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Generative Approaches to Second Language (L2) Acquisition and Advanced L2 Proficiency

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This article was published as

Rothman, Jason, Fatih Bayram, Tanja Kupisch, Terje Lohndal & Marit Westergaard. 2018. 'Generative Approaches to Second Language (L2) Acquisition and Advanced L2 Proficiency.' In A. Benati & P. Malovrh (eds.), *The Handbook of Advanced Proficiency in Second Language Acquisition*, pp. 72-93. New York: Blackwell/Wiley.

Generative Approaches to Second Language (L2) Acquisition and Advanced L2 Proficiency

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Abstract:

Child first language acquisition (L1A) and adult second language acquisition (SLA) have observably different outcomes. Considering how distinct the two acquisition contexts often are, divergence is perhaps not surprising. Only adults acquiring a second language (L2) (i) are typically not surrounded by high quantities of native input, (ii) receive and must filter through significant amounts of nonnative input (e.g., from classmates), (iii) deal with crosslinguistic influence/transfer from their L1 and (iv) lack the same inherent need/intrinsic motivation to acquire an additional language as children do their first. A combination of these and/or other secondary factors might explain observable differences across groups. It is, however, also possible that differences reflect a biologically-determined cessation or weaker access to linguistic and/or cognitive learning mechanisms as a function of increased age. This chapter focuses on generative approaches to advanced proficiency and ultimate attainment potential in adult L2 acquisition where a preponderance of evidence, we will argue, does not support a biologically determined critical period specifically for universal linguistic mechanisms. The chapter also introduces the reader to newer theories within generative approaches to SLA that seek to explain discrete aspects of differences between monolingual and adult L2 at high levels of proficiency as well as individual L2 speaker variation.

Keywords: Universal Grammar (UG), Generative Approaches to SLA (GenSLA), Second Language Acquisition (SLA), Advanced Proficiency, Critical/Sensitive Periods

1. Introduction

Relatively advanced proficiency in a second language (L2) is not uncommon; however, it is quite remarkable for an adult L2 speaker to become indistinguishable from native speakers. Undoubtedly, the apparent rarity reflects actual opportunity for success. The question thus becomes what underlies “opportunity for success” in this context. This question parallels the long-standing debate surrounding the application of the Critical Period Hypothesis (Lenneberg 1967; Penfield and Roberts 1959) to adult second language acquisition (SLA). Do ubiquitous differences that characterize child first language (L1) versus adult L2 development and ultimate attainment—which no one denies—follow from a biologically-based critical period¹, after which adults are prevented from acquiring L2 competence in the same way L1 native speakers do? Is there a biologically-induced age effect—in whole or in part—for accessing/using cognitive and/or

¹ For ease of exposition and given limited space, we use the term critical period in a catchall way. That is, critical period is used herein as a proxy for either a singular absolute critical period for all domains of grammar, multiple critical periods applying at different times to distinct domains of grammar (e.g., an earlier one for phonology as compared to syntax) or even sensitive periods that apply gradually over time as opposed to a sharp critical period effect. This is because explaining the differences and the literature that debates them is peripheral to the points at hand, although we acknowledge that distinguishing between them for other important issues matters a great deal.

domain-specific linguistic mechanisms that guide language acquisition in children? Conversely, is it possible that both children and adults make use of the exact same mental (internal) mechanisms to acquire language, and that differences merely obtain as a result of extraneous factors that distinguish the learning tasks of the two sets of acquirers?

When considering the juxtaposed questions above, it is important to keep in mind what extraneous factors could be relevant and deterministic. Virtually all monolingual children (i) find themselves in an environment that inundates them with significant quantities of high-quality input from native speakers, (ii) will not have to deal with crosslinguistic influence/transfer from previously acquired languages affecting the path of development and (iii) have a primordial need to acquire at least one language to help them encode the world around them and to use it to communicate their thoughts, needs and desiderata. Alternatively, the typical adult acquiring an L2 (i) is not surrounded by quantities of native input anywhere near that of a child learning her L1, (ii) receives and must filter through significant amounts of nonnative input (e.g., from classmates), (iii) has to deal with crosslinguistic influence/transfer from her L1 that can hinder as much as it facilitates and (iv) does not have the same inherent need/intrinsic motivation for acquiring an L2 because her world is already completely encoded in linguistic terms and she can fully express herself in the L1.

It has been suggested that the above and/or other extraneous factors couple together in various constellations to explain specific subtypes of observable differences between children and adults. Such a view circumvents the need to claim that child versus adult acquisition processes are fundamentally different (e.g., Alemán Bañón, Miller and Rothman 2017; Bialystok and Hakuta 1994; Birdsong 1992; Birdsong and Flege 2000; Birdsong and Molis 2001; Bruer 1999; Epstein, Flynn and Martohardjono 1996; Flege 1999; Hakuta, Bialystok and Wiley 2003; Rothman 2008a; Schwartz and Sprouse 1996; 2013; Slabakova 2006; White 1989, 2003, 2008). In Bialystok and Hakuta's words, morphosyntax "remains accessible throughout life, even though the circumstances of our lives may muddy that access (1994: 86)". The claim is sustained by three distinct types of evidence, the first corresponding to the ageing brain in general and the second and third specifically to language acquisition/processing evidence from adults. To start, the whole notion of a critical period was originally predicated on the strong belief that the modular mind was deeply affected by loss of neurological plasticity after puberty, i.e., nonpathological, morphological changes to the structure of the adult brain affecting its ability to re-organize or re-distribute function as needed. We know now, however, that the brain remains much more malleable throughout the lifespan than previously claimed, meaning there is no sharp decline in neurological plasticity culminating around puberty (see Fuchs and Flügge 2014 for review). Evidence against (a strong version of) a critical period affecting sequential adult language acquisition comes from research showing that there are (i) very successful older learner exceptions to the general L2 acquisition outcome and (ii) significant behavioral and neurolinguistic/processing data that fail to show qualitative differences in the acquisition outcomes and/or real time processing by adults for particular domains of L2 grammar for which measurable critical period effect are predicted.

