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**Imbalances in bilingual development:  
A key to understanding the faculty of language**

Norbert Francis  
Northern Arizona University  
[norbert.francis@nau.edu](mailto:norbert.francis@nau.edu)

Abstract

Investigators of first language attrition, early bilingualism and child second language learning have found common ground on a number of important points. The present review of the research will show that the study of unevenness in the early development of two languages reveals more clearly how the critical problems for future research on bilingualism should be framed. The convergence of the above mentioned fields of study will contribute greatly to this important reflection and re-assessment. In addition, clarity on the question of balanced and non-balanced bilingual development is important for understanding how the Faculty of Language guides acquisition in all circumstances.

**Introduction**

Cross-linguistic interaction and the different kinds of asymmetry in bilingual development have come to the forefront in the research on child language in recent years. Closely related areas of work, the study of how the language knowledge systems interact and the study of the differential effects of this interaction on language-A ( $L_a$ ) and language-B ( $L_b$ ) touch on virtually all important research questions in the field of bilingualism and second language learning. In a recent special issue of *Applied Psycholinguistics*, two articles directly address central issues related to this area of work (de Houwer, 2007; Meisel, 2007). A third (Mayberry, 2007), while appearing to address it indirectly, presents a line of research and conceptual framework that points toward resolving the most important problems posed by the first two.

In an extensive survey of parental language input patterns in bilingual families, de Houwer calls attention to a persistent imbalance in child bilingual ability - an apparent puzzle, one that we could tentatively describe as a Paradox of Bilingual Acquisition. While child monolingual development achieves a success rate of 100% (related to the notion of 'completeness'), exceptional cases of impairment aside, only a (perhaps major) fraction of children raised in families in which there is active bilingual socialization attain complete native-speaker mastery in both languages. Results of the study indicated an estimated success rate of 75% for two languages. Most interesting was the finding that widely commented approaches to promoting child bilingualism (e.g., the one-parent-one-language rule) were neither necessary nor sufficient for native-speaker ultimate attainment in two languages. Even the most ambitious approaches of favoring the minority language, for example, fell short of expectations: in 3 to 6.5% of families in the sample in which there was evidence of exclusive or predominant use of the 'home language,' children did not speak it (de Houwer, 2007, p. 421). In other words, it seems that completeness may be attained in  $L_a$  and  $L_b$ , or in only one or the other.

Meisel's discussion of conceptual problems in the research on uneven child bilingual development is among the most important recent contributions to our understanding of this many-faceted question. Relevant it is as well to some of the critical debates in the broader field of first and second language acquisition. Four closely related points in particular deserve our careful consideration, each of which will be taken up in turn:

- Given exposure to  $L_a$  and  $L_b$ , are manifestations of the developmentally delayed or Weaker Language the result of imbalances in competence or performance?
- What explains early differentiation between the language systems of the bilingual? At first glance, it appears that this cross-language differentiation is tied to the concept of an endowment for bilingualism/multilingualism (Genesee, 2003; Pettito et al., 2001).
- The first two points lead to an assessment of the Weaker Language Hypothesis (Schlyter, 1993). Under what circumstances might the weaker or non-dominant language of simultaneous bilingual acquisition come to resemble a second language - or - is this even possible? Part of the discussion here concerns the different proposals among researchers on the more fundamental issue of how first language and second language competence differ.
- What are the research prospects on gaining a better understanding of the possible external factors (and 'internal,' we might add) that are causally related to either processing imbalances ('performance factors') or to the development of partial competence (representational, or knowledge-of-language factors)? Specifically, which domains of language ability or grammar knowledge are likely to be affected?

In the discussion of these four points, for argument's sake, the same basic assumptions made by Meisel about the nature of the Faculty of Language (FL) and the theoretical framework of Universal Grammar (UG) will be accepted. At the same time, these research problems of imbalance and differentiation may lead us to question some of the proposals of mainstream Universal Grammar in the field of bilingualism. But much discussion still lies ahead before the lines of debate can be clearly drawn.

### **1. Use of language or knowledge of language**

One way to approach the problem of the distinction between performance and competence is to think of the different kinds of language ability as comprised, in each case, of a complex of knowledge structures and processing interconnections.<sup>1</sup> In uneven bilingual development the emergence of a weaker/non-dominant language can be attributed to two different kinds of imbalance involving: (1) component mechanisms of language and information processing, unrelated to or apart from competence, or (2) competence itself, keeping in mind that processing and competence factors together may affect ability. Under #1, the non-dominant language might be subject to a temporary lag in the rate of development. How the language systems influence each other in actual comprehension and expression may result in an inhibition of processing interfaces and other types of operation that act upon the competence modules. In some way, a limitation is imposed on how all these components are put to use in the

performance of abilities (consideration of the other logical possibility, that of a ‘permanent inhibition,’ will be deferred to Section 4). In contrast to this temporary processing-induced delay, diminished competence in the non-dominant language (imbalance #2) assumes a delay in the growth of actual language knowledge. In regard to a competence imbalance, the two logical possibilities, in this case, should also be accepted as plausible outcomes: an attenuated initial advance in the construction of grammatical knowledge or one that results in a definitive non-native ultimate attainment in either  $L_a$  or  $L_b$ .

According to Meisel's distinction between these two kinds of imbalance, in explaining processing factors of asymmetry (imbalance #1), system inhibition figures as the most prominent causal factor. On the other hand, imbalanced competence would be characterized by or described as acquisition failure or incomplete acquisition of the non-dominant language. The former is a quantitative tendency in development, of usage and proficiency; the latter is qualitative, about the properties of linguistic knowledge. In attempting to distinguish between the two, one could examine performance errors in bilingual child speech that might reflect incomplete acquisition. For example, the appearance of null subjects or objects, null articles, and so forth, not permitted in the target language, at higher frequencies than expected, might be evidenced in some contexts but not in others. This would indicate that the deficit at issue might not be one of grammatical knowledge, but rather a problem of consistent usage. In addition, it would be necessary to demonstrate somehow that omission patterns in the Weaker Language (WL) are qualitatively different from those of monolingual children; and even if such evidence were to be presented, what importance would we attribute even to a significant delay in the emergence of a given grammatical pattern if at some later point in development it eventually does emerge?

Dussias (2004) discusses the kind of evidence that would be necessary to be able to distinguish, in adult bilinguals, between erosion that has “occurred at the source of knowledge” (p. 368) as opposed to interference and control of processing phenomena. Regarding the latter, in an interesting study of the role of inhibitory control of L1 structures, Levy et al. (2007) argue that such inhibition helps learners overcome interference during early L2 learning. These effects were demonstrated in short-term L2 learning tasks on subjects whose rudimentary mastery of the L2 categorically excluded any possibility of L1 competence erosion. At a ‘deeper’ level involving more than just processing imbalances, given that there are finite memory and processing resources available to the bilingual (conceivably more limited in young children), there ensues a competition for these resources. As a result, some components and subsystems may come to be favored at the expense of others (Köpke, 2004). The less frequently activated subsystems and structures are thus inhibited under the influence of the competitor language, for example an expanding L2 (Gürel, 2004). Initial (even seemingly minor) usage preferences raise the activation threshold for lexical entries, for example, in the ‘dispreferred’ system. For preschool age bilinguals, control mechanisms that regulate the use of the two grammatical subsystems might respond to even slight imbalances, more so than in the case of mature bilingual speakers. We will return to the question of the effects of interlinguistic competition in Section 4.

While it is arguable that the processing-competence distinction is necessary to maintain, making a clear demarcation in early child bilingualism may turn out to be

exceedingly difficult, if not impossible by any method. One approach to the conceptual problem, at least, might be to work ‘backwards’ longitudinally, taking as a starting point two contrasting distributions of bilingual ability, for example, in late childhood:

- (1) in a population of balanced bilinguals, that fraction whose early bilingual ability was marked by a relationship of dominant-nondominant  $L_a$  and  $L_b$ . That is, delay in the WL was temporary; and
- (2) older child bilinguals (and former bilinguals) whose imbalanced ability has stabilized or become more pronounced.

For #1, evidence could be marshaled that points to a processing explanation in some cases, without excluding definitively a competence differential in others. On the other hand, in #2, it would seem that the older the bilingual and the more stabilized the non-dominant or attrited system, the less likely it would be that the underlying cause can be traced to processing factors alone.

