

Formal Linguistics and Language Education: A View from Bilingualism Research

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Abstract

This chapter aims to underline the importance of bilingualism research from a formal linguistic perspective for second language pedagogy. In doing so, we highlight where the two fields of inquiry overlap with each other and offer insights into how language pedagogy can benefit from information gained by psycholinguistic studies on specific properties of grammar and its development.

Keywords: Bilingualism · Language pedagogy · Psycholinguistics

Introduction

In recent years, some scholars who have traditionally worked on the implicit side of bilingual language acquisition have argued that language teaching could benefit from earnest bridges with generative theoretical linguistics, language acquisition, and processing research (e.g., Whong 2011; Long and Rothman 2013; VanPatten and Rothman 2015; Whong et al. 2014; Marsden and Slabakova 2019). Notable exceptions notwithstanding (e.g., White et al. 1991; VanPatten 1996), formal acquisition scholars have rarely endeavored to make such links prior to the last decade. There are likely several reasons for the apparent disconnect, including, but not limited to, differences in the goals and remit of these traditions. Formal linguistics (theory and acquisition) endeavors to describe and explain the psychological reality, development, and ultimate attainment of grammars in the mind, especially abstract hierarchical structure, acquired in a ‘naturalistic’ wild compatible with systematically collected data enabling theoretical justification and prediction. There are various formalisms for understanding grammar in a cognitive science sense that make use of distinct axioms and constructs to understanding language representations in the mind (see, e.g., Goldberg 2019; Jackendoff 2002). By formal linguistics, herein, we refer to generative linguistic theory and its language acquisition corollaries because this is the paradigm under which we work. In general terms, however, the leitmotif message of this paper is applicable regardless of the specific formalism to which one subscribes: language teaching can benefit from linguistic research.

Language pedagogy theory and language teaching in the trenches are charged with a much more practical task and are, rightfully, beholden to a different set of questions and needs. Language teaching theory and practice necessarily engages with the dynamic reality of learning itself in the ‘non-naturalistic’ wild with the task of describing a set of grammar rules that are traditionally based on grammar books and/or the teacher’s personal knowledge/competence in the target language (but see, e.g., Rankin & Whong; Döring; and Elsner in this volume). Not surprisingly, then, audiences and stakeholders that are interested in and/or targeted by language pedagogy research and formal linguistic research are only partially overlapping. We see, however, that the overlapping audience is, at present, smaller than it should be. We will discuss our thoughts on the matter as well as research that supports the aforementioned view that insights from linguistic research can be useful for more effective language teaching in the remainder of this chapter. It is fitting that this piece should

accompany the present edited collection of papers that, as a whole and individually, provides credence to the general idea that formal linguistics and language teaching are ripe for better communication and cross-fertilization for the mutual benefit of each.

Why Not Before, Why Now?

Despite having language as their main object of study, formal linguistics and language pedagogy deal with different sets of constraints from their own real- world contexts, individually defined by distinctions in their approaches. In the case of language pedagogy, creating and understanding purposefully designed interventions, teacher training, understanding the learner needs and domain-general constraints on learning serves a dual purpose. The remit is to both understand how language learning unfolds in a classroom context in a general sense, but also to gain knowledge to maximize resources at various levels: what is reasonable to expect in the context of classroom learning and how to best attain learning goals towards a measurable target juxtaposed against procedural, financial, temporal, motivational and many other constraints (see Döring; Elsner in this volume). In this context, descriptions of the characteristics of a language system as described by formal theorists are only useful to language teachers to the extent that this set of information is transferrable to learners as a collection of grammar rules (see Rankin & Whong in this volume). Of course, generative approaches to bilingualism engages with acquisition in non-naturalistic classroom environments as well. However, its focus is not on intervention or facilitation of learning in any sense. In fact, it is not seemingly interested in learning at all, a point to which we return in greater detail below. Instead, its remit is exclusively on the implicitly acquired system itself, its formal representations and how acquisition/processing of non-native language obtains.

