late starters with one another on performance on some measure(s) of L2 proficiency, elicited after many years of L2 use. An even stronger way of studying this matter is to compare both early and late starters (at very advanced levels of L2 proficiency) with a reference group of L1ers. This can be done, for example, by asking L1ers to judge samples of speech elicited from highly advanced L2ers and L1ers on a scale of nativelikeness. In some studies, speech samples of L2ers and L1ers are additionally analyzed in a more objective way. For example, in a landmark study conducted by Abrahamsson and Hyltenstam (2009), the researchers "scrutinized" the "near-nativelikeness" (p. 273) in L2 Swedish of highly proficient Spanish–Swedish bilinguals living in Sweden; they did so on 10 objective measures, such as production and perception of voice onset time in voiceless consonants and speech perception in noise. The aim was to ascertain to what extent the bilinguals "performed within the native-speaker range" (p. 249). Thus, the comparison with native speakers formed a crucial part of this study, essential in addressing the age question. Note, however, that even in this study, which may be considered as the—to date—methodologically most thorough study, all 15 individuals in the native speaker comparison group had minimally obtained a senior high school diploma (Abrahamsson & Hyltenstam, 2009, p. 275). It should be acknowledged that the researchers had their reasons for applying this selection criterion because the nonnative speakers in this part of their study also had attained a similar educational level (a matched comparison group).[5]

Andringa (2014, pp. 571–574) looked at 35 empirical studies of the age question and observed that in only one study (Coppieters, 1987), explicit attention was paid to the selection of participants for the native speaker comparison group, taking regional background and level of education into account. One wonders what would have been the outcomes of the 34 other studies if the native speaker comparison groups had consisted of a (large) sample truly representative of the population of native speakers in terms of (at least) degree of bilingualism and amount and kind of literacy experiences.

**An Illustrative Study**

A recent study, particularly relevant and illustrative in the present context of native/nonnative comparisons and the L2 age question, was conducted by Andringa (2014). In this study, 124 adult native speakers of Dutch (differing in level of education) and 118 adult nonnative speakers of the same language

completed five oral comprehension tasks and a written receptive vocabulary test. Following a procedure characteristic in research on the age question in L2 acquisition, Andringa ascertained the incidence of nonnative speakers falling within the native speaker range of scores (from minus two to plus two standard deviations from the mean), for each task separately (for details of the statistical procedures, see Andringa, 2014). Two subgroups of native speakers were then formed, one group representative of the country's population at large in terms of level of education (RS), and one group consisting of university students (the nonrepresentative sample; NRS). The researcher then determined, for each task, how many nonnative speaker scores fell inside or outside the ranges of the RS and NRS native speaker groups. For vocabulary:

> 63 L2 learners were excluded by both norms, and 29 learners were included by both. However, 22 learners (19%) fell outside the NRS norm but inside the RS norm. This suggests that it is easier to meet the norm set by the RS than the norm set by the NRS. Although the numbers differed from task to task, this pattern of results was obtained for all of the tasks . . . . [T]he observed distributions may be considered significantly different from one another. (Andringa, 2014, p. 585)

Thus, this study illustrated how one can investigate differences in adult L1ers on linguistic tasks (in this case five comprehension tasks) as a function of an extralinguistic attribute (in this case level of education) and then make comparisons with performance of L2ers on the same tasks (see also DeKeyser, 2013). The framework proposed here, along with BLC Theory, can be used to investigate to what extent the following claims can be empirically supported:

> BLC, while being attainable by late L2 learners in the domains of vocabulary and many or even most grammatical structures, will generally not be attainable in the domains of pronunciation or with respect to the production of some grammatical features in spontaneous, unmonitored speech . . . Late L2 learners can become as proficient in HLC [higher/extended language cognition JH] as L1ers of the same intellectual, educational, professional and cultural profile, despite some deficiencies in their L2 BLC. (Hulstijn, 2015, p. 53)

## Underlying Theoretical Matters: Generative Versus Usage-Based Explanations of Language Acquisition

Questions Q1 and Q2 that stood in focus in the previous sections of this article are primarily raised by stakeholders who want to know what the facts are.