In some ways, it is the second scenario that is more interesting: an early/premature stabilization at an incomplete grammar in the WL, or outright L1 attrition. One question that is raised is whether the WL, in this case, has taken on a status, a mental representation, similar to that of a second language. In temporary delay, with the benefit of hindsight, the answer is obvious. What sense would there be even to try to distinguish between a three-year-old's immature L1 grammar and a hypothetical ‘L2’ grammar – temporary WL of early childhood bilingualism? However, in long term/permanent delay, the question cannot be dispensed with so easily; among normal children, only second language development undergoes stabilization short of the target language (often termed ‘fossilization’). A first approximation to this problem requires a consideration of the ‘UG in L2’ question: are second languages UG-constrained, and does L2 development depend, at least in part, on recourse to the Language Acquisition Device? Sorace (2003) and White (2003) offer one set of considerations for discussion. From this point of view, what exactly might ‘acquisition failure’ mean? In terminal L1 attrition, one could argue that there is a *language-specific* failure, confined strictly to the attrited language subsystem (‘language’ with a lower-case ‘l’), similarly for sharply insufficient input conditions for  $L_a$  or  $L_b$ . Deprivation in primary language development results in actual impairment of the acquisition mechanisms (and defective ‘Language’ with a capital ‘L’). But should the term ‘failure’ also apply to a WL that begins to develop and stabilizes in the manner of a L2?

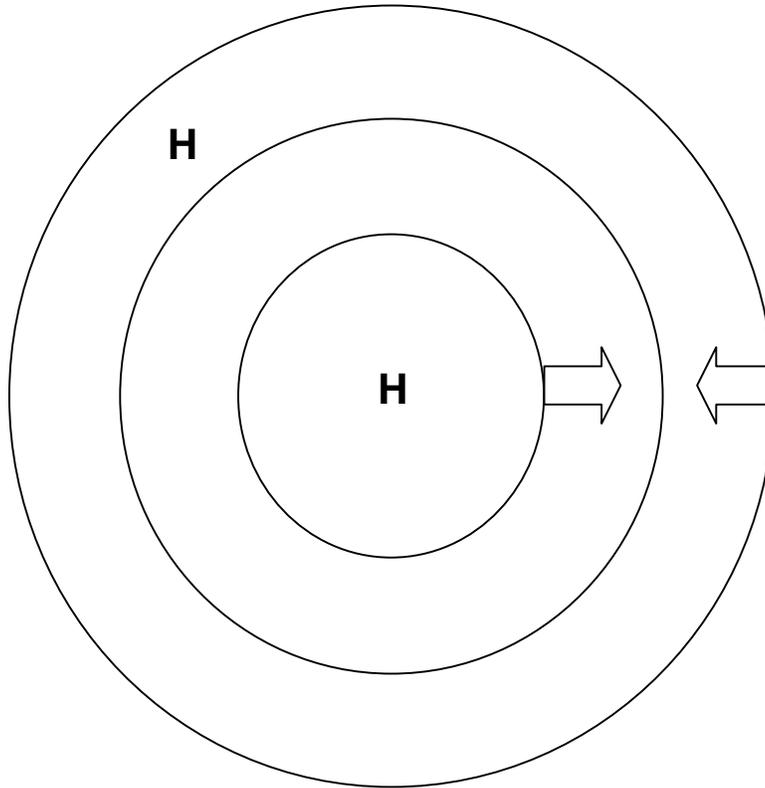
Meisel (2007) agrees that the LAD will not be able to be fully deployed if ‘acquisition conditions deteriorate’ below a minimum level of usable Primary Linguistic Data. The defect in the research on this question so far, as he points out, is coming up with a principled approach for determining what that threshold might be in the case of a WL, and if in fact it is a question of a threshold at all. Admittedly, among UG-oriented researchers the problem of minimum acquisition conditions hasn’t been given the attention it deserves. It comes up when we consider L2 learning, L1 attrition, and separately, in language input deprivation; and the problem is actually quite difficult and complex. The important point is that “amount of exposure is unlikely to suffice as an account of the phenomena” at issue here (p. 511). This is one of the key topics of the next section.

## **2. The Paradox of Bilingual Acquisition meets the Logical Problem of Bilingual Acquisition**

For now we will set aside the factors discussed in the previous section related to processing and attend to knowledge of language in each grammatical subsystem of bilingual development: how competence comes to be represented, in particular how it comes to be represented unequally, when comparing  $L_a$  and  $L_b$ . One starting point would be the proposed Logical Problem of Bilingual Acquisition outlined by Yip and Matthews (2007) in their study of developmental asynchrony and cross-linguistic influence between dominant and non-dominant languages. Compared to the challenge faced by children in acquiring one language (that competence is underdetermined by language experience), exposure to two grammatical systems should impose an even greater burden on the acquisition capacities. Faced with more varied and more subtle input ambiguity (now cross-linguistically), why isn't bilingual acquisition marked by significant delay and defective mastery across both languages? The child is faced with the task of categorizing linguistic data into two sets, more conflicting evidence, and with opportunities to test hypotheses divided. Rather, parallel and equivalent attainment of native-speaker developmental milestones, or the same in one language or the other, by young bilinguals suggests that the acquisition mechanisms of the Faculty of Language are grossly under-exploited in monolingualism. Yip and Matthews portray the learnability problem of two languages in terms of a Poverty of Dual Stimulus.

Part of the overall problem of the Poverty of Dual Stimulus ( $PoS_D$ ) is what we could call the Subset-Superset problem in language acquisition, common to both L1 and L2. Figure 1 presents an adaptation (Francis, 2007) of Pinker's (1990) version of the same basic idea. In both child language development and second language learning, a rudimentary grammar forms around a set of 'hypotheses' that have been confirmed (the inner circle 'H'). The language acquirer/learner (henceforth 'learner' for short) is faced with the task of expanding the incipient system outward toward the complete target language (the intermediate circle). Incorrect hypotheses, formed in the outer ring (overgeneralization, transfer/interference from the bilingual's other language, etc.) come to form part of the developing grammar, and the learner must find a way of retreating (the centripetal arrow) from the hypothesized grammar that is 'too large.' In this instance of the  $PoS$  problem, the child learner's task consists in discarding structures that have been 'over-generated' (in the outer-H ring) without the benefit of negative evidence, which is not available in processible form to young children.

**Figure 1**  
**The subset-superset problem in language acquisition**



Especially in child bilingual acquisition we can see how ‘dual poverty’ does not mean ‘too little.’ According to one view, a fully engaged and unfettered, domain-specific, LAD makes it possible for young children to be able to converge on the target, overcoming the severe limitations, especially for them, of domain-general learning, such as systematic reflection on erroneous hypotheses, corrective feedback, and other kinds of attention to language form. Acquisition, therefore, must be subject to prior constraints on the ‘hypothesis space’ that learners depend on for convergence toward the target (Anderson and Lightfoot, 2002; Crain et al., 2006; Meisel, 2004; Pinker, 2004). For second language learners, in theory, negative evidence, metalinguistic awareness, domain-general cognitive strategies and explicit learning help compensate for a LAD that is inhibited, blocked or filtered to one degree or another. Parenthetically, the approach to the PoS problem taken in this discussion is somewhat different from that of many mainstream generative models. The Poverty of Stimulus should not imply that domain-general learning plays a marginal role in L1 acquisition.

In Replacing Language (RL) development (that coincides with L1 attrition), analogous processes unfold in which a fully-formed or immature, but well-formed and normally developing, native-speaker child grammar is subject to erosion or delay under the displacing force of an expanding linguistic subsystem: (1) The attriting L1 retreats now to a more rudimentary grammar (or undergoes a premature stabilization/delay).

The learner, of course, requires no negative evidence for the formation of new structures in the weaker or disfavored language; (2) New (interlanguage) grammar will come from both the smaller hypothesis set (inner-H) and the outer-H ring, based on positive evidence alone. Negative evidence is neither typically forthcoming nor necessary if attrition is progressive (convergence on the target language no longer an issue); (3) The RL also advances on the back of positive evidence. Having appropriated a fully engaged and unfettered LAD (because RLs are epistemologically equivalent to L1s; see Francis, 2005, for why in principle they must be), negative evidence, metalinguistic awareness, and the application of explicit learning strategies, again, are superfluous for the construction of a complete and mature native-speaker core grammar. In other words, replacement/attrition is also subject to the Logical Problem of Bilingual Acquisition. In particular we shall see how the ‘attrition’ aspect of RL development suffers from a Poverty of Stimulus condition of its own, a kind of ‘PoS in reverse.’