Generative approaches largely subscribe to a crucial distinction between acquisition and learning. The former relates to the passive act of forming linguistic representations on the basis of input/intake in conjunction with whatever domain- general and domain-specific mechanisms one has at her disposal. Alternatively, learning refers to the (typically conscious) act of obtaining a skill set from explicit effort and overt, purposeful teaching. While there might be specific talents for non- native language learning in the form of language aptitude (see Wen et al. 2017 for review) and differences in language attitudes/motivation (see Dörnyei 1998, 2003; Dörnyei et al. 2016 for review), the general idea is that language learning in a classroom setting, as opposed to acquiring a language in a naturalistic environment, is not so different from the learning of other skill sets (DeKeyser 2007a, b, 2018). Theoretical paradigms differ considerably with respect to what cognitive/linguistic mechanisms they accept as contributors to the acquisition process (see Synder 2007; O’Grady 2005; Clark 2009; Ambridge and Lieven 2011; Guasti 2017). However, they all conclude that language acquisition in children is a virtually completely involuntary, unconscious activity. While the same paradigmatic splits exist for bilingualism and although there are active discussions even within a single paradigm regarding potential mechanistic differences between children and adult language learners, researchers focusing on adult bilingual language acquisition tend to agree that much of what adult bilinguals come to know is acquired implicitly (see VanPatten et al. 2020). Although passive acquisition can and does happen in parallel to learning in a second language classroom setting at all ages, the context of explicit instruction as the primary source of input in classroom language learners is quite distinct from the task of native language acquisition. Similarly, compared to the task of second language teaching and learning, native language teaching and its grammar instruction

at school (e.g., German language classes for native speakers of German, English for native speakers of English) has its own constraints (see Turgay and Gutzmann; Döring; Elsner in this volume).

Since language acquisition and processing theories are largely concerned with acquisition and language pedagogy with learning, this alone might explain the dearth of connections between the two fields. Within generative acquisition, it was (is) largely held true that there is no interface between explicitly learned and implicitly acquired knowledge. And so, rules that are explicitly learned would not (could not) become part of the underlying acquired grammar, but would remain as conscious metalinguistic knowledge, constituting a competitive system of its own (see Felix 1985; Rothman 2008; Long and Rothman 2013 for discussion). To the extent that explicit knowledge of rules—grammar rules taught in a classroom—coincides with an acquired/implicit mental representation of the same rules, it is difficult to tease the two apart (where they do not overlap is precisely where you can test and appreciate the distinction). Nevertheless, their qualitative natures are distinct. This distinction (implicit vs explicit knowledge) is reminiscent of Ullman's (2001, 2016) distinction between declarative and procedural memory in language acquisition and the related question many have asked whether or not some linguistic structure that has been acquired via the declarative system can become procedural. Ullman has never denied that declarative knowledge can be automatized over time, making it more difficult to distinguish at the surface level between what is acquired via the procedural system and what is automatized via declarative knowledge. Automatized knowledge acquired through the declarative system cannot suddenly be considered procedural knowledge because it remains qualitatively different by virtue of the memory system through which it was originally acquired. If indeed there is no interface between acquisition and learning, then it stands to reason that theorists and practitioners alike would be less inclined to dialogue, much less see one another's research as particularly relevant and useful. In 2019, however, this no interface position in generative approaches to non-native acquisition is not as steadfast as it was in prior decades, at least for some scholars. It might be the case that explicit instruction can have effects in mental representations. This can tell us many things about formal theory itself.

In line with the above, some current generative L2 proposals that highlight and account for the difficulty adult learners have with inflectional (functional) morphology are particularly relevant. The Bottleneck Hypothesis (Slabakova 2008) and the Feature Reassembly Hypothesis (Lardiere 2009) each claim that morphology is particularly challenging, in fact, the very 'bottleneck' of acquisition for adult learners. The Feature Reassembly Hypothesis essentially claims that adults can acquire new L2 features without major problems. The challenge is the re-distribution of L1 features, particularly, how they bundle together, onto new morphological exponents. The Bottleneck Hypothesis further claims that structured input or, potentially even explicit knowledge, related to how features bundle together on target language morphological units could help learners to generate the parsing failures required to promote better, more efficient reassembling of features. The next step is to translate these linguistic formalisms and predictions for different L2 learner contexts, with their L1s in mind, into targeting the learning challenges by designing interventions that lead the learner's mind to establish form-meaning mappings that assign newly acquired L2 features, and crucially, reassign the L1 features appropriately to relevant L2 morphology. This all points in the direction that structured input, as argued for decades in the Input Processing literature (see above) is a key factor for improving learning outcomes in the typical L2 classroom. Although some erroneously believe that generative linguistics devalues the role of input in the acquisition process, recent proposals highlight just how

incorrect this is. Input is the core building unit of specific grammars (e.g., Yang 2016), especially in light of the concession that parametric settings themselves would not be part of the genetic endowment of Universal Grammar (Rothman and Chomsky 2018).

