

Response to *The Taipei Lectures*.
In (2003) *Explorations in Language
Acquisition and Use: The Taipei Lectures*.
Portsmouth: Heinemann, by Stephen
Krashen.

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and Literacy Learning: East Asian and
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City University of Hong Kong Press, by
Norbert Francis.

Chapter 9

Research problems
that still have not been solved —
Response to The Taipei lectures

We can now step back and review how the basic research on bilingualism, second language learning and literacy (Chapters 2–4) might help language educators reflect on practical issues in teaching (topic of Chapters 5–7). Concluding chapters like this one sometimes show how the different themes of a discussion are related if they contrast approaches that have led to different conclusions. This is what I will attempt to do, outlining at the same time what seem to be important avenues for future research.

The selection of basic research started with asymmetrical bilingualism in Chapter 2 not only because it is more common than balanced bilingualism, but because asymmetry seems to be an especially useful key for revealing essential properties. The proposal for moving forward in a research program of this kind quickly gravitated in Chapter 3 toward a framework of mental architecture that emphasizes components and modules and how they are interconnected. The discussion of the different ways that this kind of modularity hypothesis might be understood in relation to the development of language abilities set the stage for questioning whole language-oriented and other holistic/integrativist models of literacy (in Chapter 4). It would seem, by most accounts, that holistic theories of literacy teaching and theories that accept modularity stand in clear opposition one to the other. According to the conventional sense of the terms holistic and modular, this seems reasonable; and in fact, it is a useful way of understanding current debates about language and language learning. Interestingly, whole-language orientations in literacy also tend to carry over to second language pedagogy — e.g., teaching applications based on the input hypothesis. The well-known proposals of Steven Krashen in both of these areas, as we have seen, are in fact consistent in this regard. The opposition between these theories then should make future head-to-head research comparisons easier to design; the opposing claims should be easier to formulate and evaluate.

What is more interesting, perhaps from a purely theoretical point of view, is the observation, not widely commented upon, nor called attention to by Krashen himself, that his input hypothesis for SLA shares a view of language ability with modularity theories. The proposed distinction between *acquisition* (associated with implicit knowledge) and *learning* (explicit) is the most illustrative example. If this observation is correct, then research comparisons may not be as clear-cut as was just suggested. The related idea of how acquisition proceeds developmentally in child first language (without awareness, deliberate attention, much less direct instruction) is also a view shared with Universal Grammar (closely associated, in turn, with the modularity perspective). Thus, our proposed “clear opposition” has become a little more complicated, at least considering the view of the most prominent defender of whole-language and the natural approach to SLA. This complication, actually, is not a bad thing because debates in science are not, or should not be, about which “side” is right (about everything) and which is all wrong.

In a series of papers, published together under the title of *Explorations in language acquisition and use: The Taipei lectures*, Krashen (2003) summarizes what we could call a natural approach theory of second language acquisition. In the review of the research on instructed SLA, he takes a strong position critical of all studies that have investigated the effects of direct instruction of language objectives. Recall that the overarching theme of Chapters 5, 6 and 7 was an examination of some key features of instructed SLA. Krashen

goes so far as to imply that further research on the direct teaching of language objectives is no longer of any scientific or practical value. Indeed, he finds fault in every study of form-focused instruction cited in the *Lectures*. In turn, some of his critics take a similarly categorical stance, failing to evaluate his input hypothesis in a balanced way. Sometimes the attempt is made to discredit all of its claims. In this concluding chapter, I will avoid this error. In fact, it should be recognized that most important research questions in language acquisition and literacy learning, for both L1 and L2, remain open. This is the main reason why the discussion between proponents of the input hypothesis and instructed SLA shouldn't be as polarized as it has become. All sides on the different controversies should also step back to reflect on future directions for research based on what we know so far — and what we still don't fully understand. First, let's recapitulate the discussion of Chapters 2, 3 and 4 on basic research problems of bilingualism and literacy, and then address what appears to be the controversy about the examples of instructed SLA discussed in Chapters 5, 6 and 7.

9.1 A window into the inner workings of the bilingual mind

In his survey of the neuroscience of reading, Dehaene (2009) concluded that the “standard social science model” of learning based on a cognitive structure unhindered by specific biological constraints, infinitely adaptable, and internally homogeneous is seriously flawed. Chapters 2 and 3 on the imbalances of bilingualism and Chapter 4 on reading in Chinese came to the same conclusion. To be sure, “conclusion” here means that the idea is plausible and worthy of further study.