## 2.1 How much positive evidence does the LAD require?

Even the strongest version of a parameter-setting/triggering model of language acquisition must assume a minimum amount of usable Primary Linguistic Data to the UG-constrained acquisition processing mechanisms of the Faculty of Language. All children overcome the problem of stimulus poverty, but input cannot be too inconsistent or overly restricted (Pinker, 2004). Interestingly, in the case of bilingual acquisition, evidence from studies of early L1 attrition strongly suggests that this threshold, all other factors remaining equal, will tend to be higher, on average, in the Disfavored Language (DL) of the  $L_a$ - $L_b$  pair. ‘Disfavored’ here refers to either the  $L_a$  or  $L_b$  in early bilingual development where an external (e.g., sociolinguistic) or internal (cognitive or more specifically linguistic domain) factor might potentially impel development toward a differentiation between one dominant or stronger language and one non-dominant/subordinate or weaker language.<sup>2</sup> Montrul (2006, p. 354) argues along similar lines: “input appears to play an even more decisive role in bilingual acquisition than in monolingual acquisition, particularly if bilingual children are to develop balanced proficiency or maintain the two languages to some degree.” Stronger/dominant and Weaker/non-dominant, imply actual measurable categories of ability or knowledge. In the following hypothetical continuum (Table 1), for our purposes, the critical interval or range is where the exposure to each language in bilingual acquisition should be sufficient for native-speaker ultimate attainment even in the Disfavored Language: threshold conditions 7–10.

The very idea of a requisite ‘threshold’ is still not clearly defined, in theory accepted by all researchers, but difficult to specify and even more difficult to test empirically. The most compelling findings are of examples of input deprivation of one kind or another and the degree of success that child learners have had in overcoming it (Goldin-Meadow, 2005; Senghas et al., 2008). Nevertheless, the intriguing question here is how the notion of input threshold needs to be considered separately in monolingual development and bilingual development, as was pointed out by de Houwer. The hypothetical examples in Table 1 attempt to portray what should be considered as two different issues, two different kinds of ‘threshold’ in which different



English-Hebrew, Schmitt (2000), English-Russian. Allen et al. (2006), Pfaff (1999), and Silva-Corvalán (2003) while not explicitly focused on unambiguous instances of equivalent input distribution between  $L_a$  and  $L_b$  resulting in imbalanced ability, present cases in which there is a strong supposition that at least some of the study participants fell into the above three categories of attrition or delay, condition 8, 9 or 10. Working under the assumption that attrition of a  $L_a$  can only proceed concurrently with its replacement by a  $L_b$ , (or vice versa), studies have shown that stabilization and decline in the Weaker Language system undergo a more rapid onset and a deeper erosion the younger the child. In other words, even a slightly weaker immature grammar, for example, is more susceptible to the effects of ‘competition’ from a slightly stronger and more actively developing grammar (Köpke and Schmid, 2004) than would be the case in an older bilingual with mature fully formed grammars in  $L_a$  and  $L_b$ .

We can now return to the idea of how the Logical Problem of Bilingual Acquisition applies to L1 attrition. Assuming an epistemological equivalence between L1 and RL development, the logical problem must be the same for both (by extension, as will be discussed in Section 3, we can propose that the same logic, with a difference, applies to L2 learning). What is usually overlooked, however, is that the underdetermination of the course of development by input received is a logical problem not only for the Replacing Language but also for the receding (attriting) language. For example, investigators of imbalanced child bilingualism often attribute the early stabilization (and in some cases ‘decline’) of the non-dominant language to an imbalance in the external conditions of language acquisition: one language tends to be slightly, or more substantively, disfavored in actual day-to-day use, subject to sociolinguistic inequalities of prestige value, communicative utility, outright discrimination and public disfavor, reflected, in turn, in negative perceptions on the part of the child bilingual, and so forth.

Here now, the problem (the PoS paradox in reverse) consists in the widely accepted principle that none of these external conditions (short of Threshold #3 in Table 1) results in the deterioration of core grammatical competence in monolingual development. For example, regardless of how ashamed a child is made to feel about his or her native language, the development of grammar knowledge stays its course, to native-speaker completeness. The same impermeability<sup>4</sup> would conceivably apply to the strongly dominant language of child bilingualism if the non-dominant language is significantly less developed. External input conditions corresponding to the Disfavored Language appear to facilitate the actual fossilization and decline of grammatical competence *only in* bilingualism and *only if* a dominant language system begins to follow the developmental course of a RL. An apt metaphor for this reciprocal relationship is that L1 attrition is the “flip side of the L2 acquisition coin” (Montrul, 2005, p. 201). This seems to be the conclusion that one might be able to draw from the above cited studies of L1 attrition: if the DL had been, hypothetically, the only language of early socialization it would have clearly fallen into a category at Threshold #4 or above, input sufficient to ensure native-speaker completeness. Again, the difficult but important question of input conditions comes to the fore, one that linguists should no longer set aside. What is interesting is that in child bilingualism additional factors need to be taken into account to get the big picture.

Meisel (2007) emphasizes the importance of the findings of early separation of the bilingual's language subsystems. Indeed, the absence of a prolonged, or even transitory, 'fusion' of grammars, and the evidence for how early some of the subsystems begin to differentiate (Bosch and Sebastián-Gallés, 2001; Pettito et al., 2001) should be surprising to us, representing a compelling case for the PoS<sub>D</sub> problem, more so even than in monolingual acquisition. A number of aspects of bilingual ability such as equal conversational skill in both languages, pragmatically appropriate alternation, inhibition in performance of the non-selected language, and systematic codeswitching would be impossible to account for within a holistic and integrativist framework that rejects the separate subsystems model; also see relevant studies by Paradis, Crago and Genesee (2005) and Pettito and Holowka (2002). But the early and spontaneous autonomy of L<sub>a</sub> and L<sub>b</sub> also goes hand in hand with the other kind of differentiation under consideration in this section. The general consensus from studies of early bilingual asymmetry (Yip and Matthews, 2007) appears to be that the effects of 'delay' in the non-dominant subsystem do not significantly penetrate the competence of the dominant language (superficial and transient transfer effects aside), the latter's course of development remaining sealing off and on track. That is, 'delay' in bilingual acquisition, impairment and pathology aside, corresponds not to Language (with a capital 'L') but rather only to one or the other instantiation of it.

A more specific account of what the 'endowment for multilingualism' entails can now be proposed for further research.

*i. The capacity for bilingual acquisition*

Provided with sufficient input (above Threshold #6 in Table 1) children are capable of acquiring more than one language (up to and including native-speaker competence) with no additional or special input conditions beyond those that monolingual children receive.

*ii. Native-speaker ultimate attainment is ensured*

Exposure to more than one language during the critical period does not compromise any aspect of Language development (with a capital 'L'). Native-speaker competence is ensured in one language subsystem (The Provision of No-semilingualism), and may be attained in more than one (two primary languages - 2L1), again with no additional or special input conditions (such as direct instruction). The emergence of a non-dominant/weaker/attracting language system from among the child's 'early L1s' does not affect the overall course of development of the remaining dominant language (Autonomy of Linguistic Systems). N.B.: this hypothesis differs from a widely held informal version of the 'endowment for multilingualism': that given adequate input conditions in two languages 2L1 development is ensured.

*iii. General cognitive development ensured*

No negative impact on any aspect of intellectual development or general information processing skill results from any variety of early bilingualism; see Bialystok (2007) for a review of the research on "cognitive effects."

*iv. Child second language learning is part of the biological endowment for multilingualism*

Children provided with normal and typical exposure to language during the critical period are capable of learning and attaining high levels of proficiency in a second language (up to and including native-speaker levels). The completeness of Replacing Language development in L1 attrition and untutored near-native L2 attainment indicate that no sub-component or aspect of the LAD is lost during initial L1 acquisition; all of UG remains intact and continues to be a resource (subject to filtering/blocking from an unattrited L1 system) for L2 learning.

Readers are encouraged to consider an alternative model of bilingual development to the one presented in this section. The Competition Model (MacWhinney, 2005) does not assume a specialized LAD or the design features of UG. But interestingly it accounts for the L1-L2 attainment difference in a way that is analogous and parallel. Also, the Competition Model's application of the concept of "interference" in explaining shifts in dominance from L1 to L2 is consistent in large part with the RL development hypothesis.

### **3. How can we describe different kinds of imbalanced bilingualism?**

At first glance, Meisel's critique of the Weaker Language Hypothesis (WLH), attributed to Schlyter (1993), appears to be centered on a relatively narrow issue: whether the grammar of the Weaker Language of early bilingualism might come to be represented and develop in the same way as a second language. Secondly, what evidence would support a claim that a WL is of the same kind as a L2 (and different *in kind* from a L1, specifically, the dominant pair of 2L1 bilingualism)? A moment's reflection, however, prompts us to realize that the critique opens the door to a broader set of related questions:

- In the first place how can we describe the difference between development in L1 and L2?
- How might the nature of this difference be related to the difference between the dominant and non-dominant languages of early bilingualism?
- What is the role of UG in L2 learning, and
- how should we evaluate Age of Acquisition (AoA) effects?