Obviously, there is always a need for empirical research aiming to find an answer to these questions. But underneath them, there are more fundamental issues concerned with how the generative and the usage-based schools in linguistics explain language acquisition, in particular with respect to the theoretical explanation of shared linguistic cognition (BLC). Hulstijn (2015) argued that it is important to know what the properties are of that part of the magnasyntax of a given language that is acquired by all L1ers (not affected by language-related disorders), regardless of differences in intellectual abilities or attained levels of literacy and education. To account for the successful acquisition of this shared subset of magnasyntax, what is it in the mind/brain that newborns need to be equipped with? This is not a trivial matter because it may play a role in the debate between scholars in the generative and usage-based schools, with respect to the biological and cognitive makeup of the human species at the current stage of its evolution (Evans & Levinson, 2009). Must the acquisition of BLC be guided—as scholars in the generative school argue—by a Universal Grammar or by a similar device restricting the learner's hypothesis space to successfully overcome the "poverty of the stimulus" (the insufficient evidence in the language to which the child is exposed) (Chomsky, 1980)? Alternatively, can the acquisition of BLC be sufficiently explained by general cognitive devices, also at play in the development of cognitive functions other than language, as scholars in the usage-based school argue, such as functional distributional analysis and making analogies across constructions (Tomasello, 2003, pp. 163–173)? (For a critical but fair evaluation of generativist and usage-based accounts of L1 acquisition, see Ambridge and Lieven, 2011.) One motivation to construct BLC Theory with its key construct of BLC was to propose that the dispute between the generative and usage-based schools should be focused primarily on the phenomena of linguistic cognition shared by all L1ers.

**The Empirical Domain of a Theory of L1 and L2 Acquisition**

Generative linguists assign themselves the task of characterizing, in the most parsimonious way, the grammar that generates (accounts for) all sentences that the "*ideal speaker–listener*" (Chomsky, 1965, p. 3) of a given language could understand and say, unconstrained by processing limitations. To attain this goal, generative linguists need to decide which sentences and which underlying grammatical structures belong to the language. For this purpose, they avail themselves primarily of their own intuitions; data of language use (corpora of spoken and written production) are used to a limited extent because often corpus data do not suffice to decide whether something could be said. In Chomsky's words, "observed use of language . . . may provide evidence as to the nature

of this mental reality [competence JH], but surely cannot constitute the actual subject matter of linguistics" (1965, p. 4; see also p. 24).

To appreciate the use of grammaticality intuitions, it is important to distinguish between (a) the goal of describing the grammar that generates all (and only) grammatical sentences of a language from (b) the goal of explaining phenomena of (first and second) language acquisition. It is fairly unproblematic if linguists (highly literate individuals) primarily use their own grammaticality intuitions for the first purpose. The empirical domain of a theory of this kind thus primarily consists of metalinguistic data (intuitions about grammaticality).[6]

A language acquisition theory, in contrast, has a different empirical domain and a different purpose. The empirical domain concerns people's competence constrained by processing limitations, that is, the utterances that real L1ers (or L2ers, in the case of L2 acquisition) can comprehend and produce:

1. Lexical-grammatical structures that can be comprehended by all adult L1ers.
2. Lexical-grammatical structures that can be produced by all adult L1ers.
3. Lexical-grammatical structures that cannot be comprehended by all adult L1ers.
4. Lexical-grammatical structures that cannot be produced by all adult L1ers.