It is possible, however, that adults simply no longer have the same abilities for language acquisition as children; that is, that the linguistic and/or cognitive learning mechanisms that guide child acquisition are no longer available—at all or to the same degree—after a specific time window in (early) adulthood (e.g., Abrahamsson and Hyltenstam 2008, 2009; Bylund, Abrahamsson and Hyltenstam 2012, 2013; Bley-Vroman 1989, 2009; Clahsen and Muysken 1989; Copetiers 1987; DeKeyser 2000; Granena and Long 2013; Hawkins and Casillas 2008; Hawkins

and Chan 1997; Johnson 1992; Johnson and Newport 1989; Long 2005; Meisel 2011; Schachter 1988; Tsimpli and Dimitrakopoulou 2007). Successes in adult L2 performance are acknowledged by researchers advocating a biologically-induced age-related explanation for (some) L1 vs. L2 differences. However, performance successes within L2 domains of grammar predicted to be unacquirable in adulthood—e.g., a property that has no equivalent counterpart in the L1—are understood as byproducts of adults’ generally high ability to learn patterns and/or their metalinguistic knowledge about the L2. In such a case, the underlying mental representations in child and adult learners would be different. Such a view is fueled by at least two factors: (i) there is, in general, an inverse correlation between increasing L2 age of onset and incidence of nativelikeness overall (e.g., Abrahamson and Hyltenstam 2009) and (ii) the idea that any and all evidence of L1 vs. L2 competence/performance outcome differences provides unassailable evidence for some type of critical/sensitive period. From such a perspective, the relatively few older L2 speakers who wind up indistinguishable from natives are considered anomalies or insignificant exceptions to an otherwise generalizable rule.

If evidence of any difference between children and adults is to be equated to a critical period effect, indeed there should be no debate on the matter, since no one denies the robustness of such evidence. However, we all of course care about the qualitative nature of *why* these differences obtain. In fact, unpacking the *why* itself will ultimately adjudicate between whether or not differences we observe reflect a true critical period for adult L2 acquisition. As pointed out by Rothman (2008a), claims about critical/sensitive periods map onto a “*can versus cannot*” as opposed to a “*do versus do not*” dichotomy. Furthermore, they make both global (general) and more fine-grained predictions. The fact that most adult L2 learners *do not* wind up indistinguishable from native monolinguals does not necessarily imply that they *cannot* acquire an L2 like native monolingual children. If the underlying cause of child L1 vs. adult L2 differences truly is an outcome of biological (neurological) maturation, we could reasonably expect no exceptions at all since the claim is one of (im)possibility (neurological maturation makes it ‘*cannot*’) as opposed to predicting very low occurrence (as in typically ‘*do not*’). Global level predictions where any L1 vs. L2 difference alone constitutes proper evidence in favor of critical/sensitive period(s) are well attested in the literature. At the more fine-grained level, however, things begin to break down. In particular, successes in the acquisition of discrete domains/properties of L2 grammar predicted to be impossible at any level of L2 proficiency pose significant challenges, e.g., complete target acquisition of domains of L2 morphosyntax, especially when accompanied by nativelike subtle semantic entailments that cannot be transferred from the L1 (Schwartz and Sprouse 2013; Slabakova 2006, 2016).

In the remainder of this chapter, we entertain the above possibilities with generative approaches to SLA (GenSLA) theories in mind, questioning how deep observations of L1 vs. L2 differences go vis-à-vis data from high levels of adult L2 proficiency. To do so, we briefly introduce the main tenets of the generative paradigm as well as a cursory history of GenSLA and how they have, since the 1980s, addressed issues pertaining to advanced L2 proficiency and ultimate attainment. We argue and show that a unique type of data exclusive to GenSLA studies – specifically testing for Poverty of the Stimulus (PoS) effects in adult L2 acquisition— offers particularly strong evidence against the strong version of the Critical Period Hypothesis (e.g., Dekydtspotter, Sprouse and Swanson 2001; Dekydtspotter, Sprouse and Thyre 1999, 2000; Kanno 1997; Montrul and Slabakova 2003; Pérez-Leroux and Glass 1999; Rothman and Iverson 2008; Song and Schwartz 2009). Aligned with the position that adult SLA is “*Different? Yes. Fundamentally? No.*” (White 2008), we also introduce the reader to newer GenSLA models from

the past decade or so that, in light of compelling evidence that Universal Grammar (UG) is still operative in adulthood, seek to explain why child L1 vs. adult L2 as well as individual L2 speaker variation obtain even though there are no fundamental differences between child and adult language acquisition.