Recall that we looked at two kinds of imbalanced bilingualism — the typical kind and the atypical (exceptional, often associated with trauma or disability). While both kinds suggest a componential organization of language ability, the latter, exceptional bilingualism, brought forward the strongest evidence for modularity. That in addition to domain-general knowledge structures and processing mechanisms, it is hard to deny the existence of domain-specific components. When imbalances are extreme and circumscribed (highly exceptional and specific) the recurring patterns of ability and stark disability suggest that broad mental faculties (much less the mind as a whole) are not completely homogeneous.

On the other hand, the typical imbalance of Chapter 2, while it is also consistent with a modular organization of language, doesn't reveal the components as sharply, with dissociations that are as starkly contrasting. But in the differentiation between primary language (mother tongue/L1) and second languages, “secondary” in interesting ways, we have the fundamental research problem that will eventually help settle the debate between natural approach/whole-language theories and instructed SLA theories. The differences between L1 and L2 are widely recognized; in exactly how they are different is a problem that we still have to work on, along with explaining why. For now, if we recall the review

of research on the L1-L2 difference, this will set the stage for better understanding the acquisition-learning distinction.

In early childhood language development, the emergence of the mother tongue/L1 relies heavily on acquisition processes that are spontaneous and implicit, not subject to awareness, independent of any kind of deliberate teaching, and not dependent on practice or negative evidence. Simple-immersion/comprehensible input is sufficient for assuring the construction of the basic core grammar. These are the language *acquisition* processes. Simplifying greatly, such is the view of language development consistent with UG theories. Importantly, to say that the child “relies heavily on” these acquisition processes does not mean that domain-general explicit *learning* plays no role in mother tongue/L1 development.

Chapter 2 proposed (for further investigation) that a shift occurs in the development of second languages. Acquisition processes are not lost to the L2 learner because the specialized Language Acquisition Device is not degraded or eroded. That’s why adults, for example, can still benefit from simple-immersion in a L2. However, *access* to these language acquisition resources, now for the L2, is not the same as it was for L1 (review the explanation for this shift in Sections 2.4 – 2.6 of Chapter 2). To compensate for this inhibition of access, cognitive-general learning mechanisms, metalinguistic awareness, deliberate attention, and focused practice with feedback (resources all now more well developed in the older learner) can help to boost learning effectiveness and ultimate attainment. Note to the reader — UG-oriented researchers of L2 are not all of one mind on this proposal. In any case, one of the enduring puzzles of end-state second language competence (of the basic core grammar of the L2) that future research will have to take up is the kind of wide variation among second language speakers — not seen in unattired L1:

1. among those who have received massive amounts of simple-immersion/comprehensible input — only,
2. among those who have received many years of intensive form-focused instruction – predominantly, and
3. among those who have taken advantage of both simple-immersion and FFI.

All of this led in Chapter 4 to a focus not on acquiring/learning the basic grammar of a first or second language, but on literacy. The research problem of modularity was carried over from Chapter 3, as it came to be applied to a specific ability — reading. The implication here is that the concept of modularity might apply broadly across the many domains of cognition. Not surprisingly, the idea of components and modules in reading contrasts sharply with whole-language philosophy. However, as the reader will recall, the central issues at hand in the research on reading in Chinese are far from being resolved. The decisive work on how morphosyllabic writing is mastered by children and how it is processed by experienced readers is just now turning the corner. So for that reason the role of phonology in reading characters and the modular-holistic debate, as it applies to Chinese writing overall, was left on hold. But the way the discussion was framed, I think, is worth considering as a guide for designing future experiments.

Chapters 5, 6 and 7 continued the discussion of second language acquisition/learning and literacy by focusing in on some specific problems of instruction. These research problems are both widely commented upon by educators and controversial — the role of correction and self-correction, the importance of the more general ability to systematically reflect on language patterns (metalinguistic awareness), and the efficacy of direct instruction in L2 immersion. Before proceeding, two clarifications about the discussion in these chapters is necessary to make — (1) the research questions examined in each case are still unresolved; and it would be wrong to suggest that the studies cited in this book have proven that instructed SLA models, which tend to strongly favor direct instruction, promotion of metalinguistic awareness and provision of corrective feedback, are superior to all others. (2) Nevertheless, the growing research base forming around these research problems also strongly suggests that this work is not in vain and ill-considered, far from it, it seems, by all indications. As has been argued already in this chapter, the way forward in the field of language and literacy learning requires a objective assessment of the advances we have made to date and of the conceptual and theoretical challenges that remain ahead.