It seems almost certain that imparting what decades of research on how non-native grammars are acquired and represented, often unintuitively so, coupled with infusing linguistic descriptions to the baseline target grammars used in language teaching has the potential to improve the quality of language teaching. If the cognitive and linguistic study of language acquisition reveals seemingly hardwired constraints or adaptive, dynamic ones to acquisition, it only stands to reason that pedagogical approaches working with and not, inadvertently, against such constraints will be more successful for more individuals. If a pedagogical grammar unwittingly overgeneralizes or underestimates some properties of language described, either knowingly for ease of teaching or simply because it is not as linguistically informed as it could be, there is a risk that such does more harm than good in the long run. Minimally, inaccurately learned knowledge will need to be unlearned down the road, fostering a context for pedagogically induced, lingering variation, as described by the Competing Systems Hypothesis (Rothman 2008) in the existing literature, as well as in Snape's and Rankin & Whong's chapters in the present volume, which look at learnability issues in second language acquisition, in Agebjörn's contribution that focuses on the use of explicit knowledge in developing implicit knowledge of certain grammatical structures, and in Stadt, Hulk and Sleeman's article that investigates the role previously learnt languages play in third language acquisition.

Indeed, language teaching necessarily makes explicit that which is inherently implicit under child language acquisition scenarios. Language teaching must try to be better informed about language acquisition in the "wild" because it is itself a gap filler. Its utility is predicated on the fact that creating the same or comparable conditions to native, naturalistic language acquisition is virtually impossible on several planes. It makes sense that accuracy in linguistic description is paramount at the outset of curriculum materials and teaching methods development as well as teacher training. While we acknowledge that linguistic descriptions of grammatical structures as they are observed in the naturalistic "wild" and in the mental representation do not necessarily overlap with the grammar "rules" that are described and presented in language teaching materials, the existence of this mismatch underscores a missed opportunity where educational linguists should be working with formal linguists. In principle, theoretical linguists hold some useful keys for more efficient curriculum design; however, they lack the expertise to implement them, expertise which language pedagogy theorists have. Working together to translate such knowledge to two sets of audiences, teachers and students, in an appropriate way for them, the language teaching scholar, the formal acquisitionist, and the formal theorist can accomplish an important task together.

Of course, work focusing on high-quality language teaching with the aim of building some bridges exists, especially by scholars such as Patsy Lightbown, Nina Spada, Sue Gass, Pilar Garcia Mayo and Bill VanPatten, to name a few. Although their work is linguistically informed and, thus, has a trickle-down effect towards what we are advocating, they have generally not attempted to explicitly link formal linguistics to teaching practice in the way we are discussing herein. A notable exception worthy of discussion is VanPatten's Input Processing Theory and its corollary Processing Instruction approach to teaching that, in principle, incorporates insights from the former (VanPatten 1996, 2002a, b). Input Processing Theory highlights the fact that, irrespective of intension and often unintuitively, non-native adult bilinguals process linguistic input via a series of hardwired constraints. Depending on

the target language, these default processing strategies are, a priori, more or less helpful. For example, one such constraint has been labeled the First Noun Principle which captures the default tendency for adult learners to process the first noun in a sentence as the subject, potentially irrespective of whether that is what is done in their native L1 or not. If one is learning English, this is a pretty good strategy given that English does not drop subjects like many languages and has a pretty robust, S(ubject), V(erb), O(bject) word order. However, if one is learning a language where subjects are often dropped, like Spanish, this is a less optimal strategy. Given that subjects are often dropped, the first noun encountered in Spanish is likely to be the object of the verb and not its subject. In parallel to Input Processing Theory and the underlying empirical research revealing the processing principles, VanPatten developed Processing Instruction, which asks and answers the key question “what do we do with insights from formal acquisition/processing theory?”. Details aside, Processing Instruction provides a rubric of intervention by which, via modified input and specifically designed tasks, the parser can be tricked into failures much sooner than would otherwise happen. The theory uncovers the bottlenecks in the acquisition process and the pedagogical intervention on the coattails of formal research that provides a way around them. VanPatten’s theories have spawned literally hundreds of studies. Although, unfortunately, some do not represent faithfully his original intention or are faithful to the bridging of theory to practice, those that do exemplify the possibility and the benefit of increasingly formally inspired pedagogical interventions.