Together, these questions provide another example of how bilingualism, especially in its peculiar asymmetries, allows for a privileged perspective on long-standing issues in the language sciences, as we saw in the previous section regarding evidence that contributes to a better understanding of the PoS problem.

#### **3.1 A fundamental difference between L1 and L2**

On the one hand, broadly recognized divergences between L1 and L2, acknowledged by researchers from equally divergent theoretical perspectives, point to a rough outline of a consensus: uniformity and spontaneity in the first (Lightfoot, 1999; Wexler, 1999), wide

variation in the second, most notably in regard to ultimate attainment (DeKeyser, 2005; Domínguez, 2007; Han, 2004). On the other hand, the view that a qualitative decline in language acquisition capacity, a marked offset, occurs around puberty seems to have been largely discarded. As proposals for a ‘L2 sensitive period’ end point are pushed further and further back for different grammatical modules, it appears that for *second languages* no such maturational offset age can be identified (Hakuta et al., 2003, MacSwan and Pray, 2005), strongly suggesting what the fundamental dichotomy may actually turn out to be: for L2, no critical age, *per se*, but rather a qualitative difference between L1 and L2, including for children (i.e., L1 acquisition, which can only proceed normally in early childhood, versus child L2 learning). Crucially, the No-critical-period-for-L2 hypothesis should not be confused with the different issue of a critical period for first language development. Clark (2003) presents an opposing view, dispensing entirely with the notion of a biologically programmed critical period, even for L1.

Now, the problem that presents itself is how, among bilingual children, can we draw a distinction between a L1 (the unambiguous mother tongue that manifests all the defining features of primary language, including automatic and spontaneous emergence and uniform native-speaker ultimate attainment) and a L2. What makes the problem important in the case of L2, as Meisel suggests, is that perhaps there is *no age cut-off* that can serve as a reliable marker; that is, “onset of acquisition during sensitive phases...is a necessary but not sufficient condition for native language acquisition” (2007, p. 496). Even more suggestive is the possibility that the factor of “sufficient exposure” to the target language (even during the pre-school years) does not suffice to explain why one language subsystem of early simultaneous bilingualism emerges as L1 and the others might diverge from native-speaker completeness. Could this weaker/nondominant language evolve toward a representation characterized by a L2-type linguistic competence?

### 3.2 Could the difference between the dominant and non-dominant languages of early bilingualism be fundamental?

The critique of the studies of delay in the WL speaks to this question directly, the counter-arguments presented by Meisel regarding findings of interlinguistic discrepancies being certainly well founded. Among young children the evidence for ‘acquisition failure’ in  $L_a$  or  $L_b$  is rarely conclusive. An early differentiation in rate of grammatical development, even a significant delay in the WL is difficult to assess. Even notably deviant features, contrasting sharply with monolingual age norms, do not prove the case for the emergence of a non-primary language type knowledge representation. But on the other hand, the findings from studies of delayed  $L_a$  or  $L_b$  development are necessary to account for. In regard to this research problem, it would be incorrect or misleading, impairment/trauma aside, to refer to ‘delayed bilingual development.’ This is because of the two linguistic subsystems only one is subject to inhibition and delay.

While during the period of early bilingualism even evidence of extreme delay may be inconclusive, the emergence of a weaker, nondominant, and attrited/prematurely fossilized language subsystem cannot be excluded. To do so would be tantamount to denying the possibility of such a competence asymmetry, restricting explanations of

imbalance to processing factors alone. Recall also, that quantitative measures of (equivalent) ‘amounts of exposure’ are neither reliable nor are they ironclad guarantees of balanced 2L1 competence. Clearly, for the many studies of imbalanced early bilingualism cited so far, longitudinal data at points during middle and later childhood will be required to then evaluate the initial findings retrospectively. In any case, as was suggested earlier, the implication of ‘acquisition failure’ appears to be too categorical, except in the clear-cut instances of insufficient input conditions (in Table 1, at or below threshold #3 for monolinguals and threshold #6 for bilinguals) and terminal L1 attrition (one of the topics of the next section).

### 3.3 The role of UG in second language learning

To say that the WL of early bilingualism patterns like a L2, or that its development resembles L2 acquisition, is only interesting if what is meant is that a qualitative competence differential distinguishes it from the primary dominant subsystem, and more interesting if the detour it takes from the course of the dominant primary language is not temporary. To begin with and to be clear, the WLH does not make the claim that child L2s (or adult L2s either) are formed by a different kind of knowledge (see Bernardini and Schlyter, 2004); that the primary L1 is UG-constrained, subserved by modularized language-specific structures and second languages are not, or that L2s are subserved by defective knowledge structures. This would be especially difficult to sustain in the case of early child language development.

To the extent that ‘acquisition failure’ in a WL implies such a deterioration or unavailability, it is not the best way to describe imbalanced competence. Rather, the proposal being made here is that there is no reduction in the language acquisition capacity. No ‘failure’ of the LAD occurs when the growth of competence does not mark the typical milestones on schedule, even in the case of extreme delay, precursor to premature stabilization. Then according to this approach, claiming that the WL resembles L2 becomes less controversial. If we came to the conclusion that it is possible for a WL or non-dominant language to begin to develop like a L2, this would not imply a failure of the LAD for the WL, or that only the stronger language is UG-constrained.

This view differs from the hypothesis that UG comes to be deteriorated or eroded as a consequence of setting parameters to L1 values, and that the acquisition capacity of the LAD is diminished in L2 learning (Bley-Vroman, 1996; Clahsen and Muysken, 1996; Schachter, 1996). However, the difference in approaches to the UG-in-L2 problem may not be as deep-seated as appears at first, as more recent studies seem to have suggested, e.g., Clahsen and Felser (2006). The idea that is favored in this paper, that the UG acquisition mechanisms come to be ‘blocked’ or ‘filtered’ implies that they are still potentially available to the L2 learner (i.e., still intact, in their entirety): (1) variably accessible when a fully formed and stable L1 mediates L2 learning, or (2) completely and uniformly accessible in RL development, as they were in L1 development, because they were never subject to deterioration. Thus, if the nonavailability-of-UG-in-L2 position could contemplate the possibility of blocking/filtering/inhibition, instead of loss of language acquisition capacity, then the models would be more similar than different. For example, L1-mediated L2 learning often gives rise to rule systems that are deficient (varying widely from early fossilized

to near-native). Non-native L2 competence is not constrained in the same way that native grammars are constrained as evidenced in diminished L2 ability (Clahsen and Felser, 2006); i.e., competence is incomplete, not just different. But saying that non-native grammars are not constrained in the same way does not imply that L2 learning does not require the resources of the LAD, because the Poverty of Stimulus problem still applies (Montrul, 2006), near-native and advanced L2 competence providing the most compelling examples (Sorace, 2003; White, 2003). In addition, since RLs *are* constrained in the same way as native grammars (attaining L1-category completeness), over the course of their development they must have had full access to an integral and undiminished LAD. The UG-guided language-specific acquisition mechanisms are unlikely to ever have suffered deterioration, then to be subsequently regenerated for the purpose of replacing an attriting language system. See Francis (2005) for a more complete exposition of the L1-filter/RL-development research proposal.

Perhaps some of the lingering resistance to the idea that UG remains intact, and that it participates in L2 learning, stems from the wide variation in L2 mastery (very unlike that in all typical L1 acquisition). How could early fossilization, final states at the low end, at the opposite extreme from near-native, be the product of an undiminished LAD? Part of the answer to this question can be found in the findings from research on child second language acquisition. Does it proceed more like the L2 of older learners (tending to share the properties of *second languages*) or more like first language development (sharing the *mother tongue* acquisition circumstances of their younger counterparts)? This point leads us to the last topic of this section.

### 3.4 How should we understand Age of Acquisition effects?

Recall that while they are related, the issue of AoA effects in L2 must be clearly separated from AoA in L1. Investigations of child L2 acquisition show why this separation is necessary. The studies of Herschensohn et al. (2005) and Schwartz (2003) revealed some important differences between adult L2 and child L2 learning. However, overall, it is the resemblance that is most notable, surprising if middle childhood is considered to still be within a critical or sensitive period for L2 acquisition. For example, unlike in L1, child L2 acquisition is marked by a dissociation between syntax and inflectional morphology, related, as it might be, to other instances of uneven development in second languages, again, not observed in L1. If further research shows child L2 ultimate attainment to vary in a similar way that adult L2 mastery is distributed, the L1-L2 dichotomy would be confirmed across all ages. In passing, this would also serve to undermine the idea of a critical period for L2, potentially, even, for any age range. Montrul (2006) makes a related suggestion. Importantly for this research question, a distinction needs to be drawn between child L2 learners whose L1 has undergone attrition and child L2 learners who have maintained their mother tongue as primary L1. In the former scenario the L2 is in effect a RL, sharing all the essential properties of a first/primary language.

