

The role of Universal Grammar in second language acquisition

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Abstract

This paper discusses the question of whether Universal Grammar is relevant to the study of second language acquisition—in particular second language phonology. It will be shown that the notion of Universal Grammar has been hard to define coherently, which makes it difficult to implement it in second language acquisition research. One framework which offers a possibly explicit definition of Universal Grammar is Optimality Theory, in which phonological constraints are proposed to be universal. This makes it possible to assess the evidence for Universal Grammar directly. However, cases where Universal Grammar has been invoked to explain certain aspects of second language acquisition (in particular, errors made by second language learners) turn out to be largely spurious. The tentative conclusion must be that there is no role for Universal Grammar in second language acquisition. Arguably, this is also a better research strategy methodologically.

Keywords: Universal Grammar, second language acquisition, error analysis, Optimality Theory.

1 Introduction

Second language acquisition is a vibrant area of linguistic investigation, with many important applications. Of great importance is why second language learners make the errors that they do. Of course, error analysis is not the only or ultimate objective of second language acquisition research. For instance, some learners avoid using difficult patterns, so that some errors do not show up because they have not been made, but as a result such learners sound (or write) less natural than native speakers. Learners also show differences in speed acquiring target structures either in syntax, semantics or phonology. Still, error analysis provides insight into what L2 learners do wrong, a necessary step to develop exercises to improve. Thus, a traditional field of second language acquisition research is error analysis, to identify what factors are involved in mistakes (e.g. Corder (1967, 1981)). Some of these factors are obviously related to the learner's first language (L1), but the

*Proceedings of the first workshop "Chinese Accents and Accented Chinese" (1st CAAC) 2015,
at the Nordic Center, Fudan University, Shanghai, 9-10 October 2014.*

Eds. Marjoleine Sloos & Jeroen van de Weijer.

literature has shown that others are (see e.g. White (2003)). Sometimes such errors are attributed to universal laws or tendencies across languages, referred to as “Universal Grammar” (henceforth UG). There have been some studies in second language syntax that claim an effect of UG in this area (e.g. White (2003: Chapter 2)). In this paper we investigate the explanatory potential of Universal Grammar in second language phonology.

This paper is organised as follows: in section 2 we present a short discussion of error analysis in second language acquisition (henceforth SLA). Errors in SLA are typically attributed to a number of factors, of which UG is one. Section 3 then tries to define UG, illustrating the difficulties this concept presents. We will offer a tentative working hypothesis, based on Optimality Theory, to make the investigation of SLA more realistic. Section 4 presents a number of case studies in which UG has been invoked as a way of explaining typical SLA patterns for a number of languages. The final section points out the limitations of this study and briefly concludes.

2 Errors in second language acquisition

Second language acquisition is a path toward (near)native competence in a second (or foreign, or third) language which typically involves at least some errors. It is important to understand what causes these errors, so that adequate practice and testing material can be developed. It will also advance our understanding of the way language works, with implications for multilingualism, language loss and other areas.

In this section we will discuss the causes of errors. A number of caveats should be made. We sidestep a whole debate on what exactly constitutes an error, and we also recognise the fact that errors are not the only source of information about a learner’s progress or failures. For instance, avoidance of difficult sounds or complicated syntactic patterns also clearly plays a role in SLA (see e.g. Färch & Kasper (1984)). A learner who avoids such patterns may not show errors, but may still sound less-native because they lack patterns that are found in L₁ speakers. Finally, we focus on pronunciation errors, i.e. phonetic or phonological errors. The questions with respect to UG that are raised here can also be pursued for syntax or other linguistic subfields. We will return to this in the final section.

A first source of errors by L₂ learners is clearly the interference of L₁, also referred to as (negative) transfer, although the precise cognitive mechanisms this involves remain ill understood. The learner

will use the sounds, the segmental and suprasegmental patterns (or rules), and the structures of their native language (or another previously learned language) in the L2 (or a language learned later). For instance, a speaker whose L1 does not have an aspiration contrast (such as Dutch or French) will have difficulties with aspiration languages such as English or Chinese and typically make mistakes, for instance by not aspirating stops that should be aspirated in the L2. The literature on interference is vast (starting from Lado (1957) and Weinreich (1953) through Flege (1995) and Best (1995) up to the present day) and we will not add to this here.