An adequate theory of language acquisition serves, at least, the following two aims: (a) to explain for each structure why it falls in the first, second, third, or fourth category and (b) to describe how the structures in these four categories are acquired over time (development). Scholars in the usage-based school (e.g., Ellis, Römer, & Brook O'Donnell, 2016; Elman, 1999; Lieven & Tomasello, 2008; Tomasello, 2003) are better equipped to fulfill this task than scholars working in the generative tradition because processing limitations form an inherent part of the competence of real L1ers under the usage-based approach, while processing limitations do not constrain the competences of the nonexisting idealized native speaker under the generative approach. For example, extemporaneous speech of real people exhibits no more than one center embedding, simply because of working memory limitations (Hulstijn, 2017). Therefore, infinite recursion, in the sense of unlimited center-embedding of a clause into a higher clause, is not a phenomenon that needs to be explained in a theory of language *acquisition* (Christiansen & Chater, 2015).

In usage-based linguistics, including Emergentism (MacWhinney & O'Grady, 2015), an abstract grammatical construction in a person's mental grammar (representation) cannot be fundamentally separated from (constraints on) its processing in comprehension and production tasks. An individual's mental grammar represents, as Bybee (2013, p. 2) succinctly put it, "the

cognitive organization of one's experience with language." As Langacker, one of the founding fathers of usage-based linguistics, stated: "With repeated use, a novel structure becomes progressively entrenched, to the point of becoming a unit: moreover, units are variably entrenched depending on the frequency of their occurrence" (1987, p. 59). In a chapter about probabilistic linguistics, Bod (2015, p. 663) stated that linguistic phenomena "display properties of continua and show markedly gradient behavior," referring to, among others, Bybee and Hopper (2001), Ellis (2002), Jurafsky (2003), and Jaeger and Snider (2008). Probabilistic linguistics is not just about modeling gradient linguistic phenomena, but it also makes the cognitive claim that "probabilities are an inherent part of the human language system" (Bod, 2015, p. 664). "[L]inguistic competence would consist not of a collection of succinctly represented generalizations that characterize a language, rather, competence may be nothing more than probabilistically organized memories of prior linguistics experiences" (Bod, 2015, p. 691; see also Pajak, Fine, Kleinschmidt, & Jaeger, 2016). Thus, while in generative linguistics, Chomsky's ideal native speaker "is unaffected by such grammatically irrelevant conditions as memory limitations" (1965, p. 3), for usage-based and emergentist linguists, limitations in humans' information-processing capacity form an inherent part of their mental grammar. Furthermore, for a theory of language acquisition and use, there is no a priori need to postulate rules (that operate on members of abstract categories) in the mental grammar of native speakers. In other words, the term "mental grammar" here does not refer to a tacit, underlying "system of principles and rules" (Haegeman, 1991, p. 9), as in the generative tradition.

For example, Hawkins's (2004, 2014) grammatical efficiency theory, to be placed in the usage-based/emergentist school, aims at accounting for the design of grammars (of natural languages) on the basis of language performance (language production and comprehension). For Hawkins, phenomena of human sentence processing constitute the empirical domain of his efficiency theory, and this theory consists of various principles that govern sentence processing (see also MacDonald, 2015).

According to the linguists in the usage-based school, a person's mental grammar consists of a network of structures/constructions that differ in degree of entrenchment. Structures that have been frequently and recently experienced in the input are entrenched firmly in the person's mental grammar, in the grammar's nucleus as it were; they can easily and quickly be accessed and used in language comprehension and production. Furthermore, such well-entrenched structures are likely to be used frequently in extemporaneous oral language production. Other structures, however, to which the person has been exposed

only infrequently, are embedded and incorporated weakly; they are located on the grammar's fringes as it were. These structures are expected to occur only infrequently in extemporaneous oral language production. Under this usage-based, probabilistic view, the mental grammars of people with many years of exposure and productive use (adult L1ers, highly proficient L2ers) are characterized by probability, frequency, and recency rather than by a dichotomous presence/absence of grammatical/ungrammatical structures. To explain the differential entrenchment of linguistic patterns, it suffices to postulate that human beings are equipped with domain-general information-processing capabilities (MacWhinney, 2015, pp. 13–14). It is thus not necessary to postulate that human beings are born with a highly abstract device, Universal Grammar, restricting the class of possible grammars of human languages. As Tomasello (2003, p. 7) put it: "There is no poverty of the stimulus when a structured inventory of constructions is the adult endpoint." In this context, it is worth quoting Perruchet and Poulin-Carronnat, rounding off their paper on the learnability of language in the following way:

> Providing growing evidence that domain-general learning processes are in fact appropriate for language acquisition such as observed in children, and not affected by the limitations that have been traditionally construed as lethal (such as lack of negative evidence, and the combinatorial explosion that would result from blind associative learning processes), deprives a nativist account from most of its original motivations. In this context, still claiming that what has to be explained is an idealized competence, and that any performance improvement is driven by the full knowledge of a grammar, can certainly not be proven wrong, but appears increasingly as reflecting nothing more than a dogmatic entrenchment. (2015, pp. 160–161)

Yet, although the usage-based school stands a better chance of explaining language acquisition than the generative school, it should be acknowledged that, as Ambridge and Lieven (2011) have made clear, a lot of work still has to be done until a detailed and full account of L1 acquisition can be given.

## Summary and Conclusions

The framework presented in this article can be used to examine differences and commonalities in native speakers' (L1ers') language cognition as a function of their extralinguistic characteristics. This will help us find answers to the questions pertaining to complete or native control of two languages (Q1) and to ultimate attainment in early and late L2 learners (Q2), with which this article

began. More importantly, by using the distinction between shared/nonshared lexicon and grammar, we are forced to address the underlying, more fundamental issues in L1 and L2 acquisition concerned with (a) explaining why some structures are comprehended and produced by all L1ers while many others are not and (b) describing the acquisition over time (development) of lexical-grammatical structures comprehended or produced by all L1ers and those not comprehended or produced by all. The working hypothesis proposed here is that literacy experiences and L1 instruction in elementary and secondary school play a very important role.

A central point in this article is concerned with the empirical domain of theories of L1 and L2 acquisition, and hence with the kind of data we elicit, collect, analyze, and interpret in empirical research. The empirical domain of a language acquisition theory (L1 as well as L2) lies primarily in language comprehension and language production data (what people of different ages and different literacy experiences can comprehend and say; that is, competence constrained by processing limitations), not primarily in the linguistic intuitions of linguists (Chomsky's idealized competence, unconstrained by processing limitations). This view undoubtedly will be contested by researchers in the generative school. (For a recent overview of the debate between generative/formal and usage-based/functional approaches to SLA, see Shirai and Juffs, 2017, and the other contributions of a special issue of *Second Language Research* on this topic.) Arguably, regardless of whether we are empiricists or rationalists, we assume that something must exist (ontology) in the mind/brain that allows people to speak. Under a usage-based account, this something consists of abstract constructions that have gradually become entrenched more or less deeply. We cannot directly observe this abstract representation; it has to be inferred from language comprehension data (overt or covert) and language production data, in natural as well as laboratory settings.

A second central point in this article is concerned with individual differences in populations of L1ers (native speakers). In much of the empirical literature in SLA and bilingualism comparing L2ers (nonnative speakers) with L1ers (native speakers), in particular in research comparing early and late L2 learners, participants in the L1 comparison groups are not representative of the L1 population at large. Thus, there is a serious problem with the validity (representativity) of the data obtained in this research. In line with Birdsong and Gertken's (2013, p. 108) proposition that native/nonnative comparisons are "not invariably a fool's game," I have tried to show that comparing L2ers with different types of L1ers, as proposed in the framework, will deepen our understanding of L2 acquisition and bilingualism. In terms of research method,

it is recommended that in future research in the fields of SLA and bilingualism, attention should be paid to the selection of participants on the extralinguistic attributes contained in the framework (see Figures 2 and 3).