9.2 Ten points of agreement

With this goal in mind, a good way to begin to frame a balanced assessment of Krashen's proposals is to establish where there is a shared common ground. Especially in science (as opposed to political debate, for example), the best way to proceed in a discussion of differences is to first establish clearly on which points there might be agreement, on which points does empirical evidence converge. Readers will notice that the following conclusions and recommendations taken from the *Taipei lectures* are not incompatible with the research that has been reviewed in the previous eight chapters. The common ground is substantial, this being usually a good starting point for any discussion; sometimes it is, even, in politics.

1. Comprehensible input is necessary for language acquisition (for L2 and for L1 even though the actual acquisition processes and external conditions are not the same in every way). In fact, L2 learners require massive amounts of meaningful experience in the target language in a wide variety of presentations, preferably both oral and written. Second language immersion is the most effective and efficient teaching model that can provide this necessary experience. Content-based language instruction is a kind of immersion that lends itself ideally to L2 learning, especially for school-age learners. Input (the language) that is comprehensible and is about new concepts that are motivating (the content) is the platform from which second language acquisition advances most effectively.
2. By means of rich comprehensible input alone, what we called simple-immersion in Chapter 7 (i.e., no deliberate grammar teaching or form-focused instruction), learners can make progress in their L2 competence. Extensive comprehensible

input improves both fluency and accuracy; that is, the student acquires grammatical competence, which contributes to improved ability. This most self-evident observation of second language acquisition/learning, in children and adults across all cultures, cannot reasonably be denied.

3. The proposed distinction between acquisition and learning appears to be a fundamental concept that potentially helps explain a number of difficult problems in first and second language development. Research from different sub-fields in language learning suggests that the distinction is psychologically real in an important way. If we define acquisition as development of implicit competence, typically without awareness or direct teaching, then the contrast with deliberate learning, which leads to explicit knowledge, is one that has been widely accepted in the field of language development. In the discussion of the relative importance of implicit and explicit knowledge in SLA, sometimes the possibility of developing competence without awareness is questioned (DeKeyser, 2005b). The idea is that this possibility in L2 requires more research. But the claim that denies incidental acquisition without awareness is too strong. In L1 acquisition prior to age 5, and conceivably after as well, it is widely accepted, and is largely uncontroversial, even among researchers outside of the Universal Grammar tradition. In L2, if this kind of imperceptible acquisition is categorically rejected, then the conclusion must be drawn that L2 development is fundamentally discontinuous with L1 in every way, shares none of the same acquisition processes, and that for L2 learners UG-guided acquisition mechanisms have completely eroded. Under this assumption, it would be very difficult to account for intermediate or advanced L2 mastery by the many unschooled and illiterate learners who remain bilingual — especially where this L2 has not become a Replacing Language, recall from Chapter 2.
4. The monitoring of grammatical form for correctness and accuracy is more effectively or more easily implemented in certain language performance situations than others. For example, this is clearly the case in self-correction and revision of written expression in contrast to the monitoring of speech. Some forms of corrective feedback are either not practical or may actually be counterproductive (see Chapters 5 and 6).
5. Additional context support in language teaching along with modifications of speech and written text material, what was called LLSD in Chapter 7 (also known as ESL-talk or caretaker-speech), are particularly useful for L2 beginners. From this follows an important pedagogical principle — unsystematic integration of beginner second language learners with native-speakers usually does not provide them with comprehensible input, resulting rather in what is called “submersion.” In addition, what are sometimes called “authentic texts” become more readable, and comprehensible, as L2 learners’ ability *improves*; and importantly, unmodified texts written for literate native-speakers of the target language do not provide comprehensible input for students who are just starting off. Baker *et al.* (2007) discuss the usefulness of so-called “graded readers” for beginners to jump-start

self-teaching through extensive reading and other kinds of L2 immersion. Along the same lines, L2-medium subject matter classes for L2 beginners involving new, context-reduced, cognitively demanding and higher-order academic material should be “sheltered.” Opportunities for integrating L2 learners and native-speakers should of course be sought out wherever this is feasible, but not at the expense of making input for L2 learning incomprehensible.