2. Main Tenets of Generative Linguistic Theory

Given the centrality of generative linguistic theorizing and its principal constructs to the GenSLA enterprise, e.g., Universal Grammar (UG) and Poverty of the Stimulus (PoS) properties, it is important that we describe what they are and what motivates the proposals before continuing further. Of course, given the general readership and space limitations, we offer a somewhat simplified account.² Akin to other brain-based modular sub-systems that require external stimuli to unfold (e.g., vision), UG is argued to be a genetically endowed blueprint to the most generalizable facts about language; that is, it contains the linguistic information that is common to all human languages, labeled *principles*. As concerns linguistic learnability, the idea is that UG fills the gap left by what is learnable based on input and domain general cognition alone. Equipped with UG, child learners are able to narrow down the search space for language learning by limiting their hypotheses about the target language from the superset of all logical possibilities to the subset UG allows; that is, only those that characterize potential human grammars. In listing *a priori* the limits on what is and what is not a possible grammar, UG has also been argued to identify and restrict the *parameters* of grammatical variation between languages (but see discussion below). Clearly, many domain-general cognitive, social, and computational principles shape linguistic development. According to the generative perspective, all these factors couple together to form and contribute to the task of organizing and making sense of input learners encounter (Rothman and Slabakova, 2017).

One well-known example of the interaction between principles and parameters is the Null Subject Parameter (NSP), (Rizzi 1982). The beauty of the original formulation of this parameter was that it assumed that grammatical properties swing in tandem (see D’Alessandro 2015 for a recent review). Null subject languages correlated with the ability to extract the subject out of a finite embedded clause headed by an overt complementizer (1), they allow for subject inversion (2) (Kayne 1980), and null subjects occur in languages with rich agreement (Taraldsen 1980). Furthermore, both referential and non-referential (expletive) null subjects are licensed, which is not the case in non-null subject languages (3).

- (1) ¿Quién₁ dijiste que *pro*_{1/2} salió temprano? (Spanish)
 who say-PRET.2.SG THAT leave-PRET.3.SG early
 ‘Who did you say that left early?’ (Perlmutter 1971:103)
- (2) a. È arrivato Gianni. (Italian)
 b. *Est arrivé Jean. (French)

² We wish to acknowledge that there is considerable debate as to what various generative theorists take to be the constitution of the innate language faculty. For some, the genetic linguistic endowment is truly minimal, perhaps only containing a single, overarching core operation that is truly domain-specific to language such as (recursive) *Merge* (e.g., Yang, Crain, Berwick, Chomsky and Bolhuis 2017) or a more generalized conception of syntactic recursion (e.g., Hauser, Chomsky and Fitch 2002). For others, the genetic endowment could not be so reductionist in light of non-recursive elements of language (phonology, morphology and specific elements of syntax itself, for example) that seemingly cannot be explained as being specific to humans but not to language (they cannot follow from domain-general cognition) or not being specific to humans (they are attested in other animals, especially primate species) (e.g., Pinker and Jackendoff 2005).

- c. *Has arrived John. (English) (Roberts 2007: 28)
- (3) a. It rains frequently in April.
 b. **pro* rains frequently in April.
 c. *Ello/Lo llueve a menudo en abril. (Spanish)
 d. *pro* llueve a menudo en abril.
 ‘It rains frequently in April.’ (Judy and Rothman 2010: 200-201)

A further property was added to this cluster by Montalbetti (1984). Consider the following data from Judy and Rothman (2010: 202).

- (4) a. La niña₁ cree que ella_{1/2} es la más inteligente. (Spanish)
 b. La niña₁ cree que *pro*_{1/2} es la más inteligente.
 ‘The girl thinks that she/*pro* is the smartest.
 c. ¿Quién₁ cree que ella *_{1/2} es la más inteligente?
 d. ¿Quién₁ cree que *pro*_{1/2} es la más inteligente?
 ‘Who thinks that she/*pro* is the smartest?’

The data show that in Spanish, embedded null subjects have no absolute constraints for co-reference (see 4b and 4d). However, it is not possible for a variable overt embedded subject (quantified DPs or *Wh*-words) to be co-referential with the matrix clause subject, although in general co-reference between a non-variable overt embedded subject (all other types of DPs/NPs) and the matrix subject is in principle possible (compare 4a-4c). That is, overt pronouns cannot be interpreted as bound variables, unlike *pro*. Montalbetti stated this as the following generalization and named it the Overt Pronoun Constraint (OPC).

- (5) A bound variable interpretation of an overt pronoun is prohibited if *pro* is available in the same position.

English is then predicted to be different, since overt pronouns (the only ones applicable to English) can easily serve as bound variables.

- (6) Who₁ thinks she_{1/2} is the brightest?

Knowledge represented by the OPC embodies an instance of PoS (more on this below). Evidence that (5) applies is not present in the input to the child, and it is not likely that it can be inferred from the available input either.

A particularly important aspect of the parametric line of thinking was to link easy-to-observe properties with hard-to-observe properties. For the *pro*-drop parameter, we see this in how extraction out of a finite embedded clause with an overt complementizer is linked to whether or not null subjects are allowed. It is easy for the child to observe whether or not null subjects are allowed, but it is not equally easy to observe the relevant restrictions on extraction. However, much work since the early 1980s has questioned the particular clustering that Rizzi (1982) argued for (see, among others, Haspelmath 2008, Jaeggli and Hyams 1988, Newmeyer 2005, Rothman and Iverson 2007; Rothman, 2009). Baker (2008: 352) states that “[h]istory has not been kind to the *Pro*-drop Parameter as originally stated”. Nevertheless, it serves as a good illustration of the original idea. Today, parameters are increasingly seen as emergent properties and not pre-defined

by UG as such; only their format is (see e.g., Biberauer and Roberts 2012, Westergaard 2009, 2014).