All of the above is central to the discussion on the role of UG in second language acquisition. If the L2 development of children, even young children, shares characteristics in common with all L2 learning, this suggests a fundamental commonality between L1 and L2: access to UG in both. The divergences from L1

developmental patterns and the variation in ultimate attainment that characterize second languages then can be accounted for by the influence of the first language subsystem, a proposal known as Full Transfer Full Access (FTFA). It is similar in its essential aspects to the proposal outlined in the previous section for further research on imbalanced early bilingualism and L1 attrition. The L1-filter/RL-development hypothesis introduces one nuance to FTFA: that FA (full access) should be thought of as complete availability of UG, because none of it erodes during or after L1 acquisition. But the formation of L2 grammatical structures ('setting of L2 parameters') is filtered or blocked by the L1 subsystem (restricting access). These restrictions, or conditions, correspond to the FT part of FTFA.

#### **4. Research prospects: uncovering the factors that contribute to imbalanced bilingual development**

Current approaches to the research on imbalanced bilingual development point toward future directions along three lines: (1) applying a componential approach to bilingualism (Francis, 2008) that seeks to understand how imbalance and attrition are selective and systematic, for example in relation to vulnerable components and subsystems; (2) untangling the factors of processing and competence (Köpke, 2004), especially in relation to the notion of inhibition; and (3) achieving precision on the question of AoA effects, following the proposals of Mayberry (2007) on the essential developmental function of first language acquisition and the related question of how  $L_a$  and  $L_b$  subsystems (theoretically balanced) might differentiate into L1 (or Stronger Language) and L2 (or Weaker Language).

##### 4.1 Vulnerable domains in the weaker or attriting language

Attrition is not haphazard forgetting (Seliger, 1996) and non-dominant language systems appear to develop predictably, just like L2 acquisition is considered to be systematic. None of these three language development outcomes are based on a 'wild grammar.' This idea underlies an important line of research that seeks to identify the linguistic components that tend to be affected when a diminished competence or ability (in a non-dominant, attriting or second language) diverges from the expected course of native-speaker development. Such a goal corresponds to the need to "formulate theoretically motivated and empirically testable claims about the grammatical domains affected and the external factors causing such effects" (Meisel, 2007, p. 512).

If vulnerable domains, and their more resistant counterparts, are revealed selectively, this result implies systematicity, and the possibility that universal principles are at play. One line of research that has attracted a good deal of attention identifies the interface between so-called 'narrow syntax' and semantic/discourse knowledge as the source of instability in response to cross-linguistic influence. In child bilinguals, the non-dominant system appears to be especially prone to dominant system-induced attrition/replacement if the divergence begins to widen before the former has been consolidated. In this case, the interface domains may be more prone to such interference from the dominant system (Bolonyai, 2007; Sorace, 2005). For example, in Italian and Spanish, learners must acquire (or preserve) the syntactic structures that license null

subjects, and at the same time learn the conditions of discourse and pragmatics that constrain the use of this grammatical option. The conditions are complex and subtle, contrary to some accounts, involving more than just [+/-topic shift]. Interface domains have in fact been shown to be more vulnerable, for one, perhaps, because they require the integration of competencies from different components, a factor related to ‘complexity’ (Sorace, 2005). While it would be too categorical to claim that ‘narrow syntax’ is uniformly and persistently spared, for example in attrition, the finding of a tendency for greater degrees of vulnerability at interfaces is important to investigate further. It would bring up again two important issues from related work: whether deficient performance can be explained completely by processing factors, and whether L1s, L2s, RLs, non-dominant L<sub>b</sub>s, and attriting language subsystems all share the same kind of mental representation (e.g., UG-constrained) or not. Above all, and of major theoretical implication, is the question of what are exactly the properties of interfaces that maintain interactivity among the competence modules.

In a recent study, Argyri and Sorace (2007) hint at how difficult this problem will turn out to be. Setting out to test among child Greek-English bilinguals the relative vulnerability of ‘narrow syntax’ and the syntax-pragmatics interface, the results should prompt us to back away from the strongest claims regarding how robust and impermeable the ‘hard constraints’ of ‘narrow syntax’ are in imbalanced child bilingualism, and conversely in regard to the hypothetically inherent instability of the interface structures. Findings were mixed with assessments showing that one syntax-pragmatics interface construction not to be open to cross-linguistic influence and one of the ‘purely syntactic’ constructions found to be vulnerable.

Stepping back from the fine details of the language-specific analysis in each bilingual situation, the authors seem to be in favor of a discussion on what is an interface in the first place; for example, between what types of linguistic component are different kinds of interface implemented, and what kinds of structure in each case do they place into correspondence? In addition, from the many examples in the bilingual research literature it is possible to consider two categories of interface: one in which the relevant correspondences are effected completely below awareness and are not accessible to monitoring, in contrast to the kind that is subject to varying degrees of introspection and reflection in everyday language use. (Election of null-subject in Spanish and Italian and metalinguistic knowledge on the part of a bilingual child of cross-language variation involving transitive-intransitive patterns in Spanish and English, for example, come to mind.) An interesting alternative approach to this important research problem might be that of Allen (2006) and Jackendoff (2007): in regard to the interaction within grammar between form and meaning, develop a model that cedes some of the language components to semantics and discourse/pragmatics that have been traditionally (depending on one's theory) considered to be within the realm of syntax, all of syntax then becoming much more ‘narrow.’

#### 4.2 Two kinds of cross-language inhibition

As we saw in Section 1, the idea of concurrent activation and inhibition has appealed to investigators as a way to explain asymmetries in bilinguals' expressive and receptive abilities. Assuming that in normal language use access cannot be completely denied to

either language subsystem, that neither can be hermetically pre-selected out and kept out, the exercise of some kind of inhibitory control explains grammatically well-formed performance in one language or the other, and even in codeswitching. Importantly, language mixing in young bilinguals is not necessarily evidence of attrition of a weaker language or failure of inhibitory control (Halmari, 2005); in fact, the claim is that it usually is not. A breakdown (partial or temporary) or attenuation of this kind of cross-linguistic interface that controls interference might explain dominant language-induced errors and significant delays in the attainment of expected developmental milestones. A dominant language might be able to more easily and more often surmount the hypothetically less developed and more permeable processing/control mechanisms of this kind in young children.

So far so good. But, if we take language ability to be formed by a composite of competence modules and processing components (e.g., interfaces), we should hesitate to maintain a hard and fast non-interactive separation between competence and processing. In other words, the effects of processing and use might impact on actual linguistic knowledge, especially in an immature still-developing grammar. This hypothesis assumes that neither language subsystem of the bilingual child is in place at the early stages of development (including the possibility that they are in place ‘under the surface’ simply waiting for the respective sets of detailed and highly specific parameters to be fixed). It also assumes that acquired (language-specific) knowledge structures are not permanent, sealed off and impermeable to erosion. For example, perhaps, a dominant system may even begin to inhibit the emergence of structures of the slightly less robustly developing system if the onset of divergence between the two occurs early enough. Of course, all of the above speculation awaits a proper formulation, then to be eventually discarded or confirmed empirically.

In any case, they are not new to the field. Sharwood-Smith and Van Buren (1991) used the general idea of parameter-setting and resetting to first reject the notion of a completely encapsulated language-specific grammatical competence that is resistant to erosion; this would presumably include the purportedly ‘hard constraints’ of ‘narrow syntax.’ Thus, L1 attrition may proceed both within the domains of processing *and* knowledge of language. Second, since the core grammar of the attriting L1 is not closed off, air-tight, initial stages of attrition/replacement restricted to the complementary forces of activation and inhibition between  $L_a$  and  $L_b$  may be a precursor to an actual erosion of competence in one or the other. Recall, the proposal in this paper is that only in brain damage or other kind of pathology would erosion of competence occur in both. Köpke (2004: 4) summarizes Sharwood-Smith's earlier work on this proposal that presents itself still today as a framework for a research program on important unresolved problems of imbalanced child bilingualism. A three-stage development is proposed:

- (1) Performance deviations in the WL can be attributed to imbalances (‘failure’ is too strong) in processing related to the activation and inhibition mechanisms. Growth of competence remains undeterred;
- (2) a transitional stage in which the dominant language exercises significant influence on the WL, but the bilingual is still able to switch back to well-formed and age-appropriate native-speaker forms;
- (3) restructuring of the grammar – the emergence of a new modified competence. Following this approach, inhibition begins to act upon the actual construction of new grammar in the WL/attriting language

system, going beyond the inhibition on access to an intact grammar of a typically developing (non-attributing) WL.