6. There may be a progression of acquisition to which L2 learning is subject, a kind of “natural order” that constrains progress in mastering the second language grammar. For each language certain constructions may tend to be “early-acquired,” others “late-acquired.” What on the surface appears “difficult” and “less difficult” is often deceiving. And there may even be a set of more abstract universal constraints on acquisition; and these conditions and possible developmental stages may not be the same for L1 and L2 (on this last point, Krashen may not agree). However, about this we still know very little.
7. The starting point for organizing syllabi for second language classes should not be based on the chapters of a traditional grammar manual. Rather, the teaching program should be content-based, predominantly focused on meaning. If classroom discourse is communicative, this condition favors learning and acquisition. The acronym CLT (Communicative Language Teaching) should be embraced by all sides in the debate on the proper role of direct instruction.
8. Teaching language by presenting learners with rules to memorize followed by rote drill of examples and translation exercises is not the most effective method for either learning or acquisition. Today, virtually all practitioners and researchers look back to these methods as antiquated, of purely historical interest.
9. Thinking about the development of academic language proficiency in the second language is a good starting point for organizing a plan of instruction, especially for school-age students and all learners who study a L2 for academic purposes. It requires different methods from those that only promote conversational discourse ability.
10. Design flaws and inherent methodological difficulties that most research in SLA suffers from prevent us at this stage of the evolution of the field from drawing definitive conclusions. Especially in comparative studies much work remains to be done in controlling relevant factors.

9.3 Five questions that remain open

The overall tenor of the *Lectures* is strikingly categorical; and on some points the

conclusions seem unmeasured. Sometimes extreme proposals, what in science are called “very strong hypotheses,” turn out to point investigation in the right direction. But in the field of second language acquisition, until a broader research base and consistent evidence preponderantly in one direction have been established, it is better to not discard with such absolute assurance alternative hypotheses. The book begins and ends with a series of apparent certainties that might lead the reader to think that the major research problems in SLA have already been resolved:

- The natural order of acquisition of grammatical structures is “*immune* to deliberate teaching,” and that “conscious learning has only *one* function: As a “Monitor” or editor... that conscious learning has only this function” (p. 2).
- If the input/comprehension hypothesis is correct, and students can be provided with enough comprehensible input, “it means the *end* of grammatically based language teaching” (p. 5); and
- Research on the effectiveness of grammar-focused instruction is *futile* (p. 84) [Except for the original “*only*,” emphasis added to “*immune*,” “*one*,” “*end*,” and “*futile*.”].

To the contrary, far from being irremediably hopeless and fruitless, advances over the past two decades in the field of SLA on how to integrate grammar learning into second language teaching have resulted in a number of well thought out proposals that cannot be dismissed out of hand.

9.3.1 Similarities and differences between L1 and L2 development

In discussions of the input hypothesis, proponents of natural approach methods rarely make reference to how development in each case is similar and how it is different. The overall assumption appears to be that L2 can, or should, develop “naturally” in the same way that children acquire their L1/mother tongue. In the case of L1, “natural” is indeed an accurate way of describing how the core grammar unfolds effortlessly and involuntarily. In young children, acquisition is spontaneous and inevitable given exposure to normal language socialization and comprehensible input (Barry, 2008; Bernal *et al.*, 2010; Christophe, 2002; Lidz, 2010; Tager-Flusberg & Zukowski, 2009; Yang, 2006). Native speaker attainment in the L1/MT is complete without recourse to instruction, literacy, corrective feedback or metalinguistic abilities.

Second language acquisition, according to the input hypothesis, should proceed along the same lines. “We acquire language in only one way — when we understand messages... language acquisition is effortless. It involves no energy, no work. All an acquirer has to do is understand messages...language acquisition is involuntary...The acquirer has no choice (Krashen 2003: 4). However, as we saw in chapters 2 and 6, there is growing evidence that both acquisition and learning in L2 do not follow the same course as in L1. And in contrast

to universal native-speaker completeness, given an equivalent level of exposure to a second language, ultimate attainment varies widely (Montrul, 2008). This is the most striking and strongly consistent observation regarding the L1–L2 difference: how L1 acquisition is in fact involuntary and that completeness is inevitable; and that in L2 it is neither.