Generative approaches to language acquisition have always been propelled by what is referred to as the logical problem of language acquisition. All typically developing children will be able to acquire language effortlessly despite input, overall, being impoverished or inconsistent at times. This suggests that language acquisition is guided by certain principles that are unique to language. Chomsky has always argued that there are innate principles specific to language that enable the child to acquire whatever language she is exposed to (see e.g., Chomsky 1965, 1971, 1981, 1986, 1995; see also Fodor 1983, Pinker 1995). Support for domain-specific linguistic knowledge comes from the PoS argument (see Berwick, Pietroski, Yankama and Chomsky 2011; Schwartz and Sprouse 2000, 2013 for updated reviews of PoS in general and its applicability to L2 acquisition). In essence, PoS concerns restrictions on structures in a given grammar that cannot possibly be derived from the input. PoS properties are argued to reflect "the innate schematism of mind that is applied to the data of experience" that, because there is no relevant information in the input to explain the resulting knowledge, "might reasonably be attributed to the organism itself as its contribution to the task of the acquisition of [linguistic] knowledge" (Chomsky 1971: 26). Put differently, the input is insufficient in two senses: In *scope* since the input cannot provide evidence about all possible sentences that the child will encounter, and in *quality* because the input itself does not contain information about the kinds of representations that should be used in building a generative grammar of the language. The logic consists of the following steps, here based on Pullum and Scholz (2002: 18).

- (7) a. Speakers acquire some aspect of grammatical representation.
- b. The data the child is exposed to is consistent with multiple representations.
- c. There is data that could be defined that would distinguish the true representation from the alternatives.
- d. The data do not exist in the primary linguistic data.
- e. Conclusion: The aspect of grammatical representation acquired in (a) is not determined by experience but by properties internal to the learner.

Space limitations prevent us from discussing the full range of evidence showing there are many such PoS instances with which children (and adults) are confronted. For a useful recent discussion, however, we direct the reader to Lasnik and Lidz (2017) for the case of L1 acquisition and Schwartz and Sprouse 2013 (as well as our discussion below) for how PoS also extends to the context of SLA.

3. Generative Approaches to L2 Ultimate Attainment

The main focus of GenSLA has always been on describing and explaining the underlying second language (L2) grammar; that is, how the non-native grammar develops and ultimately manifests itself in mind/brain representations. A principled leitmotif of GenSLA studies, especially true in the first decades of its tradition (commencing in the early 1980s), sought to understand the interplay between universal knowledge (the role of/accessibility to UG in adulthood), knowledge that (potentially) comes from previous linguistic experience (L1 transfer) and knowledge that must have come from exposure to the target L2 (e.g., specific morphology and lexis). It is fair to say that the field of GenSLA started with a single main question: Do adult learners (post-puberty) continue to access UG as they acquire a second language? A second foregrounding question was

soon added in parallel: What is the role of the L1 (transfer) in the process of second language acquisition? Both questions are of crucial importance and highly connected to one another; in fact, data needed to answer the first question are likely conditioned by the answer to the second. Given that the focus of this chapter, and indeed the entire handbook, is on advanced proficiency and ultimate attainment, it is prudent to point out that answers to each of the core queries also delimit the predictions for ultimate attainment. If it is the case that UG is inaccessible after the critical period, for example, then it would mean that particular L2 representations in adult acquired grammars are destined to be fundamentally different from L1 monolingual representations. Equally, if transfer from the L1 is prolific, if not complete, then this too would affect the entirety of the learning task for L2 acquisition and delimit the end result of the process. It would also partially predict what would be easier and more difficult to converge on— properties that are underlyingly the same between the L1 and L2 being easier, for example. Transfer would also account for some seeming successes without accessibility to UG in cases where knowledge could be transferred from the L1.

In this section, we will primarily refer to GenSLA research being conducted on advanced L2 learners and what, stemming from such research with this proficiency group, motivated the need for expansion beyond the two foregrounding questions. Before doing so, however, it is useful to remind the reader that the generative approach—any cognitive or other paradigmatic approach to SLA really—does not intend to address all questions worthy of serious consideration and investigation pertinent to SLA broadly speaking. For example, GenSLA, like connectionist/emergentist approaches, is not principally concerned with second language *instruction*, even though it might be able to offer insights to it and use data from instructed SLA to inform its theories (see Rothman and Slabakova 2017). It is also useful to recognize that the main questions that pushed the GenSLA field forward in its beginning are partially theory internal, starting from the presupposition that there is an innate, domain-specific component to language, minimally operative in child language acquisition. As a result, much research has focused on providing answers to the question of UG accessibility in adulthood, which might at first glance appear irrelevant for researchers unconvinced by the necessity of a domain-specific linguistic module in the first place. Notwithstanding the potential answer to the theory internal question of UG accessibility that studying discrete domains of L2 grammar can provide, the data themselves stand apart from the theory-specific question and are thus universally relevant. Collectively after 30 plus years, GenSLA studies provide a wealth of L2 data from corpora and very well designed experiments across an impressive array of grammatical properties and L1/L2 language combinations. The facts that such data represent must be explained parsimoniously by all theories claiming to cover the development and ultimate attainment of non-native grammars.

