

Beyond poverty: Engaging with input in generative SLA

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Abstract

A generative approach to language acquisition is no different from any other in assuming that target language input is crucial for language acquisition. This discussion note addresses the place of input in generative second language acquisition (SLA) research and the perception in the wider field of SLA research that generative SLA ‘ignores’ the input. This impression may have arisen because generative SLA researchers have tended not to systematically study quantitative distribution of input properties, nor qualitative properties of the input available to learners. We argue that precisely these sorts of studies would be at least beneficial, if not indispensable, to the development of a comprehensive (generative) theory of SLA. Furthermore, a welcome side-effect of more systematic engagement with input would be potential for greater accessibility for generative SLA in the wider field of second language (L2) studies.

Keywords

generative theory, input, second language acquisition, poverty of the stimulus, UG

I Introduction

Input is a central concern for any model of language acquisition. A generative approach is no different from any other in so far as it assumes that target language input and how learners process that input are crucial for first and second language development. It is, therefore, surprising that there seems to be a persistent notion in the wider second language acquisition (SLA) research community that generative SLA ignores input. To

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exemplify, in a recent attempt to reach out to neighbouring approaches to SLA, Slabakova et al. (2014: 603) felt it necessary, among other things, to address the charge that generative SLA ‘disregards input’. However, this was clearly not enough for de Bot (2015: 263), who in reply pilloried Slabakova and colleagues, claiming that they seemed unaware of the fact that in (what he considers) mainstream SLA ‘input is not abundant, unambiguous, and consistent, but messy, inconsistent, and ambiguous’. This seems somewhat strange as inconsistency and messiness in the input is one element in the generative assumption of the poverty of the stimulus (POS). The fact that the everyday language children are exposed to is fragmentary, containing slips of the tongue and false starts, and, crucially, positive evidence only means that it is unlikely that children could develop the subtle grammatical knowledge they finally achieve on the basis of this input alone. Of course, POS effects also extend beyond this messiness in the input. Schwartz and Sprouse (2013), for example, outline compelling arguments for the role of Universal Grammar (UG) in L2A (second language acquisition), given a range of increasingly acute POS effects.

Despite this apparent convergence on the idea of messy and ambiguous input data, it seems that there is still a perceived fundamental divergence between generative SLA and other so-called ‘mainstream’ approaches to SLA with regard to the role of input. This perceived divergence threatens to side-line generative SLA if the impression persists that it has nothing to say about input. The situation could be remedied, however, by taking a more empirical approach to input than has traditionally been the case within the generative paradigm. An empirical approach to input means collating qualitative and quantitative distributional properties of the input so as to be able to investigate exactly how these may impinge upon the course and ultimate attainment of second language (L2) acquisition. This could, for example, take the form of corpus studies of input properties and/or more detailed questionnaire data to probe quantitative and qualitative patterns of exposure to input, both of which have been shown to impact upon adult and child L2 acquisition as well as heritage and bilingual language development (e.g. Montrul, 2008; Unsworth, 2016a).

Indeed, Slabakova et al. (2014: 604) note that ‘linguistic input has emerged as perhaps the key factor in addressing the fundamental question of differences between native and L2 acquisition.’ Assuming this may be the case, the need to take a more robust empirical approach to input is clear if we are to develop a deeper understanding of the nature of input effects, both in terms of POS effects and also in terms of distributional properties of the input available to L2 learners. Adopting a more comprehensive approach to input would have two important consequences. First, and most importantly, it would contribute to a more robust theory of L2 development, broadening the representational focus of the generative perspective and helping to address the perennial ‘transition problem’ (Gregg, 1996). Second, it would make clear that taking a generative approach to SLA does not entail paying no or at best little attention to input.

Our aim here is to open discussion on how to incorporate input effects systematically and satisfactorily with the generative paradigm, and to point to ways in which input could and should be more fully accounted for in contemporary generative approaches to SLA. We proceed as follows: In the next section, we address the question of why generative approaches to language acquisition have been (mis)perceived to disregard input, and we briefly outline some recent findings on input effects in (bilingual) first language

acquisition, which have a rather natural extension to L2 acquisition. Next, we outline some practical obstacles that have perhaps prevented this extension from first language acquisition (L1A) and bilingual L1A (2L1A) research to SLA, and we suggest some practical steps to address these issues. This leads us then to a discussion of how theoretical and methodological advances open the way to a more robust account of input effects in generative SLA. We conclude by returning to the positives for generative SLA that would accrue from closer investigation of input.