It is important to make it clear that we do not think that this is a direct link between teaching X and its potential outcome Y, but we do see how the outcome Y can be facilitated indirectly by insights from formal linguistic and processing research. Explicit grammar instruction, increasingly accurate descriptions of grammar and/or task development that works with our natural predispositions for language processing could help the learner get more input and make better use of what is available in the input so that the internal mechanisms get higher quantities and better qualities of proverbial gasoline to most efficiently perform the tasks of acquiring a new language system. Therefore, while we do not believe that conscious knowledge of morphological paradigms or drilling them is necessary or sufficient for language acquisition, such knowledge, especially in a classroom context, might facilitate processing and maximize the allocation of limited resources, optimizing opportunities for acquisition in the true sense of the word to take place. These are, of course, empirical questions that are being tested. Because of the promising results (see, e.g., Dudley and Slabakova, this volume) and the renewed enthusiasm within generative approaches to bilingual acquisition to make itself more meaningful to language teaching where possible, the timeliness of the present volume is a huge step in the right direction.

Final Words

Before enduring and truly meaningful bridges can be formed, however, it is fair, if not prudent, to ask if bilingual language teaching can really benefit from formal linguistic theories and research. If so, then after revealing and defending why we must take steps to show how there is benefit, ideally mutual benefit, from building such bridges. We take it as a given that there should be an inherent connection between the scientific study of language—linguistics and psycholinguistics proper, irrespective of specific formalism—and pedagogical practice in the domain of teaching. While we strongly believe that language teaching should be informed by what we know regarding the mental constitution of language as well as constraints on how language is (likely) to be acquired, processed, stored and accessed in the mind/brain, bridges built are destined to be untraveled if we do not project beyond the

obvious connections and benefits by making practical and usable insights. What we have provided herein is merely a taster of what has been done and what can be done. Recent venues such as the Educational Linguistics book series by Springer in which this volume will appear as well as the newly launched journal Pedagogical Linguistics published by John Benjamins are excellent venues attempting to fill the gap of much needed venues for achieving the goal of interdisciplinary work between formal linguistics and language pedagogy. The next years will prove the extent to which we can, and indeed desire, to take these insights and others various scholars have been discussing for some time now to the next levels.

Information from formal linguistics and acquisition is necessary, but, we submit, not sufficient to accomplish the goals at hand. Knowing that, in principle, there can and should be more linguistically-informed pedagogical interventions designed to circumvent the pitfalls for adult language learners that are consistently observed and for which, at present (and any given time in the future), linguistic theory can provide some insights into is also not sufficient. Partnerships with pedagogical theorist to carve out practical ways to implement these insights is necessary. Combining the expertise on the ground that pedagogical theorist and educational linguistics have with the expertise of acquisitionist and other cognitive scientists can yield meaningful and enduring improvements to outcomes.

As a final aside, it might be useful to consider some other related research on neurocognition as well as multilingualism in general. More than half of the world's population is bilingual (Bialystok et al. 2012), with 54% of Europeans reported to be at least bilingual (19% bilingual, 25% trilingual and 10% four or more languages (Eurobarometer 2012) and 21.3% of the US population being bilingual (American Community Survey 2017). This means that an increasing number of children around the world grow up as bi/multilingual and enter the school system with linguistic knowledge/competences varying from one of their languages to the other(s). Work on additive multilingual acquisition and processing is very clear: all previous linguistic knowledge matters (see Rothman et al. 2019, for review). Successive L3 and L2 acquisition/processing is not the same (see Stadt, Hulk & Sleeman, in this volume). What does this mean for the theory and practice of language teaching, which is traditionally fed by methods of teaching English as a second/foreign language to groups of (predominantly) monolingual speakers? Should this linguistically more diverse and cognitively more resourceful learner profile in the classroom play any role in the way teaching practitioners, policymakers, materials/curriculum developers and educationalists make decisions? How will future bridges to offer more linguistically-informed pedagogy deal with this reality? Bilingualism affects the mind/brain (Bialystok 2016; Bialystok et al. 2012) with the most contemporary evidence suggesting that anatomical and cognitive adaptations in the bilingual brain are ameliorated by language experiences such as domains and frequency of use (DeLuca et al. 2019). What is the relevance of this literature for language teaching and how will this literature (or should it) also contribute bridges to language pedagogical theory?

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