3.1 Access to Universal Grammar

Indeed, the most important research question of GenSLA during the 1980s through the late 1990s pondered whether or not UG was still accessible to adult learners. In the first iterations of this question early on, the answers were presented as dichotomous choices between “yes” and “no”, echoing most directly the Critical Period (CP) Hypothesis debates at the time. In other words, the generative linguistic equivalent to the critical period was essentially maturationally conditioned inaccessibility to UG. Degrees of success in L2 acquisition were not easily accommodated by the dichotomous choice. While it was taken as given that UG was operable in early child language

acquisition (L1, L2, L3/Ln)³, determining whether adults indeed had continued access to UG or not was contentiously debated (e.g., Bley-Vroman 1989; Clahsen and Muysken 1986, 1989; Flynn 1987; Schachter 1988; Schwartz 1987; White 1989). UG inaccessibility claims from this era were critiqued for potentially jumping to premature conclusions based on limited types of data, primarily global differences between L1 and L2 developmental sequences and/or ultimate attainment. Early work taking a “no UG access” position had not yet fully considered the role that L1 transfer and other extraneous factors might play in obscuring any straightforward interpretation of L1/L2 differences. In the context of ultimate attainment and the very ability to achieve truly nativelike knowledge of an L2, from a generative perspective at least, the answer to this debate is crucial in determining whether or not an L2 can in principle be fully acquired.

Some of the best, if not unassailable, evidence that accessibility to UG does not suffer from a critical period is L2 Poverty of the Stimulus (PoS) competence: Some advanced L2 learners exhibit highly specific knowledge of linguistic restrictions that could not have been transferred from the L1, whose acquisition based on cues from the L2 input is seemingly impossible, and which is not taught in L2 classrooms (see Schwartz and Sprouse, 2013 for review). This type of evidence is left unexplained by domain-general cognitive considerations. Starting in the 1990s, a shift in GenSLA research occurred whereby probing directly for L2 learner PoS properties took center stage, mostly examining advanced stages of L2 proficiency. Kanno (1997), Pérez-Leroux and Glass (1999), Dekydtspotter, Sprouse and Anderson (1997), Dekydtspotter and Sprouse (2001), Rothman and Iverson (2008) among many others since, have shown that L2 grammars, despite significant differences from L1 grammars, are characterized by PoS effects, especially at advanced levels of proficiency.

Even in light of such evidence in significant quantities across many language pairings, there is no consensus in GenSLA that adults have direct access to all of UG; that is, the entirety of what UG provides to children. For example, Tsimpli and Dimitrakopoulou (2007) and Hawkins and Casillas (2008) take the position that while UG is indeed accessible in adulthood, all of the universal features it provides are not. According to both, only interpretable features—those with meaning (semantic) content—remain accessible, while uninterpretable ones—those relevant to (functional) syntactic operations, e.g., a feature that results in movement—are no longer available from UG and thus will not be instantiated in L2 grammars unless they can be transferred from the L1. Such proposals still predict that even at the most advanced stages of L2 development, L1 and L2 grammars will reflect some fundamental differences in representation. However, what will be unacquirable is significantly reduced in comparison to what was claimed by theories of inevitable representational differences from the 1980s and 1990s. Under current accounts, at least some differences between adults and children must be explained on the basis of something other than UG (in)accessibility.

3.2 The role of L1 Transfer

Despite UG accessibility (in whole or in part), there is no question that developmental path and ultimate attainment in adult L2 acquisition are observably different from child L1 acquisition. If it were the case that L1 transfer alone could explain all or most of the differences, then the second main line of query historically within GenSLA, that of determining the type, scope and extent of L1 transfer effects, would provide sufficient explanation for the ubiquitous variation in SLA. It is clear that L1 transfer changes the overall learning task for adult L2ers, and it should

³ See Meisel (2011) for a more strict age-related divide between child and adult L2 acquisition with a cutoff age for fundamental differences for some domains of grammar (e.g., grammatical gender), argued to be as early as age 3-4.

therefore not be surprising that child L1 and adult L2 developmental sequences differ. L1 transfer does explain a good amount of L2 variation, but certainly not all --. Moreover, simultaneous bilinguals, i.e., child learners with two first languages, may also show acquisition orders that differ from those of monolinguals, which invalidates diverging acquisition orders as a diagnostic of critical period effects.

To highlight the explanatory value of L1 transfer as a main variable of difference, let us consider a classic example of this within an approach to L2 acquisition as parameter resetting. In section 2 we discussed the Null Subject Parameter (NSP), which refers to the difference between languages like English, German and Norwegian, which require the subject position be overtly filled, and languages like Spanish, Turkish and Arabic, which allow for subjects to be either null or overtly expressed. At the initial state of L1 acquisition, parametric values are by definition underspecified, and any universally conditioned outcome (i.e., parameter settings or values) is equally available until exposure to a specific language (the L1) provides the child with sufficient evidence to choose the correct value pertaining to the target language. A child exposed to Spanish, for example, simply has to match one of the values of the NSP with the input of her exposure. Hearing a plurality of sentences in which there is no overt subject will lead her straightforwardly to the conclusion that Spanish is positively valued for the NSP. Alternatively, a child exposed to English does not hear sentences in which the subject position is ostensibly empty and therefore sets the parameter value to the minus setting.