II Disregarding input?

As any introductory textbook on generative grammar points out, generativists see the acquisition process as summarized by the equation: $UG + Input \rightarrow Target\ Language$. The underlying premise is that humans are born with some set of innate universal principles (e.g. parameters, morphosyntactic features), and during the course of linguistic development, these principles interact with the primary linguistic data to result in a target language (e.g. Portuguese, German, Hindi, etc.). Decades of research have been devoted to understanding the individual components of this equation: the UG principles, their interaction with input data, and the nature of the resulting target language. Investigating the impact of different input properties permits inferences about the process of language acquisition and the cognitive and linguistic principles that learners are equipped with. For example, learners may be ‘smart’, with a language learning device biased to filter input for designated linguistic triggers or cues (see Pearl & Weinberg, 2007). Alternatively, learners may be ‘naive’, simply comparing frequencies of strings in the input with the range of hypotheses made available by UG to determine the ‘fitness’ of individual grammars to model the input in the environment (see Yang, 2002).

It should already be clear then that the notion that generativists ‘disregard’ input is a misconception. In order to understand why this notion persists, we digress briefly to discuss the POS before returning to the role of input in (bilingual) L1A. The POS has been central to generative theorizing and this is not the place to rehearse the well-known animosity between nativist and non-nativist approaches with respect to input ‘poverty’.¹ Rather, the aim is simply to point out that discussions of POS have involved opponents of the nativist position adopting a form of empirical approach to questions of input which generativists, on the whole, have tended to neglect. This, combined with a focus on what is not in the input, may have fostered the impression that generative approaches to language acquisition consider the input unimportant at best and virtually unnecessary at worst. The approach adopted by those wishing to refute POS effects is to investigate quantitative distributional properties of the input to check whether empirical claims regarding the (un)availability of specific types of evidence hold true. In this regard, Pullum and Scholz (2002: 20, footnote 8) state:

It is most curious that generative linguists call the problem of how infants acquire language ‘the logical problem of language acquisition’ ... Whether sentences with a certain structural characteristic occur in the child’s experience cannot be settled by mere ratiocination. Working on the question demands access and attention to concrete empirical data about utterance events and infants’ perceptions of them

They then go on to study large-scale corpora to test POS claims that certain constructions are so infrequent in the input as to be unavailable as evidence to children learning their native language. Again, these findings and the range of intricate conceptual and empirical issues connected to disagreements bearing on POS arguments are not of primary importance here. Instead, the point is that, traditionally, there has been something of a tendency in the generative enterprise to eschew anything that resembles quantitative corpus linguistics and thus to simply assert that certain input properties are unavailable or rare, as opposed to establishing this empirically. Such an approach may have left the impression that generativists ‘disregard’ the input.

This impression cannot however be taken to mean that generative L1 acquisition research has ever ignored input. Indeed, recent developments have seen precisely the sort of quantification of input properties that opponents might have found lacking in earlier work. To take just one prominent example, Legate and Yang (2007) re-examine the root infinitive stage in children acquiring Spanish, French and English. Using data from child-directed speech in the CHILDES database, they illustrate that frequency effects may explain the cross-linguistic differences in the duration of the root infinite stage as morphological evidence for a [+Tense] grammar is markedly less frequent in English (5.8%) than in French (39.6%) or Spanish (60.2%). This correlates with the reported age at which the root infinitive stage ends in each language: English (>3;5, or 3 years and 5 months), French (~2;8), Spanish (~2;0).

In bilingual acquisition research, the study of input has in fact been a particularly prominent theme in recent work (for review, see Unsworth, 2016a): the input available to bilingual children in each of their languages is in principle less than that of monolingual peers, and the relative proportion of exposure to each of the two languages varies considerably between children, thus making children growing up with two languages the perfect natural experiment to investigate frequency effects on language development. In addition to variation in terms of input quantity, there may also be qualitative differences both within the bilingual population and when comparing bilingual children to those raised in monolingual environments. This quantitative and qualitative variation in input offers a clear – although not necessarily categorical – explanation for the variation observed in L2/2L1 children’s language outcomes (see, for example, amongst others, Hoff et al., 2012; Paradis, 2010).