Among researchers, accounts and explanations for the L1–L2 difference also vary. For example, one hypothesis is that critical period effects not only apply to the L1, but also to L2, albeit in a different way (Long, 2005); alternatively, the difference in mastery might be related to the circumstances of development of first language versus second language, rather than maturation or age of onset. Readers will recall from Chapters 2 and 8 that the latter hypothesis is the one favored by this author. An important ancillary issue is whether the LAD is potentially fully accessible or has undergone one or another kind of deterioration and is defective in some way after a complete L1 linguistic subsystem is attained. The former position (that UG-guided acquisition mechanisms are still intact) divides into two hypotheses — (1) UG and LAD are accessible as freely and as unfettered as they were in L1 development, (2) to a greater or lesser degree the case-hardened grammatical structures of the unattired L1 linguistic subsystem filter or block access to UG and LAD such that access is no longer universally unrestricted. Cutler (2001) and Doughty's (2003) L1 interference effect model (“developmental sharpening” in the native language constrains/alters non-native processing) explains the fundamental difference between L1 and L2 development. Recall that this is basically the same account proposed in Chapter 2, sequel to Francis (2012, Chapter 6). Hypothesis (1), unrestricted UG/LAD access, L1=L2, would be compatible with Krashen's natural approach to L2 teaching.

Does the hypothesized L1–L2 difference also apply to child L2 learners, or is there a late age cut-off (e.g., around puberty)? As was clear in our discussion of these issues in previous chapters, after many years of work on the various related problems a consensus appears to have been reached on an early critical period for L1. But for L2, we are only beginning to appreciate how complex the relevant questions are; and it is still premature to commit ourselves to one account or another. If anything, the “no-difference” hypothesis (L1 acquisition = L2 acquisition) would seem to be the least plausible, and faces the most difficult burden in trying to explain away the accumulated research findings on L2 variability. Can all non-native attainment in the L2, by all accounts the typical outcome when the bilingual's L1 maintains its primary language status, be attributed to external circumstances (e.g., inadequate comprehensible input), even after decades of immersion in a L2 environment?

For example, the “affective filter” condition is not a sufficient explanation for non-native L2 ability or failure on the part of the L2 learner to make progress. It is claimed sometimes that affective variables (anxiety, low self-esteem, lack of social integration) block the processing of input by the LAD, even if it is comprehensible. While these kinds of social context factor probably affect acquisition and learning (e.g., via diminished motivation) the way they affect second language presents us with a puzzle. First of all, the “affective filter” does not impede access to the LAD or negatively affect development of the core grammar in *first language* development. For example, children who speak minority languages as their primary L1 that are the object of persistent and widespread

discrimination do not suffer from attenuated or incomplete language development. In many situations where a socially dominant national language is spoken in the speech community, and is taught in school, the minority language may undergo attrition or displacement. But in monolingual development or where the L1 mother tongue is clearly primary and the national L2 is clearly the weaker language, grammatical development maintains its normal and typical course. Special examples include sign language acquisition by deaf children and indigenous language maintenance in adverse conditions of learning and use. In this way, the problem of accounting for affective and motivational factors highlights a more complicated situation — Why in bilingual development do some factors rise to prominence, factors that play no role in monolingual or L1 development? This was the topic of Chapter 2.

9.3.2 Components of language ability and how they might interact

Interestingly, Krashen's claim that learned explicit knowledge of language does not contribute to building implicit competence (in the literature, termed the "no-interface position") appears to assume a strong version of the modularity hypotheses associated with some UG theories of language acquisition. In this sense, we could take it as a strong hypothesis for its view of (implicit) linguistic competence as highly encapsulated. Encapsulation in this instance implies that the specialized modules of grammar, strictly and narrowly constrained by the domain-specific knowledge components of UG, are sealed off from cognitive-general learning. Even though neither UG nor modularity are concepts that Krashen makes reference to, the strong differentiation/separation between implicit and explicit knowledge, and acquisition and learning, suggests an affinity with the above-mentioned strong-hypothesis arguments, allowing us here to take the liberty of interpreting the no-interface position from the perspective of this model, for argument's sake. This approach to understanding the broader controversy is in line with the idea of establishing the broadest possible common ground.

Acquisition is guided by the LAD (acquisition mechanisms that are spontaneous and do not require awareness); learning, on the other hand, is deliberate and does imply awareness. The former results in implicit knowledge of grammar, the latter, explicit knowledge — two independent acquisition/learning mechanisms and two independent domains of knowledge. To begin, let us assume that the distinction between implicit (automatic/sub-conscious) and explicit (metalinguistic) knowledge is correct. In our review of Paradis (2004) in the previous chapter we saw that this theory of two separate networks and kinds of language knowledge is entirely plausible. A modular differentiation along these lines was taken to be correct in Chapter 3 in the discussion of exceptional bilingualism and in Chapter 4 in regard to the distinction between phonological competence, *per se*, and meta-level awareness of phonological constituents (phonemes, syllables) as these correspond to letters and characters. The former is required for speech perception; the latter helps children learn how to read.