To the extent that L1 transfer obtains, the learning task for an L1 Spanish learner of L2 English and for an L1 English learner of L2 Spanish for the NSP is not nearly as straightforward as that of a child, nor are they equal to each other because the directionality of acquisition itself can also delimit the L2 learning task (White 1985). A transferred L1 value means that parametric settings are already fully specified from the beginning of L2 acquisition, whereas in the case of child L1 they are by definition unspecified. Thus, the earliest stages of the L2 interlanguage are already specifically valued and this will not match the target input. The learning task is considerably more challenging than what the child has to do because the L2 learners need to undo and construct as opposed to simply construct. Moreover, as it turns out, not all “undoing” is equal. In the case of L1 English→ L2 Spanish, the task is relatively uncomplicated and much closer to that of a child monolingual than in the L1 Spanish→ L2 English direction. This is the case because re-setting the parameter value in the former case requires expansion from a smaller (subset) value to the larger (superset) value, whereas the latter requires reconfiguration from a larger value to a more restricted (or subset) grammar. Spanish is considered to be the superset grammar because it allows the English requirement—overt expression of subjects—but, unlike English, also allows sentences with a null subject, provided that discourse requirements are met. Following from the Subset Principle (Manzini and Wexler 1987), it is easier to expand a grammar than it is to reduce one from a setting that is too large. This is the case because there potentially would not be enough evidence to motivate grammatical restructuring in the superset→ subset direction (i.e., cues that lead to choosing one setting over another might not be identifiable by the parser as a result). An English speaker exposed to L2 Spanish will be confronted with a plurality of utterances that the transferred L1 value cannot handle (sentences with null subjects). In the case of Spanish natives exposed to L2 English, on the other hand, there will be fewer relevant parsing failures, as Spanish also allows sentences with overt subjects. The NSP is likely the most well documented parameter to have been studied in GenSLA over the past three decades, and L1 English→ L2 Spanish is probably the most studied language pair. Work by Phinney (1987), Hilles (1986), Judy and Rothman (2010) and Judy (2011) examined the opposite direction (L1 Spanish→ L2 English), and

in some cases they compared and contrasted both directions under the same methodology. Whereas most work on L1 English→ L2 Spanish have found evidence for early L2 acquisition of null subjects, the opposite direction does not fare as well. Earlier work by Phinney (1987) and Hilles (1986) already showed an advantage for the English→ Spanish direction. Judy (2011) shows that although L1 Spanish speakers who are near-native L2 English speakers are quite good at rejecting referential null subjects in English overall, they are not nearly as good at rejecting ungrammatical null expletives. Judy's explanation is that the transferred L1 value either cannot be re-set due to its subset-superset relationship in this direction or it is much slower to be reset than the case of English→ Spanish, as the evidence for resetting is much more subtle and thus takes longer to reach a threshold for restructuring.

The main point that this NSP example illustrates, beyond the obvious one pointing out the deterministic nature of L1 transfer, is that adult L2 learners do not all start the process of L2 acquisition at the same point. Moreover, it shows that the formal learning task for the same domain of grammar can vary considerably depending on the L1 starting point, even if all L2 learners have access to the same internal mechanisms that children do. Simply put, beginning the process with linguistic and other experiences alters the nature of the task. If L1 transfer can change the learning task, then there are likely other (experience based) variables that contribute in similar ways to overall L1/L2 differences in ultimate attainment. Examining the extent to which L1 transfer and other experiences/factors differentially manifest themselves in L2 acquisition and thus, at least partially, explain L1/L2 differences, must surely be part of all cognitive based SLA approaches. More widespread recognition of this within GenSLA since the late 1990s has spawned newer theories that seek to understand L2 variation, beyond UG accessibility and effects stemming from L1 influence. The next section is dedicated to these theories.

3.3. Beyond UG Access and L1 Transfer

By the mid 1990s it was exceedingly clear that the two main questions guiding GenSLA research would need to be significantly supplemented. Despite the observable fact that in many ways adult L2 acquisition differs from child L1 acquisition in quantitative and qualitative ways, the then twenty years of GenSLA research provided clear evidence that L2 interlanguage grammars/performances (i) instantiate abstract knowledge about the L2 that could not have been acquired on the basis of the L2 input, (ii) reflect transfer from the L1 throughout the developmental process although L1 transfer alone cannot explain all L1/L2 disparities at any snapshot stage of L2 acquisition and (iii) demonstrate that instruction and metalinguistic knowledge do affect performance, but seemingly have little effect on competence per se. However, although descriptive adequacy was high, explanatory adequacy—actually explaining how and why what was describable about L2 acquisition obtained—was far off from being achieved. The time was ripe to expand beyond the traditional foregrounding questions. That is, a critical mass of evidence from GenSLA studies (and indeed data from other paradigmatic approaches to SLA) made it clear that other variables/considerations needed to be incorporated better in GenSLA models to fully describe and explain the dynamic nature of adult L2 acquisition, especially fossilization at advanced stages of L2 proficiency. Although we would argue that GenSLA researchers have always been concerned with other variables than UG accessibility and L1 transfer effects, e.g., quantities and qualities of L2 input, differences in processing capacities between monolinguals and bilinguals, mapping difficulties between function and form and the like, it was not until the early 2000s that the call to understand the role of such variables became part of the core research program.

At the very turn of the millennium, several researchers had shifted their attention to the generally poor production of morphological paradigms in L2 acquisition, especially in otherwise very advanced and highly competent L2 learners (see Lardiere 1998a, 1998b, 2007 for a very detailed case study example). This was especially true for researchers arguing that UG still directly guides adult L2 acquisition. After all, it is incumbent on such researchers to explain how the process of adult and child acquisition can be fundamentally equivalent with respect to access to UG while the developmental processes and outcomes of acquisition are so variable for adults, yet relatively invariable for children. While there is sure to be multifarious explanations for specific subtypes of L1 vs. L2 differences—i.e., it is unlikely that there is a singular cause for all L1 vs. L2 differences—, it seemed prudent to focus on L1/L2 morphological disparities for several reasons, not the least of which was the robustness and ubiquity of the problem. The problematic case of L2 morphology is also particularly interesting because morphology is overtly and continuously taught to tutored L2 learners, it is reliably provided in available input and, depending on the specific morphemes, it may even be highly frequent. Thus, the fact that obligatory inflectional morphology—an overt phonological expression of functional syntactic categories—stands out as highly variable in adult SLA production, needed to be reconciled with (i) evidence of successes in L2 morphosyntactic PoS domains and (ii) high variability despite substantial frequency in the input and even metalinguistic knowledge.