This greater concentration in neighbouring fields on quantitative and qualitative properties of the input has not yet fed through to generative L2 work. It is of course also not the case that generative SLA has ever completely ignored input (e.g. Carroll, 2001). What we mean here is that a concern with more precise quantitative and qualitative investigation of input properties along the lines briefly sketched above has not yet established itself to the same extent in the field of generative SLA.

Why should we be concerned? First, because given the compelling evidence that input effects exist across a range of language learning situations/populations, and the increasing sophistication of psycholinguistic methods for testing developing processing routines, we consider it unwise to neglect this potentially crucial aspect of the acquisition puzzle. That is, we argue that generative models of L2 acquisition would benefit from quantitative and qualitative studies of input properties to complement theoretical understanding and empirical psycholinguistic findings. Second, a number of 2L1A input studies argue that

the observation of input effects is consistent with usage-based/constructivist/emergentist theories of language acquisition (again, see Hoff et al., 2012; Paradis, 2010). Whilst claiming that a particular result is compatible with a certain theory does not of course directly challenge its compatibility with an alternative (generativist) theory; given the general impression that the generative framework has largely disregarded input, there is a danger that such findings will be seen to align more readily with usage-based approaches simply because they assign a more explicit role to input and investigate specific input properties more closely (for discussion, see Unsworth, 2014, 2016b).

III Investigating input in (generative) SLA research

It is one thing to propose that generative SLA should incorporate more quantitative and qualitative investigation of input, but it is quite another to put this into practice. There are important conceptual and empirical/practical problems that perhaps (have) hinder(ed) the implementation of such a research programme.

First, an equation of the form $UG + Input \rightarrow Target\ language$ is not directly applicable to SLA as (adult) L2 acquisition is by definition different from L1 acquisition in that learners already know another language. A great deal of research has gone into establishing exactly what the L2 initial state is and the nature of the involvement of UG and/or L1 transfer, and this has perhaps eclipsed the role of input.

In addition to this difference compared to L1A research, the L2 situation is more complex with respect to the status and measurement of input. The bulk of input to children can be assumed to come from a limited number of caregivers, making this input more readily quantifiable. Natural parent–child interactions can be recorded and transcribed, and caregivers can be tested in the lab. The CHILDES database (MacWhinney, 1995) provides a standard resource for child-directed speech, meaning that questions regarding the form of the input can be relatively easily addressed and data collection does not need to start from scratch for individual projects. The field of SLA lacks such a standard resource. This is, of course, not surprising given the different L2 input conditions. Adult L2 learners are mobile and are more likely to interact with a larger number of native and non-native speakers of the target language, so pinning down the ‘L2 input’ is more difficult to start with. Even in a classroom setting, where the teacher provides the majority of input, there is still input from classmates and from textbooks and instructional materials. In naturalistic L2 acquisition, learners will likely be exposed to significantly more register (and possibly dialectal) variation than children acquiring their native language.

This list of potential issues connected to investigating L2 input is of course not intended to be exhaustive. It does, however, highlight the challenges that researchers face in conducting detailed analyses of L2 input. How can such challenges be overcome? Limitations of space preclude a detailed procedure to address every possible variable. Thus, we aim simply to give a flavour of how some recent findings and techniques in the literature could be used productively to address such issues, and to outline the relevance of these results to generative SLA.

A good place to start is instructed L2 settings. While these present their own unique challenges, the advantage of looking at foreign language classrooms is that one can assume the bulk of the L2 input learners are exposed to comes from the classroom

(especially if this is foreign language instruction in the learners' L1 environment). Classroom input in the form of instructional materials can be collated into input corpora, which often involves a pedagogical perspective by studying materials used to teach particular grammatical properties (e.g. Anderson, 2007; Tono, 2004). The practical attraction of this approach is that it is relatively technically straightforward to collect textbook corpora. Of course, this particular form of explicit input about grammar is often tangential to answering questions arising from a UG perspective. There are nevertheless practical advantages to being able to establish which linguistic patterns are available in the input, and what sort of explicit information is presented, if only to be able to discount any interference from metalinguistic knowledge in generative L2 studies.