The interface question (whether explicit knowledge interfaces directly with implicit knowledge) is probably the pivotal issue at stake in the debate on actual teaching applications. Recall that the input hypothesis does not completely dismiss metalinguistic awareness and (deliberately) learned competence. It claims that the role explicit knowledge plays in attaining final state mastery is “very limited,” that it serves as a monitor of performance. In the end, how limited or how central it turns out to be is an empirical question. But no one denies that it facilitates performance to one degree or another. According to the input hypothesis, practice, interaction (e.g., negotiation of meaning) and FFI contribute to explicit knowledge. Presumably, again, the contribution to ultimate attainment in the L2 is very limited. The claim regarding the *limited effects of practice and interaction* in particular is indicative of how strongly encapsulated the acquisition mechanisms of the LAD are considered to be in Krashen’s model. Practice and interaction facilitate the receiving of comprehensible input (e.g., conversation naturally generates more input), which is the real motor of acquisition, not the cognitive operations deployed in verbal expression. An example of these cognitive operations would be deliberate metalinguistic reflection on the correct form of utterances to make them grammatical and coherent. The cognitive operations associated with reflection on language patterns contribute to explicit knowledge.

The typical examples of acquisition-rich comprehensible input are — meaningful messages in conversation, engaging and interesting reading material, and listening to extended oral discourse. However, it has never been demonstrated empirically that the LAD only accepts and makes use of (for constructing grammars) *only* one kind of discourse or text-type, “naturalistic” or otherwise. The minimum requirement, we can stipulate, would be that a mapping between units of meaning and grammatical constituents, at some level, be effected (this is the essential property, we can assume, of comprehensible input). We can assume, also, that this only applies to higher-order linguistic patterns that are potentially meaningful or that have a grammatical function — at the morpheme-level and above. Requirements for the acquisition of implicit phonological knowledge — at the syllable-level and below (not units of meaning) — we will thus set aside for now.

If the above way of defining usable input (“the minimum requirement”) to the LAD is correct, then this opens the door to considering other instances aside from the typical examples that usually come to mind. In particular we have to consider examples from sources associated with FFI and metalinguistic reflection in learning contexts (where cognitive-general resources are deployed):

1. Especially in applying current methodologies of grammar teaching that embed FFI in communicative lessons, if the explanation of a rule, for example, is given in the target language and is comprehensible, why isn’t this input usable for acquisition? An interesting lesson about language should qualify just as well as one in geography or algebra. If the above-mentioned meaning-grammar mapping is realized, even so-called “uninteresting” content qualifies as long as learners are attentive and engaged. Taking the liberty of paraphrasing Forest Gump, we have to recognize that this elusive quality of instruction is subject to all kind of as yet poorly understood individual variation: “boring is what boring does.” True,

sometimes, despite teachers' very best effort academic content is taxing, and can even get tedious. But, for students who stay in school and work at getting a passing grade in their content-based second language learning classes, it is intrinsically motivating to pay attention to the medium of instruction. Educators' eternal challenge is to keep the fire burning so that as many as possible do stay and work hard on their lessons.

2. In traditional grammar exercises, especially self-paced learning activities popular in many self-teaching situations, now more widespread than ever before via the internet, fill-in the blank sentences, cloze paragraphs, matching activities, self-correction and all variety of like grammar puzzles contain text material that is generally comprehensible, and depending on one's level of motivation and the creativity of the web designer, engaging and even fun (depending on what you think is). These traditional learning activities have been enhanced by modern interactive digital technology to now provide learners with immediate and highly reliable feedback. Recall that we covered this topic in Chapter 6. Is there any evidence that this kind of language input that features systematic focus on sets of related grammatical patterns is not processible by the LAD? If reading in general is a good source of language input at the right level of difficulty, is its usefulness for acquisition restricted only to certain genres?
3. Practicing newly learned grammatical patterns, negotiating meaning, asking native speakers and more advanced L2 interlocutors for clarification, reflecting on similar examples given by native speakers (as positive evidence), getting explanations of why others are non-examples (in the form of negative evidence), and so forth, conceivably all contribute to explicit knowledge. But is it reasonable to claim that they do not contribute to implicit competence as well? The reader is reminded here that we still accept the distinction between the two as psychologically real. As in other kinds of learning and acquisition, peripheral input-receiving processors, both specialized and cognitive-general, distribute incoming information to the relevant modules and other kinds of computational component. But it's not clear in the input hypothesis why input coming from direct instruction and metalinguistic reflection, as it makes its way up the chain of transformations of information specific to the domain of language, cannot also come to be useful to the LAD.