On a theoretical level, understanding how and why L2 morphology presents such an obstacle for advanced proficiency L2 speakers was especially interesting given the assumed connection between morphology and syntactic development in the case of child L1 acquisition. Many L1 researchers at the time had been working under the assumption/proposal that overt morphology is directly linked to underlying syntax in acquisition, in fact, it was considered to be the driving force for syntactic acquisition. Failure to show consistent and stable knowledge of morphological exponents was taken to indicate lack of acquisition of an associated functional category, whereas the point of eventual stability was understood as marking acquisition of the corresponding functional category (e.g., Clahsen, Penke and Parodi 1993/1994; Radford 1990). Under an extension of this *morphology-before-syntax* account to L2 acquisition, omission and/or commission errors should be and were understood as a causal byproduct of a breakdown in the otherwise robust triggering relationship of morphology and syntax. Could it be, however, that the apparent alignment of morphology and syntax in children was essentially coincidental, by which morphology does not actually drive syntactic development? This was argued already by the Separation Hypothesis (e.g., Beard 1987, 1995). The Separation Hypothesis maintained that morphosyntactic features can be present in a grammar, as seen by various reflexes in grammatical behavior, even when the corresponding morphology is absent or variable. Evidence included, for example, the syntactic features of empty (null) categories and the variable use of overt functional morphology in distinct registers and dialects of a language heads. Potentially, adult L2 acquisition could be used to address this debate more generally. At the same time, a (newer) understanding that morphological production does not necessarily faithfully reflect the underlying syntactic representational system, if defensible on empirical grounds, might be able to parsimoniously reconcile (some) facts that otherwise sat in contradiction. And so, a *syntax-before-morphology* or a more general (partial) disassociation/separation between morphophonological output and morphosyntactic representation agenda was born in GenSLA (e.g., Lardiere 2000; Prévost and White 2000).

At the level of mere observation, L2 morphology presents rather differently than L1 morphological development. In typical child L1 acquisition, morphological issues tend to reflect

developmental errors of omission in obligatory contexts that are eventually overcome. Throughout L2 development, on the other hand, errors of both omission and commission occur, the latter being the suppliance/production of wrong morphophonological agreement (e.g., a 2nd person verbal morpheme with a 3rd person subject). Although errors of both types lessen over time, they do not disappear completely even at advanced levels of proficiency. Despite the fact that the general trend applies to all L2 learners irrespective of the L1, the status of the L1 in terms of its morphological inventory (inclusive of the syntactic features selected and bundled on its morphophonology) matters as well. That is in the domain of obligatory past inflection in English (-*ed* and its allomorphs), for example, Chinese natives produce even less overt past morphology (significantly less perhaps at the level of advanced L2 proficiency) than say German or Spanish speakers, because only the former lack such morphology in the L1 (e.g., Cabrelli Amaro, Campos-Dintrans and Rothman in press; Hawkins and Liszka 2003).

One of the first ideas put forward in the GenSLA *syntax-before-morphology* thread of research of the early 2000s is captured under the Missing Surface Inflection Hypothesis (Haznedar and Schwartz 1997; Prévost and White 2000), which basically states that morphological production even in highly advanced L2 speakers, given processing and other pressures on production, can under-represent underlying syntactic representations. Evidence in support of this would be advanced L2 learners' comprehension of functional morphology being demonstrably better than their variable production. White (2003) reviews a good deal of the relevant empirical research available at the time, showing that there is very good reason to believe that morphological productions can indeed underestimate syntactic competence. GenSLA studies continue to show this even today. Since the early 2000s, several other hypotheses have emerged, related to the same basic problem of explanation, including the Feature Reassembly Hypothesis (Lardiere 2009); the Prosodic Transfer Hypothesis (Goad and White 2004, 2006, 2009) and the Bottleneck Hypothesis (Slabakova 2008). Paralleling changes in formal linguistic theory pertaining to the role and granularity of functional features as a basic unit of linguistic representation, the Feature Reassembly Hypothesis places the L2 problem at the level of complexities inherent to configuring the right mappings of feature configurations (or bundles) to specific lexical items in the L2. The main idea is that L2 learners have access to the entire inventory of UG features, not only the ones instantiated in the L1 functional lexicon. However, assembling the features in the correct configurations might prove extremely challenging for adults, not the least because the L2 will bundle features differently than in a speaker's L1. The extent of difference in these mappings between the L1 and the target L2 represents one of the main learning tasks of L2 acquisition.