Classroom-talk corpora are potentially more directly relevant for generative SLA research. Working within a usage-based framework, Collins et al. (2009) collected a corpus of classroom talk, thus building a detailed picture of L2 English input as it is available to instructed French-speaking learners whose primary contact with English came via the classroom. They examined the distribution of the possessive pronouns *his/her*, and past and progressive morphology, which have been shown to be acquired at different rates by L1 French–L2 English learners. Methodologically, this is similar to the Legate and Yang (2007) approach: established acquisition findings are re-examined in light of input frequencies. This suggests a possible avenue to pursue further. Generative SLA has produced a host of robust findings. One could, for example, re-examine some of these findings, such as L2 knowledge/production of verb movement in light of corpora of input typically available to particular learner populations in order to make the link between input and UG clearer.

The results obtained by Collins et al. (2009) could in themselves be valuable for current generative models of L2 acquisition, which invoke the transparency of form–meaning mappings to explain L2 developmental patterns. For instance, these authors found that, in classroom talk, rule-governed *-ed* endings occur rarely compared to irregular past; thus, the transparency of the past-tense rule is not robustly attested in this input. In addition, it was found that past-tense marking most frequently occurred on telic verbs, rendering the marking of syntax–semantics mappings opaque. Finally, past tense morphology was not perceptually salient: it rarely occurred as a separate syllable in spoken classroom discourse and it was often masked by co-articulation with a following consonant.

Generative models such as Feature Reassembly (Lardiere, 2009), the Bottleneck Hypothesis (Slabakova, 2008) and Deep Lexical Transfer (Sprouse, 2006) predict that opacity in the morphosyntactic encoding of semantic features reduces the likelihood of reassembling abstract features or relabeling lexical entries in line with the L2 target. General contrastive analyses of L1 vs. L2 may reveal how syntactic–semantic properties are differentially encoded in each functional lexicon, predicting developmental difficulties (Lardiere, 2009). Going beyond this, more specific analysis of how features actually pattern in the input learners are exposed to would provide an empirical enrichment for these models. An input analysis along the lines of Collins et al. (2009) highlights issues of perceptual salience or the opacity of form–meaning mappings that might not be readily apparent from a comparative linguistic analysis. Indeed, with respect to Feature Reassembly, Birdsong (2009) has pointed out that there are interesting questions

concerning how learners can detect feature contrasts in the input, which can really only be answered by investigating the patterning of the relevant features in the learners' environment. He noted that it is conceivable that uninterpretable features are subject to stronger signal reduction than interpretable feature contrasts, and that uninterpretable feature contrasts might be weakened by being less susceptible to information structural prominence (Birdsong, 2009: 240). He stated tellingly that the issue of detectability of contrasts in the input is 'ultimately an empirical question' (Birdsong, 2009: 239).

Beyond providing an empirical enrichment for generative models, theoretical developments may actually require quantification of input patterns. Yang's (2002) Variational Learning (VL) model offers a concrete role for statistical analysis of input within a generative framework and may have potential as a transition theory for L2 acquisition (Slabakova, 2008: 116–18). In the main, however, the model has only been applied to L1 acquisition, where children's linguistic development is characterized as the co-existence of competing grammars, selected from the pool supplied by parameters and UG. These are associated with a certain 'strength' and are either rewarded or punished as a consequence of their success in parsing input data. Thus, the relative proportion of sentences in the input with which the target grammar is uniquely compatible will determine the timing of acquisition, i.e. when much of the input can successfully be analysed by a non-target grammar, the rise of the target grammar will take longer.

As Slabakova (2008) points out in relation to L2 acquisition, resetting from L1 to L2 parameter values is expected to be a gradual process and 'the rise of the target value from probability 0 to 1, and even conceivably fossilizing at 0.8, is going to be correlated with the percentage of sentences in the input that unambiguously reward the target parameter value and punish all others' (p. 117). L1 parameters need to be reset in response to the frequency with which the L2 input unambiguously punishes, or potentially rewards, L1 settings. Adopting this approach would provide a natural way of accounting for the variability of L2 competence and performance. Limitations of space preclude a fuller account of the extension of VL to SLA (see Rankin, 2013, 2014), but the promise offered by the model is surely worth testing and doing so will require quantification of input.