#### 4.3 The essentiality of L1

The research by Mayberry and associates on delayed L1 learning in deaf signers prompts us to narrow the application of the concept of the critical period, resulting in a very important clarification about how the Language Acquisition Device is deployed in different circumstances of development. Whereas AoA effects for L1 have been found to be robust and consistent, they are mixed and not consistent for L2, suggesting again that for L2 acquisition different questions need to be asked, in addition to some of the same ones. Mayberry's findings provide an important clue to the question of under what conditions, precisely, does an actual deterioration of the LAD occur: in the case of late deaf learners, clear evidence that in delayed L1 development (outside the window of opportunity bounded by the critical period) the LAD suffers a material degradation, affecting all subsequent language development in both L1 and L2. Not only do late L1 learners typically not recover from initial stages of deficient L1 acquisition, they also appear to be handicapped in their attempt to master second languages. In contrast, normal L1 exposure equips the language acquisition mechanisms for successful L2 learning. This conclusion is based on findings from the assessment of L1 and L2 learners in both modalities, sign and spoken, and of early learners and late learners (Mayberry, 2007; Boudreault and Mayberry, 2006). Corroborating evidence for the essential/foundational status of early L1 comes from reports of rapid RL development in young children abruptly separated from their L1 environment (Nicoladis and Grabis, 2002). All of these findings are consistent with the hypothesis presented earlier from a number of investigators, that the LAD is maintained undiminished upon attainment of L1 completeness. Actual loss of the language acquisition capacity would be then restricted to the aftermath of late, abnormal, L1 learning (or other type of trauma); only under this condition would it be rendered defective (presumably, in part).

In their study of brain imaging of language plasticity, Pallier, Colomé and Sebastián-Gallés (2001) ask: Can a second language replace the first? Their subsequent discussion of AoA effects and the concept of a critical period links Mayberry's results from the study of *impaired* development to the situation of *normal* child L1 attrition, the latter always concurrent with replacement. The Pallier et al. findings also represent an antecedent to the L1-filter/RL-development hypothesis, elaborated upon in this paper. In regard to replacement, two proposals are counterposed: the 'crystallization hypothesis' and the 'interference hypothesis,' the latter implying that brain circuits programmed for language acquisition remain 'plastic.' Plasticity, in this sense, allows a new language subsystem to be able to "completely [override] the traces laid down by the first," (p. 155); for example, in L1 attrition the RL comes to be represented in the same domains in which the first language was represented. A parallel can be drawn between this 'interference hypothesis' and the proposal that RLs take on the status of primary language, attaining completeness. If replacement continues its course, the networks of linguistic knowledge are 'reset' (Ventureyra et al., 2004) clearing the way, so to speak, for full acquisition, again - a second time around.

Evidence against ‘crystallization’ is also consistent with the position that UG remains intact after L1 acquisition and that it participates in L2 acquisition (because of ‘plasticity’), corollary to the proposal that RLs require full access to the specialized language acquisition mechanisms if they are to attain primary language type completeness. Short of replacement, in successful L2 acquisition, what accounts for the characteristically wide variation in second language ultimate attainment is the “presence of processes and representations attuned to the first language [that act] as a filter” (p. 160), a kind of ‘interference.’ Conversely, as replacement proceeds in L1 attrition, the expanding language system ‘interferes’ with the maintenance of the attriting system.

The Pallier et al. study forms part of a larger project that has focused attention on the subtle imbalances in child bilingualism (Bosch and Sebastián-Gallés, 2001; Navarra et al., 2005; Pallier et al., 2001; Sebastián-Gallés and Bosch, 2001), presenting findings central to the present discussion, and now its conclusion. Beginning with a confirmation of previous conclusions of research on early separation of the language subsystems in child bilinguals, assessments of infants found no significant delay in discrimination capacities.<sup>5</sup> From this, we can also put into perspective two different categories of delay: (1) sustained failure to mark developmental milestones and major imbalances that indicate impairment, and (2) lesser asymmetries within the range of normal variation in language acquisition that might be related, for example, to greater processing demands associated with two languages instead of one. The latter are of great theoretical interest, but do not indicate impairment or arrested development. In addition, the question of the existence of #2 type asymmetries (e.g., the early divergence between dominant and non-dominant languages) should be independent of the question of early separation of  $L_a$  and  $L_b$ . That is, these imbalances do not stand as evidence against the autonomous representation of each language in young children; for further discussion, see Bosch and Sebastián-Gallés (2001) and also Yip and Mathews (2007).

Working with Spanish-Catalan bilinguals, the factor of the L1-filter, or L1 ‘sieve’ (Navarra et al., 2005), presents itself as an important model-building concept for future research. Even in highly proficient adult bilinguals with early intensive childhood exposure to Catalan, Spanish dominance can be revealed in the way that the speech signal is segmented, similarly to the way that Spanish monolinguals perceive Catalan contrasts (Pallier et al., 2001). Crucially, among bilingual infants there is also a tendency for some measure of priority to be given to a dominant subsystem. Catalan-dominant infants show the same preference pattern as Catalan monolinguals even though there is an important difference, quantitatively, in the amount of exposure to Catalan. In contrast, the relatively small difference in exposure between the Catalan-dominant and Spanish-dominant bilingual children correlated with a qualitatively different pattern of sensitivity to phonotactic patterns (Sebastián-Gallés, 2001, pp. 384-385). The authors suggest that these results pose a challenge to the view that sufficiently intense exposure to a ‘second language’ early enough in early childhood should suffice to ensure the same native-like competence level that characterizes primary languages. The question for research is: in a given domain of linguistic knowledge, given sufficient exposure in  $L_a$  and  $L_b$  (see Table 1), is native-like competence *ensured* in both or only in one of the bilingual child's languages?

## 5. Conclusion

The ideal balanced bilingual speaker is an important and necessary starting point for conceptualizing a research program in child bilingualism and for carrying out the right experiments and other kinds of study. In addition, in real life, many bilingual children actually approach and attain this equilibrium (an interesting theoretical problem in these cases is to explain why, language impairment aside, a balanced bilingualism must also be a dual completeness). On the other hand, it appears that the various conditions of disequilibrium in bilingualism have turned out to be singularly revealing of the underlying structure of the knowledge of two languages and how they develop. In fact, research findings from the sharpest and most profound imbalances in language development seem to have opened the widest window on these objects of study that are normally so hard to observe (Goldin-Meadow, 2005; Law et al., 2005; Mayberry, 2007; Paradis, 2004; Senghas et al., 2008). In this way, accounting for both balanced and non-balanced bilingualism within the same conceptual framework presents itself as one of the most important goals of future research.

A promising way forward would be to focus in on the interaction between the external imbalances in patterns of language use and the inherent asymmetries of the bilingual mental architecture together with the internal developmental imbalances of dual language acquisition; see Myers-Scotton (2004, 2006) for one possible framework for this research. The different patterns of language mixing and codeswitching in early childhood, for example, should provide evidence for both balanced and non-balanced development under the different circumstances of the interaction between external and FL-internal factors. This kind of approach to the basic research questions should also lend itself to serving research on the applied problems because neither the external nor the internal factors should be neglected in trying to better understand changes in early, middle and late child bilingual ability.

## Notes

1. While the notion of *ability* as incorporating language knowledge and processing, adopted in this paper, differs from the traditional dichotomy between competence and performance, it has nothing in common with any of the various holistic/integrativist views on this question that reject outright any distinction. Holistic/integrativist approaches to the study of bilingualism are often associated with so called ‘multicompetence’ models (Hall et al., 2006; Jessner, 2008). As an anonymous reviewer pointed out, the construct of ability as presented here may also be inconsistent with mainstream UG (not just differing). This assessment may in fact be correct. The author of this paper has found many discussions of competence and performance (and of “i-language” and “e-language”) to be somewhat confusing, especially as these concepts are applied to bilingualism.

2. Among most authors in the applied fields, and especially among bilingual practitioners, the categories dominant and non-dominant typically assume internal differentiations, actual properties of the bilingual mental architecture that are potentially measurable (indices of either processing/skill or competence). A different sense of

‘dominance’ is used in Argyri and Sorace (2007) in which it appears to refer to differences in language use patterns and exposure. In this paper, the term Disfavored Language will refer to the language that children are exposed to less frequently and which is used for communication at a lower level or less often. The idea here is to avoid the implication that balanced or unbalanced external experiential factors determine actual bilingual ability or competence in a straightforward way. (The intention of the authors was not to imply this either.)