These problem situations now pose the most interesting question — about interfaces. One set of assumptions and a clarification need to be considered. Assumptions first — In both so-called non-interface and interface models that accept one or another version of modularity, separate and autonomous modules are assumed to maintain independence from other cognitive components regarding the kind of knowledge representations that they are designed to “enclose” (carrying out internal computations upon). To review once more, we are assuming separate domains for implicit linguistic competence built by the domain-specific LAD and metalinguistic knowledge resulting from the application of cognitive-general learning. But the question of interactions between and among these components is an *open question* accepted by virtually all proponents of a modular

architecture of language ability. Thus, the terms “interface” and “non-interface” are misnomers in characterizing proposed models that try to explain the relationship between different kinds of language knowledge. No one really denies interaction and interface. Rather, the research problem must be about degrees and kinds of interaction and degrees and kinds of encapsulation; and theorists that do not accept any version of modularity (probably the majority in SLA research today) assume even greater interaction, of a more holistic and “dispersed” kind, in their models of language ability. Implicit linguistic competence must interface with other cognitive domains, of diverse kinds, most notably with systems outside of the Faculty of Language (e.g., in reading, with the visual system). Thus, it falls to proponents of the theory of “no interaction in the direction of explicit to implicit knowledge” to explain why this pathway in particular is blocked - to be clear, Krashen does not use the term “no-interface.”

The clarification — When we speak of input to the domain-specific LAD (the reader is invited to substitute an equivalent acronym — e.g., LMC for Language Making Capacity), this “data,” appropriately called Primary Linguistic Data (PLD), is not the unfiltered and unprocessed audio or visual information present in naturalistic discourse “out there” that is perceived by our sense organs. As was just alluded to, a series of peripheral input-receiving processors transform this information into usable data that the actual acquisition/learning mechanisms are able to compute (Jackendoff, 2007). Thus, the PLD that is derived from naturalistic comprehensible input is data that is now internal to the cognitive workings of the Faculty of Language. Most importantly, the now disaggregated instances of it must be in different formats than when the sound or visual patterns of language were received by the sense organs. In the SLA literature this distinction is informally captured by the difference between input and *intake*. Even more importantly, cognitive scientists all agree that very little is known about the specific details of this very rough idea of how language is processed in the mind for different purposes; and even the rough idea is still controversial.

Returning to our list of possible examples of interface between implicit and explicit knowledge that need to be considered, we can now add a fourth possibility, assuming that within the broad and complex network called language ability, domain-specific components (products of acquisition) must be interconnected in some way with domain-general components (of deliberate learning):

4. We can accept that not only are the two domains independent, but also agree with the idea, which follows from the non-interface hypothesis, that explicit knowledge is not transferred directly to implicit competence domains. However, in general, what interfaces do is communicate competence components and processing mechanisms that are formatted in different ways, with different internal computational structures. Why, for example, might explicit knowledge about language, learned items, memorized collocations and longer unstructured sequences not serve as a data base for system building and the acquisition processes of the LAD? Myles (2004) provides examples and a theoretical rationale for considering the possibility that such information in fact can serve as a data base for the LAD. Recall that we are in the internal realm of the Faculty of Language, with

no consensus about the properties of the various participating knowledge structures or about the constraints on how they interact. It is entirely plausible that domain-specific modules might receive language-related input from cognitive-general domains and process it (carrying out computations on it so that it can in fact be “inputted,” or “intaken”) as Primary Linguistic Data. Note that this hypothetical scenario is not the same as what is known as proceduralization of declarative knowledge¹¹ — refer back to the discussion of this topic in Chapter 3, and the proposal by Marcus (2006) for a critical assessment of the standard version of the concept of modularity, a critique that happens to be pertinent in this concluding chapter as well.