A second source of errors is often identified as “Universal Grammar” in the literature (see e.g. Cook (1985), Schachter (1988), Finer (1991), Felix (1995), Thomas (2004), Liceras (2010), and, very recently, Ambridge, Pine & Lieven (2014) for support, criticism or discussion of this idea). For instance, sometimes languages lack certain structures or sounds so that they cannot be transferred to the L2 that is being learned. In this case, certain tendencies may recur in different L2s. Such cases are the focus of this paper. Consider, for instance, the L2 acquisition of a lexical tone language (such as Chinese) by a speaker whose L2 does not have lexical tone. Since there is (supposedly) nothing in the native language to compare the tones with, the learner may be subject to difficulties, and make errors, that are suffered by other L2 learners of non-tone languages too. If errors in cases like this are recurrent, they might be explained by invoking “universal” principles, and if we understand such errors better, we may again develop adequate material to avoid or repair them. Consider another example: both English and (Mandarin) Chinese have a contrast between aspirated (voiceless, or “fortis”) and non-aspirated (voiced, or “lenis”) stops. In English this contrast appears both word-initially and word-finally, but in Chinese it only occurs initially. Thus, in final position, Chinese learners of English are predicted to face difficulties and make mistakes, which is borne out by the literature (see below). These mistakes take on a number of shapes, and since they cannot be attributed to interference from the native language (since Chinese lacks word-final obstruents completely), in cases like this Universal Grammar is invoked. In other words, the fact that Chinese learners face difficulties and make errors is a fact predicted by interference, but the exact shape of the errors is not predicted by interference. If these errors are consistent, it might be predicted by a factor we refer to as Universal Grammar. We return to this case below (section 4.2).

A third source of errors include hypercorrections, e.g. the overapplication of phonological or morphological rules in the target language (see e.g. Pinker (1995)). These clearly cannot be attributed

to either interference or to Universal Grammar, but rather seem to be due to general learner strategies (rule formation), quite similar to what happens in first language acquisition.

3 What is Universal Grammar?

In this section we will discuss possible definitions of Universal Grammar. We will first discuss the more general notion of “universals”, which, purportedly, includes UG. After that we will examine some of the definitions that have been proposed in the literature and discuss this with a focus on their relevance to SLA. Finally, we will adopt a working definition by identifying UG with Optimality Theory constraints (Prince & Smolensky 1993 [2004]).

Major (2008: 76) gives a useful overview what, in his view, should be included in language universals (which, by the way, is not included as a separate entry in Brown (2006)). The list Major proposes is given in (1):

- (1) Universals:
- UG
 - learning principles
 - markedness considerations (Greenberg 1966, 1978)
 - rules
 - processes
 - constraints (Prince & Smolensky 1993 [2004])
 - stylistic universals

This is an interesting list which merits some discussion. Note that the constraints in Optimality Theory (OT; Prince & Smolensky (1993 [2004])) are supposed to supersede the “rules” and “processes” of earlier generative grammar, so, if OT is on the right track, these could be struck off the list in (1). Secondly, the content of OT’s constraints, or at least of its markedness constraints, has been identified as precisely the “markedness considerations” that were uncovered by the earlier work of Greenberg and others. The central insight of OT was to promote these “considerations” to fully-fledged principles of the grammar (see e.g. Kager (1999), who considers constraints to be part of UG, and van de Weijer (2014) for general discussion). Thus, the content of UG in the list in (1), according to Major, excludes OT constraints, although these are also universal. The question is what Major considers part of UG (he does not give a definition). Below we will return to this issue and identify OT

constraints with UG. First, we will look at a number of definitions from the literature and discuss their relevance to SLA.

An important aspect of UG appears to be its relation with typology. In a very useful exposition of the history of the concept of UG and its relation to second language acquisition, Thomas (2004) proposes the definition in (2):

(2) Thomas (2004: 2, 25)

“[U]niversal grammar consists of the linguistic properties shared by all languages”

At first glance, this definition seems largely irrelevant to SLA. Examples of linguistic properties shared by all languages might be very general properties, such that all languages have a lexicon, or a distinction between nouns and verbs, or syllable structure (however any of these terms are defined). If these are shared by all languages, then they will, by definition, be equal for an L₁ or L₂ and not affect language acquisition. Of course, difficulties arise when the syllable structure of L₁ is not the same as that of a target L₂--but in this case, the differences are not part of UG and therefore irrelevant to our question if UG is involved in SLA. It may of course be the case that there are deeper, perhaps unsuspected, linguistic properties that are shared by all languages, such as syntactic constituency, the Subjacency condition in syntax (Chomsky (1981), see discussion in White (2003: 121ff.)) or (some version of) the Obligatory Contour Principle (e.g. McCarthy (1986)) in phonology. Again, if all languages share these properties then no special predictions are made with respect to SLA. The most interesting hypothesis is the one inherent in Optimality Theory: the properties of UG are identified with OT constraints. These constraints are universal, thus exist in all languages (conforming to the definition in (2)), but they are violable: individual languages rank the constraints differently and outputs are computed on the basis of satisfaction of the constraints by different candidate forms. We will return to this possibility below.