Input effects may not only be assessed in terms of the statistical distribution of certain forms in the input available to learners, they may also entail more general measures of language exposure. Indeed, the bulk of the 2L1 / child L2 literature to date has adopted this angle, showing that the overall (approximate) amount of input to which children are exposed may impact on their rate of acquisition, at least for certain domains and up to certain thresholds (see, for example, Thordardottir, 2014). One approach from this body of research that seems particularly relevant in the current context is Unsworth's (2013) notion of cumulative length of exposure. Traditionally, length of exposure is calculated by subtracting a learner's age of onset from his/her current age. This does not, however, take into account that there is considerable variation in how much input different learners will be exposed to in a given year, nor how this may vary from one year to the next for one and the same learner. By taking this variation into account, cumulative length of exposure is arguably a more accurate way of gauging input effects in bilingual/L2 contexts and comparing different (groups of) learners (for details, see Unsworth, 2013).

Thus far, we have concentrated on quantitative input properties, possibly in combination with re-examination of established L2 findings as a way of starting to

investigate input more systematically. While the statistical distribution of forms in the input may contribute to a more general understanding of the relationship between input quantity and rate of acquisition, other findings from the 2L1 literature suggest that input quality, for example in terms of native/non-native exposure, may also impact on children's rate (and possibly route) of acquisition (at the very least in terms of vocabulary, Place and Hoff, 2011).

It must be acknowledged that the practical hurdles to a more detailed investigation of input effects in SLA are formidable, but the potential pay-off in terms of greater understanding is surely worth at least trying to develop solutions. We have tried to give pointers as to some first steps.

IV Conclusions

We observed at the outset that taking a more empirical approach to input data would have two positive consequences for generative SLA. First, and most importantly, it would contribute to a more complete picture of L2 development. For L1 development, Omaki and Lidz (2015) have recently discussed the role of parser development and how processing research can contribute to addressing familiar linking problems between production and judgments and the internal mental mechanisms that drive development of grammatical knowledge. The core of their proposal is that processing research can show how children assign potentially non-target representations to input, which then act as intake for development of grammatical knowledge. Findings from processing research can thus show that the intake, i.e. the representations incrementally built by the parser, is not necessarily the same as the input, i.e. utterances in the environment directed at speakers. However, being able to exploit this distinction relies on researchers 'access[ing] the content and distributional properties of the input' (Omaki and Lidz, 2015: 159). As we have outlined above, this step is largely missing in generative SLA, even as it is becoming more established in (bilingual) L1 research. More research directly addressing input would complement increasingly sophisticated L2 sentence processing research and would provide a fuller picture of L2 grammatical development.

The second upside of devoting more research to input is sociological. Slabakova et al. (2014: 603) noted that '[t]he importance of input is a point on which generative and usage-based accounts converge'. However, as discussed, this observation is not reflected in the way in which the wider SLA community understands the role of input in generative accounts. This impression is amplified by the fact that non-generative approaches have taken the lead in carrying out quantitative and qualitative investigations of the input. We commend Slabakova et al.'s (2014) aim to defend generative SLA against charges that it disregards input. It is important to clarify the role of input in generative SLA for the wider field; Gass (2003: 229) observes that unlike many approaches to SLA, where input is treated as a 'highly important factor', the UG-approach relegates it 'to a secondary role'. It is true that generative theory has traditionally eschewed large-scale quantitative and qualitative studies of input, and has not standardly included indirect measures of input as explanatory/predictor variables, and this seems to have contributed to a belief in the wider field that generative SLA has nothing of value to say about input. There is a risk that usage-based models of SLA are by default considered the natural

explanatory framework of input effects because they seem more readily to offer explanations of the role of frequency, saliency, etc. However, given the recent theoretical developments in generative SLA referred to above, and increasing interest in language processing, it should be clear that usage-based models have no natural claim on explanations of input effects. Generative SLA offers deep theoretical insight into the process of development of L2 grammatical knowledge and has shown that UG constrains such knowledge given the poverty of the input. The time has come to go beyond poverty and examine more closely whether and how quantitative and qualitative properties of the input might contribute to accounts of L2 development.

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Note

1. See Pullum and Scholz's (2002) criticism of the argument on logical and empirical grounds. Schwartz and Sprouse (2013) provide an elegant defense of the POS position with regard to L2 acquisition.

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