In line with Kidd et al. (2018), the framework presented in this article may function as a useful research agenda for studying individual differences in L1ers and L2ers and for comparing L2ers with L1ers to help answer the question concerning complete/native bilingualism (Q1) and the age question in L2 acquisition (Q2). The framework rests on the distinction between shared language cognition (BLC) and nonshared/extended language cognition, proposed in BLC Theory. As Hulstijn put it:

> In academia, we propose explanatory theories (with constructs and construct distinctions) not because we believe that theories correctly account for all phenomena that need to be explained but because this is a good way to decrease our ignorance and increase our insight into the puzzling phenomena that we want to understand and explain. In other words, the BLC–HLC dichotomy is likely to be wrong, but at this moment we don't know exactly to what extent and where it is wrong. (2015, p. 55)

BLC Theory, as most theories in the behavioral sciences, is probably wrong, or at least not entirely correct. A theory is primarily a heuristic tool. I hope that other researchers will find the theory sufficiently challenging to engage in research aiming at falsifying it or proposing modifications of it.

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## Notes

1 In Hulstijn (2011), the two constructs were named basic language cognition (BLC) and higher language cognition (HLC). In Hulstijn (2015, p. 21), the label extended language cognition is preferred over HLC; BLC is also referred to as "the language cognition that all native speakers have in common" (p. 21) or "shared ability" (p. 26). In the present article, the labels "shared" and "basic" language cognition are used alternatively.

2 In the present article, only the notion of BLC (language cognition shared by all native speakers) and the matter of individual differences stand in focus. The remainder of the theory, pertaining to the dimension of core versus peripheral components of language proficiency, is therefore not presented here. In Hulstijn (2015, Chapter 3), it is shown how BLC is somewhat similar but essentially different from the constructs of restricted code (Bernstein, 1962, 1972), basic interpersonal communicative skills (Cummins, 1980a, 1980b), and language

produced in tasks categorized as low with respect to both the dimension of Analysis and the dimension of Control (Bialystok, 1978, 1982, 1986, 1991, 2001).

3 The choice to restrict the definition of BLC to comprehension and production of oral language is motivated by the consideration that the disagreement between the generative and usage-based accounts of L1 acquisition concerns L1 acquisition of infants and children in their preliterate years, exposed exclusively to oral input and not having received language instruction in school yet. One reviewer of this article remarked, however, that this restriction squares with the fact that "in modern industrialized societies all unimpaired speakers achieve at least a basic literacy, so if BLC is defined as the aspects of language shared by all native speakers, this is difficult to defend." My response to this remark is that BLC Theory (including the construct of BLC) is proposed to help unravel fundamental issues in the study of L1 and L2 acquisition. If some researchers would like to include basic reading and writing skills in the definition of BLC, I don't object. One could then establish whether research on the basis of the extended definition would produce observations that otherwise would have gone unnoticed.

4 Hulstijn (2015, p. 41) also distinguished a notion of core, but that is different from the notion of BLC.

5 Cook (2016) and Wei (2016) complained that many empirical SLA studies may be invalid because they compare nonnative with monolingual native speakers. The notion of monolingual native speakers is a "myth" (Wei, 2016). It seems, however, that, more often than not, the native speakers in SLA studies are highly literate university students, who have been trained in the conventions of what Davies (2013) calls the Standard Language and may perform as participants in SLA research more on the basis of the conventions of the Standard Language than on their monolingual vernacular, if university students are indeed monolingual.

6 As has been noticed by Coulmas (1981, p. 10), Davies (2003, p. 5), and others, Chomsky uses the term "grammar" with an intentional systematic ambiguity, referring to "first the native speaker's internally represented 'theory of his language' and, second, to the linguist's account of this" (1965, p. 25). This quotation suggests that all native speakers acquire the grammatical features presented in the generative literature.

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