It should be pointed out that if all languages share some particular property, this is not necessarily an argument for UG, in the sense that it must somehow be intrinsic to language (or innate). It may also be explained as a property that must emerge as a result of the fact that different languages are acquired under similar circumstances and used for similar purposes.

A second, and perhaps even more basic, aspect of UG that is often mentioned is its relation to language acquisition. In Chomsky's original work, it is observed that a first language is acquired so fast and on the basis of such poor data, that a “language acquisition device” was posited (Chomsky

1965), which, in the early proposals, contained principles and parameters: principles being inviolable principles across languages, and parameters that could differ (within boundaries) between languages (such as word order, or syllable structure). This language acquisition device was also identified with UG. The definition in (3) is from Dresher & Hornstein (1976):

(3) Dresher & Hornstein (1976: 329)

UG = “the principles according to which languages are organized and learned”

This rather opaque definition clearly applies to first language acquisition rather than second language acquisition. It is therefore not surprising that an explicit definition of UG has not been agreed upon. Chomsky recently maintains: “The concept of UG remains highly enigmatic, and appears to lie beyond the reach of contemporary inquiry” (Chomsky 2007: 24). The explanatory adequacy of the whole approach has also been questioned: “The impression that there is poverty of the stimulus leads to the conclusion that the child must be born with the constraints of UG already encoded in its brain. But UG does not explain why some violations are not found in child language: it just lists the cases as a taxonomy of principles, constraints, and parameters” (Bouchard 2013: 231). This is also a point made by Wechsler (2010: 341ff), in an investigation of a morphosemantic universal.

Returning to Major’s list of universals in (1), above we observed that it is possible to narrow down the list of universals to OT constraints, learning strategies and stylistic universals. With respect to constraints, a fundamental question is whether constraints are innate or acquired on the basis of data the child is exposed to. This question will not be discussed here but see van de Weijer (2012), van de Weijer & Sloos (2013), and van de Weijer (2014), among many others, for arguments to regard constraints as being acquired on the basis of first-language data. The fact that constraints could play a role in second language acquisition is very interesting, especially if these constraints could not have been acquired on the basis of first-language data. This would constitute strong evidence for the idea that constraints (as part of UG) are innate. Consider a language which freely allows final voiced obstruents: language learners of such a language will not posit a generalisation against final voiced obstruents following the logic of constraint acquisition (see references above). If speakers of such a language devoice final obstruents in a second language, this could be taken as evidence for the action of a constraint against final voiced obstruents – a constraint that could not have been learned on the basis of the L₁ data. In the following section, we will look at three case studies that are variations on

this theme, where evidence for a particular pattern is absent in the native language, or where second language learners even *avoid* pronunciations in their L2 that are permitted in their native language.

4 Case studies invoking UG

This section presents a number of case studies in which UG has been invoked to explain certain facts about SLA.

4.1 Chinese tones

In section 2 I noted that interference might not play a role if a language (L1) lacks certain sounds or categories of grammar which do appear in the L2 that is being acquired. An example might be lexical tone in an L2 (e.g. Chinese) where the learner's L1 does not have lexical tone (e.g. English).¹ However, of course, the phonetic property that is responsible for lexical tone in tone languages, i.e. pitch, is also used in stress languages, albeit with a different function, for instance to signal stress, intonation, and focus. These functions of pitch are expected to show lots of interference when non-tone language speakers acquire a tone language as L2. This is indeed what is found (see e.g. Wang et al. (1999)). Moreover, length and loudness are also phonetic factors that occur in both languages. In Chinese, for instance, Tone 3 is generally produced with longer duration than other tones, while Tone 4 is relatively short (Xu 1997). Speakers of English will associate these length contrasts with long and short vowels, because this is a feature they are exposed to in their native language; longer duration is associated with Tone 3 (Blicher, Diehl & Cohen 1990). Thus knowledge of English (a non-tonal language) can still interfere with tonal acquisition in Chinese. There is no clear evidence if and how UG would play a role in a case like this.

4.2 Voiced-voiceless contrast for Chinese learners of English

As is well known, standard Mandarin Chinese permits obstruents in initial position but not in final position. Wang (1995) found that in an experiment with nonsense words, Chinese learners of English replace some of the voiced obstruents with voiceless ones, as in (4):

(4) *vɪg* → *vɪk*

(This result was replicated for existing (non-nonsense) words by Qibi (2014)).

¹ Note that errors in tonal L2 acquisition usually take the form of confusion matrices (e.g. Tones 2 and 3 are often confused by L2 learners of Chinese; see e.g. Zhu (2002: Chs. 3, 4).