3. The idea of thresholds and interlinguistic imbalance presented in Sub-section 2.1 discards the possibility of a stable ‘incomplete’ competence in both  $L_a$  and  $L_b$  in normally developing children. For example, it would differ from models of semi-lingual speaker or “incomplete learner” (Montrul, 2004, Figure 1), except in cases of language impairment. True ‘semi-lingualism,’ therefore, is proposed to apply only to abnormal L1 learning outside the limits of the critical period (or to trauma/inherent deficit). An example of such highly restricted input conditions would be late exposure to sign language for deaf children who fail to surpass an incomplete and deficient linguistic system in either their spoken or sign languages. For our purposes, in evaluating ‘completeness’ in bilingualism, it is the mental grammar of each linguistic subsystem that should be relevant, not an external ‘dictionary grammar.’

4. The concept of encapsulation of the LAD against non-linguistic external constraints related to social inequalities, language prejudice, etc. (its robustness in the face of even extreme conditions of disfavor), was highlighted for us in our work with bilingual children who speak an indigenous language (Francis & Navarrete Gómez, 2003). The core grammar of the DL is affected, cognitively/linguistically, only under the concurrent influence of an emerging dominant language system (of the RL-type).

5. There is a need here to clarify and reconcile the finding of early separation of the linguistic subsystems and the model of bilingualism in which it is proposed that there is one universal syntax, a single computational system, shared in common between  $L1/L_a$  and  $L2/L_b$  (Bernardini and Schlyter, 2004, referencing MacSwan, 2000). In what way, precisely, do bilingual children with uneven development “project more syntactic structure in the Stronger Language than in their Weaker Language,” and how is it in this imbalance that “the Weaker Language has less developed structure” (Bernardini and Schlyter, 2004, p. 50)? According to the authors, differentiation between the language systems resides in, or derives from, separate lexicons; and separation is the “result of different features in the different syntaxes projected by the lexicons” (p. 52). What is meant then by ‘different syntaxes’; are they language-specific (autonomous and separable) or integrated into a single unified structure?

## **References**

Allen, S. E. M., 2006. Formalism and Functionalism Working Together? Exploring Roles for Complementary Contributions in the Domain of Child Null Arguments. In: Salbakova, R., Montrul, S., Prévost, P. (Eds.), *Inquiries in linguistic development: In honor of Lydia White*, John Benjamins, Amsterdam, pp. 233-255.

- Allen, S. E. M., Crago, M., Pesco, D., 2006. The Effect of Majority Language Exposure on Minority Language Skills: The Case of Inuktitut. *International Journal of Bilingual Education and Bilingualism* 9, 578-596.
- Anderson, R. T., 2001. Lexical Morphology and Verb Use in Child First Language Loss: A Preliminary Case Study Investigation. *International Journal of Bilingualism* 5, 377-401.
- Anderson, S. & Lightfoot, D., 2002. *The Language organ: Linguistics as a cognitive physiology*. Cambridge University Press, Cambridge.
- Argyri, E., Sorace, A., 2007. Crosslinguistic Influence and Language Dominance in Older Bilingual Children. *Bilingualism: Language and Cognition* 10, 79-99.
- Bernardini, P., Schlyter, S., 2004. Growing Syntactic Structure and Code-Mixing in the Weaker Language: The Ivy Hypothesis. *Bilingualism: Language and Cognition* 7, 49-69.
- Bialystok, E., 2007. Cognitive Effects of Bilingualism: How Linguistic Experience Leads to Cognitive Change. *International Journal of Bilingual Education and Bilingualism* 10, 210-223.
- Bley-Vroman, R., 1996. What We Have to Explain in Foreign Language Learning. *Behavioral and Brain Sciences* 19, 718.
- Bolonyai, A., 1998. In-Between Languages: Language Shift/Maintenance in Childhood Bilingualism. *International Journal of Bilingualism* 2, 21-43.
- Bolonyai, A., 2007. (In)Vulnerable Agreement in Incomplete Bilingual L1 Learners. *International Journal of Bilingualism* 11, 3-23.
- Bosch, L. & Sebastián-Gallés, N., 2001. Early Language Differentiation in Bilingual Infants. In Cenoz, J., Genesee, F. (Eds.), *Trends in bilingual acquisition*, John Benjamins, Amsterdam, pp. 71-93.
- Boudreault, P., Mayberry, R., 2006. Grammatical Processing in American Sign Language: Age of First-Language Effects in Relation to Syntactic Structure. *Language and Cognitive Processes* 21, 608-635.
- Clahsen, H., Felser, C., 2006. How Native-Like Is Non-Native Language Processing? *Trends in Cognitive Science* 10, 564-570.
- Clahsen, H., Muysken, P., 1996. How Adult Second Language Learning Differs from Child First Language Development. *Behavioral and Brain Sciences* 19, 721-723.

- Clark, E., 2003. Critical Periods, Time, and Practice. *University of Pennsylvania Working Papers in Linguistics* 9, 39-48.
- Crain, S., Goro, T., Thornton, R., 2006. Language Acquisition Is Language Change. *Journal of Psycholinguistic Research* 35, 31-49.
- De Houwer, A., 2007. Parental Language Input Patterns and Children's Bilingual Use. *Applied Psycholinguistics* 28, 411-424.
- DeKeyser, R., 2005. What Makes Learning Second Language Grammar Difficult? A Review of Issues. *Language Learning* 55, 1-25.
- Domínguez, L., 2007. Knowledge of Features in Fossilized Second Language Grammars. *Second Language Research* 23, 243-260.
- Dussias, P., 2004. Parsing a First Language Like a Second: The Erosion of L1 Parsing Strategies in Spanish-English Bilinguals. *International Journal of Bilingualism* 8, 355-371.
- Francis, N., 2005. Research Findings on Early First Language Attrition: Implications for the Discussion on Critical Periods in Language Acquisition. *Language Learning* 55, 491-531.
- Francis, N., 2007. Corrective Feedback in L2 Assessment: Negative Evidence and Interactive Practice. In: Leung, Y.-N. (Ed.), *Selected papers from the 16<sup>th</sup> International Symposium on English Teaching*, English Teachers' Association, Taipei, pp. 376-386.
- Francis, N., 2008. Modularity in Bilingualism as an Opportunity for Cross-Discipline Discussion. In: Cummins, J., Hornberger, N. (Eds.), *Encyclopedia of language and education: Bilingual education, Volume 5*, Springer, New York, pp. 105-116.
- Francis, N., Navarrete Gómez, P. R., 2003. Language Interaction in Nahuatl Discourse: The Influence of Spanish in Child and Adult Narratives. *Language Culture and Curriculum* 16, 1-17.
- Genesee, F., 2003. Rethinking Bilingual Acquisition. In: Dewaele, J.-M., Housen, A., Wei, L. (Eds.), *Bilingualism: Beyond basic principles: Festschrift in honor of Hugo Baetens Beardsmore*, Multilingual Matters, Clevedon, pp. 204-228.
- Goldin-Meadow, S., 2005. What Language Creation in the Manual Modality Tells Us About the Foundations of Language. *The Linguistic Review* 22, 199-225.
- Gürel, A., 2004. Selectivity in L2-Induced L1 Attrition: A Psycholinguistic Account. *Journal of Neurolinguistics* 17, 53-78.

- Hakuta, K., Bialystok, E., Wiley, E., 2003. Critical Evidence: A Test of the Critical-Period Hypothesis for Second-Language Acquisition. *Psychological Science* 14, 31-38.
- Hall, J. K., Cheng, A., Carlson, M. T., 2006. Reconceptualizing Multicompetence as a Theory of Language Knowledge. *Applied Linguistics* 27, 220-240.
- Halmari, H., 2005. 'I'm Forgetting Both': L1 Maintenance and Codeswitching in Finnish-English Language Contact. *International Journal of Bilingualism* 9, 197-433.
- Han, Z.-H., 2004. Fossilization: Five Central Issues. *International Journal of Applied Linguistics* 14, 212-239.
- Herschensohn, J.; Stevenson, J., Waltmunson, J., 2005. Children's Acquisition of L2 Spanish Morphosyntax in an Immersion Setting. *International Review of Applied Linguistics* 43, 193-217.
- Jackendoff, R., 2007. *Language, consciousness, culture: Essays on mental structure*. MIT Press, Cambridge.
- Jessner, U., 2008. Multicompetence Approaches to Language Proficiency Development in Multilingual Education. In: Cummins, J., Hornberger, N. (Eds.), *Encyclopedia of language and education: Bilingual education, Volume 5*, Springer, New York, pp. 91-104.
- Kaufman, D., 1998. Children's Assimilatory Pattern and L1 Attrition. In: Greenhill, A., Hughes, M., Littlefield, H., Walsh, H. (Eds.), *Proceedings of the 22<sup>nd</sup> Annual Boston University Conference on Language Development*, Cascadilla Press, Somerville, MA, pp. 409-420.
- Kaufman, D., 2001. Tales of L1 Attrition - Evidence from Pre-Puberty Children. In: Ammerlaan, T., Hulsen, M., Strating, H., Yagmur, K. (Eds.), *Sociolinguistic and psycholinguistic perspectives on maintenance and loss of minority languages*, Waxmann, Münster, pp. 185-202.
- Köpke, B., 2004. Neurolinguistic Aspects of Attrition. *Journal of Neurolinguistics* 17, 3-30.
- Köpke, B. & Schmid, M., 2004. Language Attrition: The Next Phase. In: Schmid, M., Köpke, B., Keijzer, M., Weilemar, L. (Eds.), *First language attrition: Interdisciplinary perspectives on methodological issues*, John Benjamins, Amsterdam, pp. 1-43.
- Law, S.-P., Wong, W., Chiu, K. M. Y., 2005. Preserved Reading Aloud with Semantic Deficits: Evidence for a Non-Semantic Lexical Route for Reading Chinese. *Neurocase* 11, 167-175.