The Prosodic Transfer Hypothesis (PTH) (Goad and White 2004, 2006) follows from the same desire to try to explain why L2 morphology is such a vulnerable domain. It highlights, however, a distinct aspect to the feature mapping issue above, namely, the role that L1 phonological transfer can play in L2 morphological production. Essentially, the PTH claims that if L2 target morphology runs in disaccord to L1 constraints on phonological production (e.g., phonotactics) and/or the prosodification of the morphology to lexical words is different in the L1, then this can give rise to variation in L2 production. In other words, the underlying syntax that the morphology represents could be target-like (whether acquired during the course of L2 acquisition or simply transferred from the L1), but residual effects of L1 phonological constraints could negatively affect the production of L2 morphology. Let us consider again past tense morphological production in L2 English. We know from many studies that Chinese speakers of L2 English variably produce -*ed* in obligatory contexts (Lardiere 1998a, 1998b, 2007; Hawkins and Liszka 2003). According to the PTH, the reason for this, at the advanced level of proficiency, is not that

Chinese learners cannot acquire the uninterpretable past tense feature mapped onto *-ed* (lacking in their L1), but rather because of L1 phonological transfer. Chinese does not permit complex codas and one of the most common allomorphs of *-ed* is [kt], as in *walked*, *talked* and *stalked*. Moreover, Chinese does not have prosodic word adjunction, which is the process by which past tense morphology is adjoined to the root in English. If Goad and White are on the right track, not only would L2 speakers of English whose L1s lack past tense morphology have problems with past tense production, but indeed any learner whose L1 phonology could cause similar influence. In a recent paper, Cabrelli Amaro et al. (in press) tested this claim by comparing Chinese, Japanese and Spanish highly advanced L2 speakers of English. Although Spanish and Japanese do have the past tense feature (unlike Chinese), both languages also have the same general prohibition on complex codas, and Spanish is also lacking prosodic word adjunction. The results show that all three groups variably produce English past tense, with no differences between the rates of suppliance in Spanish and Chinese speakers. The Japanese group, while still different from the native English controls, fared better overall, which the authors attribute to them only needing to overcome phonotactic constraints, whereas the other groups had more L1 effects to deal with. Another example showing that L1 prosodic structures may affect the production of L2 morphology provided by Goad and White (2009) relates to the use of English articles by L1 Turkish speakers. According to Goad and White, L1 Turkish speakers might have problems producing articles in L2 English simply because their L1 does not provide a prosodic template for that. The result is that in certain prosodic contexts, speakers either omit articles or stress them, as word stress would allow a prosodic representation that is available in Turkish (i.e., when they use the stressed numeral *bir* ‘one’). Snape and Kupisch (2010) measured the English articles produced by an advanced L2 English L1 Turkish speaker and found that indeed many of her articles were stressed.

Taken together, the above hypotheses related to morphological variability in L2 acquisition represent the growth of GenSLA studies—the pursuit of questions that complement the original ones that shaped the first decades of the paradigm— while still following the insights from and general trends in modern generative theory. There have been many other hypotheses put forward over the last two decades within GenSLA studies whose goals are similar, to describe and explain the reality of how and why L1 and L2 manifest so differently, without assuming that observable differences must mean that the processes are fundamentally different. Space does not permit us to go over other hypotheses in great detail; however, it is worth mentioning a few here so that the interested reader can look at them in greater detail. The Competing Systems Hypothesis (Rothman 2008b), for example, highlights the possibility that in classroom SLA, the growth of a robust metalinguistic system (learning) in parallel with a system of linguistic competence (acquisition) can result in competition (in advanced learners specifically) from pedagogical rules taught that are less than accurate in linguistic terms. The Interface Hypothesis (Sorace 2011), as another example, has been highly influential in recent years. This hypothesis draws our attention to the possibility that finite processing and attention resources that must be divided in bilinguals between activating and inhibiting the two languages can give rise to residual optionality in L2 performance, even when the underlying representations are otherwise demonstrably target like.

4. Concluding remarks

This chapter started out with the observation that it is quite rare for adult L2 learners to achieve a level of proficiency that makes them indistinguishable from native speakers. Since all typically developing children do achieve native proficiency in their L1, the difference between the two populations is obvious and undisputed. One important question in GenSLA is whether the two

processes are fundamentally different, in that L1 children have access to an innate language learning mechanism (UG) that is no longer available for adults, or whether the attested differences are due to extraneous factors such as L1 transfer or lack of input and motivation. A fundamental difference would correspond to what is often formulated as a critical period for language acquisition early in life, after which there is a biologically determined cut-off point for access to the innate endowment for language. According to this view, it should be impossible for any adult learner to achieve complete native-like mastery of an L2 at a macro level as well as, at the individual level, for all adult L2 learners to acquire particular properties in the L2 (e.g. any property for which completely new L2 morphosyntactic features would need to be acquired). In this chapter, we have provided a discussion of these issues within GenSLA, taking into account certain historical changes in perspective that have gone hand in hand with developments within generative theory. Thus, while there was a focus on access to UG and the question of full, partial or no transfer within the principles and parameters approach of the 1980s and 1990s, the field has more recently moved on to consider more diverse and fine-grained issues, e.g., the mapping of functional features between the L1 and the L2 and the consistent challenges of morphology in L2 acquisition. Furthermore, there is increased focus on the effect of variables such as qualitative/quantitative input factors and processing differences.

While there is healthy discussion and considerable disagreement with respect to these issues within the field of GenSLA, we have nevertheless been clear about our own perspective. Given current knowledge, we find that there is convincing evidence that there is no biologically determined critical period for second language acquisition: Adult L2 learners have been found to acquire abstract knowledge that goes beyond the input (so-called Poverty-of-Stimulus effects), indicating that there is continued access to the language learning mechanism in adulthood. Furthermore, to our knowledge, there is no single linguistic property that has been shown to be completely unlearnable in L2 acquisition. This means that the admittedly robust and commonly attested differences between children and adults must be due to L1 transfer and other extraneous factors. Thus, while the field continues to investigate these differences in order to increase our understanding of L1 and L2 acquisition, the two processes should nevertheless be considered to be fundamentally the same.

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