These results are interpreted by Broselow, Chen & Wang (1998) as “emergence of the unmarked” (TETU, see Kager (1999: Ch. 5)), since voiceless stops are cross-linguistically preferred over voiced ones in a typical neutralization position (end of the word). Chinese native phonology does not have final obstruents, and therefore not a rule of final devoicing either, so by definition the native phonology has no bearing on the question why this particular error is made. Thus, TETU refers to the (*a priori* unexpected) effect of a constraint that could not have been learned on the basis of ambient data, which is used in Optimality Theory as evidence for the potential universality (and perhaps innateness) of OT constraints.

This is an interesting case which raises the important question if the “interlanguage” (the stage at which these particular Chinese learners make these particular errors) is rule-governed (or constraint-governed) or not. If we accept the idea that all errors are outputs of actual grammars (where ‘grammars’ correspond to the mental organizations that learners have imposed on the language data to which they are exposed), then this seems a fair case of an effect of Universal Grammar, specifically a constraint like *VOICE (“No (final) voiced obstruents”). However, two facts should be noted: the error of final devoicing in the data by Wang (1995) only occurred rather infrequently: only 19% of the errors for final voiced stops involved final devoicing (Broselow, Chen & Wang 1998: 264). Errors like final epenthesis (pronouncing *bag* like a disyllable - 36%) and deletion of the final voiced obstruent (43%) were much more common. (Both of these errors can be explained by the native language phonology, since Chinese does of course allow CV syllables.) This seems rather a poor result for a putatively universal constraint; at any case the interference solutions are more common. A second option is to impute these errors to a more general factor like ease of articulation. Final voiceless stops are easier to pronounce than final voiced stops (which is, no doubt, the phonetic basis of the *VOICE constraint), so Chinese learners find these difficult and therefore make mistakes. Under this second approach, no appeal to UG is necessary and therefore seems preferable.

4.3 Korean final vowel insertion

Our final case study comes from Korean, where some loanwords from English (variably) show final vowel insertion, which is not warranted by the native Korean phonological system. This is discussed by a number of authors, among whom Rhee (2002), Kang (2003), and Boersma & Hamann (2009). Data from Kang are given in (5), indicating syllable boundaries:

- (5) bat → pæ.t^hi pad → pæ.t^hi
 deck → tɛ.k^hi gag → kæ.k^hi
 hip → hi.p^hi tube → t^hju.pɪ

Other words (not given in (5)) take no final vowel, or do so variably. Final vowel insertion is not motivated by native phonology, because final [t] is allowed in native Korean phonology (see any of the sources mentioned above). Final vowel insertion could therefore be explained by a (universal) preference for CV syllables (in OT terms, this could be captured by the constraint NOCODA). An analysis along these lines is proposed by Goad (2002) (not employing the constraint NOCODA but another OT constraint). This case is interesting and clearly different from the previous one, because Korean, unlike Mandarin Chinese, does allow final voiceless obstruents. Although these data predominantly concern loanword incorporation, they have also been reported in second language acquisition (Broselow & Kang 2013).

Rhee (2002) suggests that final vowel insertion in these data is a way for the Korean learners to preserve the contrast that is known or perceived to exist in English (*bag* vs. *back*) but which the learners cannot (yet) produce faithfully. This is also essentially the explanation offered by Kang (2003). Finally, it should, again, be pointed out, that vowel insertion does not take place consistently, so that reliance on a putative universal seems rather too strong in this case.

To conclude this section, we have (very) briefly investigated some cases where first-language interference does not seem to play a role in the errors that second language learners make. This is not necessarily an argument for a role of universal grammar (however this is defined): in all cases simpler explanations, based on simple phonetics or functional considerations, are available.

5 Conclusion

The outlook for UG in general is bleak. There is no consensus about its definition or content, which makes a workable application in a field such as second language acquisition difficult.

An obvious limitation to the case studies examined in section 4 is that they were limited to phonetics/phonology. Cases have been described in the literature that are supposed to show the operation of syntactic principles of UG (e.g. White (1989, 2003)). This may mean that UG is limited to

syntax, which would be an interesting result to contemplate further. After all, syntax is the truly generative component of language.

As to future research, it is necessary to examine more case studies where UG has been invoked to account for SLA errors (or other conspicuous patterns not identified as errors).

If UG plays no or only a minor role in SLA errors, as the discussion here and the case studies examined so far suggest, then the role of transfer is even larger than usually assumed. Research might focus on this source of errors, and underscores the importance of contrastive analysis. It is important, however, that not only transfer causes errors, but also general learning principles, e.g. those resulting in hypercorrection errors, while other factors (such as motivation) also play a role. Further study of these general cognitive principles is called for.

Finally, I wish to mention a methodological point which, in my view, is at least as important as the theoretical arguments probed above. This is that *not* relying on UG to explain errors is a sound research strategy: only if other explanations have been sought out and explored, resource could be taken to a powerful (and stipulative) mechanism such as UG. Explaining errors as a result of UG is explaining errors away, but is not really explaining.

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