- Levy, B., McVeigh, N., Marful, A., Anderson, M., 2007. Inhibiting your Native Language: The Role of Retrieval-Induced Forgetting during Second Language Acquisition. *Psychological Science* 18, 29-34.
- Lightfoot, D., 1999. *The Development of language: Acquisition, change, and evolution*. Blackwell Publishers, Oxford.
- MacSwan, J., 2000. The Architecture of the Bilingual Language Faculty: Evidence from Intrasentential Codeswitching. *Bilingualism: Language and Cognition* 3, 37-54.
- MacSwan, J., Pray, L., 2005. Learning English Bilingually: Age of Onset Of Exposure and Rate of Acquisition among English Language Learners in a Bilingual Education Program. *Bilingual Research Journal* 29, 653-678.
- MacWhinney, B., 2005. Extending the competition model. *International Journal of Bilingualism* 9, 69-84.
- Mayberry, R., 2007. When Timing Is Everything: Age of First-Language Acquisition Effects on Second-Language Learning. *Applied Psycholinguistics* 28, 537-549.
- Meisel, J., 2004. The Bilingual Child. In: Bhatia, T., Ritchie, W.R. (Eds.), *The Handbook of bilingualism*, Blackwell, Oxford, pp. 91-113.
- Meisel, J., 2007. The Weaker Language in Early Child Bilingualism: Acquiring a First Language as a Second Language. *Applied Psycholinguistics* 28, 495-514.
- Montrul, S., 2004. Convergent Outcomes in L2 Acquisition and L1 Loss. In: Schmid, M., Köpcke, B., Keijzer, M. & Weilemar, L. (Eds.), *First language attrition: Interdisciplinary perspectives on methodological issues*, John Benjamins, Amsterdam, pp. 259-279.
- Montrul, S., 2005. Second Language Acquisition and First Language Loss in Adult Early Bilinguals: Exploring Some Differences and Similarities. *Second Language Research* 21, 199-249.
- Montrul, S., 2006. Incomplete Acquisition as a Feature of Bilingual and L2 Grammars. In: Slabakova, R., Montrul, S., Prévost, P. (Eds.), *Inquiries in linguistic development: In honor of Lydia White*, John Benjamins, Amsterdam, pp. 335-359.
- Myers-Scotton, C., 2004. Precision Tuning of the Matrix Language Frame (MLF) Model of Codeswitching. *Sociolinguistica* 18, 106-117.
- Myers-Scotton, C., 2006. *Multiple voices: An introduction to bilingualism*. Blackwell, Oxford.

- Navarra, J., Sebastián-Gallés, N., Soto-Faraco, S., 2005. The Perception of Second Language Sounds in Early Bilinguals: New Evidence from an Implicit Measure. *Journal of Experimental Psychology* 31, 912-918.
- Nicoladis, E., Grabois, H., 2002. Learning English and Losing Chinese: A Case Study of a Child Adopted from China. *International Journal of Bilingualism* 6, 441-454.
- Pallier, C., Colomé, A., Sebastián-Gallés, N., 2001. The Influence of Native-Language Phonology on Lexical Access. *Psychological Science* 12, 445-449.
- Paradis, M., 2004. *A Neurolinguistic theory of bilingualism*. John Benjamins, Amsterdam.
- Paradis, J., Crago, M., Genesee, F., 2005. Domain-General Versus Domain-Specific Accounts of Specific Language Impairment: Evidence from Bilingual Children's Acquisition of Object Pronouns. *Language Acquisition* 13, 33-62.
- Pettito, L., Katerelos, M., Levy, B. G., Gauna, K. Tétreault, K., Ferraro, V., 2001. Bilingual Signed and Spoken Language Acquisition from Birth: Implications for the Mechanisms Underlying Early Bilingual Language Acquisition. *Journal of Child Language* 28, 453-496.
- Pettito, L., Holowka, S., 2002. Evaluating Attributions of Delay and Confusion in Young Bilinguals: Special Insights from Infants Acquiring a Signed and a Spoken Language. *Sign Language Studies* 3, 4-33.
- Pfaff, C., 1999. Changing patterns of language mixing in a bilingual child. In G. Extra and L. Verhoeven (eds.), *Bilingualism and migration*, Mouton de Gruyter, New York, pp. 97-121.
- Pinker, S., 1990. Language Acquisition. In: Osherson, D., Lasnik, H. (Eds.), *Language: An invitation to cognitive science*, MIT Press, Cambridge, pp. 199-241.
- Pinker, S., 2004. Clarifying the Logical Problem of Language Acquisition. *Journal Of Child Language* 31, 949-953.
- Schachter, J., 1996. Maturation and the Issue of Universal Grammar in Second Language Acquisition. In: Ritchie, W. C., Bhatia, T. J. (Eds.), *Handbook of second language acquisition*, Academic Press, New York, pp. 159-193,
- Schlyter, S., 1993. The Weaker Language in Bilingual Swedish-French Children. In: Hyltenstam, K., Viberg, A. (Eds.), *Progression and regression in language: Sociocultural, neuropsychological, and linguistic perspectives*, Cambridge University Press, Cambridge, pp. 289-308.

- Schmitt, E., 2000. The Lost Word: Language Attrition among Children. *Boston University Conference on Language Development Proceedings 24*, 645-656.
- Schwartz, B., 2003. Child L2 Acquisition: Paving the Way. *Boston University Conference on Language Development Proceedings 27*, 26-50.
- Sebastián-Gallés, N., Bosch, L., 2001. On Becoming and Being Bilingual. In: Dupoux, E. (Ed.), *Language, brain, and cognitive development: Essays in honor of Jacques Mehler*, MIT Press, Cambridge, pp. 379-393.
- Seliger, L., 1996. Primary Language Attrition in the Context of Bilingualism. In Ritchie, W., Bhatia, T. (Eds.), *Handbook of second language acquisition*, Academic Press, New York, pp. 605-625.
- Senghas, A., Kita, S., Özyürek, A., 2008. Children Creating Core Properties of Language: Evidence from an Emerging Sign Language in Nicaragua. In: Lindgren, K., DeLuca, D., Reynolds, B., Napoli, D. (Eds.), *Signs and voices*, Gallaudet University Press, Washington DC, pp. 90-99.
- Sharwood-Smith, M., Van Buren, P., 1991. First Language Attrition and the Parameter Setting Model. In: Seliger H., Vago, R. (Eds.), *First language attrition*, Cambridge University Press, Cambridge, pp. 17-30.
- Silva-Corvalán, C., 2003. Linguistic Consequences of Reduced Input in Bilingual First Language Acquisition. In: Montrul, N., Ordóñez, F. (Eds.), *Linguistic theory and language development in Hispanic languages*, Cascadia Press, Somerville, MA, pp. 375-397.
- Sorace, A., 2003. Near nativeness. In C. J. Doughty & M. H. Long (eds.), *The handbook of second language acquisition*, Blackwell Publishing, Oxford, pp. 130-151.
- Sorace, A., 2005. Selective Optionality in Language Development. In: Cornips, L., Corrigan, K. (Eds.), *Syntax and variation: Reconciling the biological and the social*, John Benjamins, Amsterdam, pp. 55-80.
- Ventureyra, V., Pallier, C., Yoo, H.-Y., 2004. The Loss of First Language Phonetic Perception in Adopted Koreans. *Journal of Neurolinguistics 17*, 79-91.
- Wexler, K., 1999. Maturation and Growth of Grammar. In: Ritchie, W., Bhatia T. (Eds.), *Handbook of child language acquisition*, Academic Press, New York, pp. 55-109.
- White, L., 2003. Fossilization in Steady State L2 Grammar: Persistent Problems with Inflectional Morphology. *Bilingualism: Language and Cognition 6*, 129-141.

Yip, V., Matthews, S., 2007. *The Bilingual child: Early development and language contact*. Cambridge University Press, Cambridge.