9.3.3 The limits of acquisition and learning

The strong claim is made that deliberate learning is very limited, resulting in metalinguistic knowledge that doesn't contribute to “fluency,” and that accepting the comprehensible input hypothesis will lead to abandoning the teaching of grammar objectives. But this prediction is premature. Generally, both laboratory and classroom studies show gains for learners whose teaching program includes direct instruction (DeKeyser, 2005b), in short term studies usually outpacing comparison incidental and natural approach methods as was shown in the Norris and Ortega (2001) meta-analysis reviewed in Chapter 7. We will return to the methodological problem that is posed by short-term controlled studies, pointed out by DeKeyser, seeming to bias results in favor of Form-focused instruction. Long term longitudinal studies are very rare, but it must be one of the most implausible claims that sustained direct instruction will not result in continued and progressive mastery, even if it may be mainly explicit knowledge that is automatized; i.e. lacking “fluency” (i.e., not sounding like a native speaker).

DeKeyser and Juffs (2005) point out that L2 learners make use of a diversity of resources that their componential language ability makes available to them. As we assumed in the previous section, these resources are not isolated modules but in actual performance support each other, so to speak. Grammar competence transferred from the L1, access to UG principles, cross-language processing strategies, formulaic knowledge and proceduralized explicit knowledge are all called upon in different configurations depending on what the real-time demands of expression or comprehension turn out to be. Grammatical patterns that the learner practices and masters near-natively (they may not really be implicit, but serve the learner almost as well) come together with structures that are implicit and UG-governed. Especially for academic purposes, L2 performance *does not have to mimic native-speaker fluency* and spontaneous on-the-spot correctness to be useful, and can even be adequate for all practical applications for the vast majority of L2 learners.

DeKeyser (2005b) poses a difficult question for the no-interface position that favors an exclusively input-based approach to teaching — Over the long term, deliberate

learning, FFI and direct instruction can establish a foundation of explicit L2 knowledge that significant practice converts into mastery based on high levels of automatized skill. Aside from automatized explicit knowledge being difficult to distinguish from implicit competence, in the end, after extensive practice and proficient use, how can the two kinds of knowledge be kept completely separate, one not effecting any changes in the other? Clearly, L2 speakers use explicit knowledge for more than just monitoring expression when they are focused on form (Ellis, 2006). Even in L1 language use it's not obvious that all competence that speakers access is tacit and subconscious from domain-specific grammar modules. A good part of knowledge of language, in L1, is probably cognitive-general. If this is correct, in L2 an even greater part must be cognitive-general. In both cases, this knowledge is put to use in proficient, and even fluent, expression (and similarly in skilled comprehension). In a scenario like this, learned metalinguistic knowledge can be of great value to beginner students who are motivated and know how to bootstrap what they have practiced in self-teaching and self-organized immersion/acquisition activities such as reading and watching L2 TV.

Far from a hopelessly useless labor in vain, current research on different aspects of Form-focused instruction has become one of the most dynamic areas of scientific work in SLA. A major theme is the question: how can learners attend to meaning and form in teaching situations where classroom activity is centered on a content lesson? Can attention even be “shared” between content and language learning objectives at the same time? Different types of FFI (and in particular different types of corrective feedback), thus, are compared with this research problem in mind. For example, recasts (teacher providing the correct form) may be viewed as less “intrusive” than say prompts/elicitation (suggesting to the student to self-correct). At the same time, the question at hand in this comparison asks: which is more effective in reorganizing the learner’s interlanguage grammar, considering the possibility that recasts might be ambiguous as to their CF intent (their greater perceived “indirectness” being perhaps viewed positively among educators concerned with the effect of CF that is overly “direct”)? Findings have also suggested that the factor of proficiency level may affect effectiveness, lower levels profiting to a great extent from prompts (Ammar and Spada, 2006). Other types of CF that have been studied are clarification request and providing metalinguistic clues. How are these CF types noticed and perceived, then interpreted by learners, and how do they, and in what ways are they able to, respond? Important here are: the feedback dimension of oral-written, the situational context of the feedback, and different kinds of discourse constraint specific to classroom interaction (Pica, 2008; Russell and Spada, 2006; Yang and Lyster, 2010).

This line of research was prompted by the interesting finding from evaluations of second language immersion of a significant plateau effect in grammatical development. That despite years of comprehensible input in the L2-medium-of-instruction, throughout all of the elementary and middle school years, levels of mastery in the domain of morphology and syntax (revealed in expressive tasks) turned out to be surprisingly deficient. The focus of investigators has come to rest on the distinction between indirect/incidental approaches to mastering the language objectives and models of direct instruction. For example, is the well-known technique of negotiation of meaning (systematic clarification request) and other methods associated with the so-called “interaction hypothesis” sufficient to

advance L2 learning? Lyster (2004), for example, is a proponent of studying the cognitive properties and effects of noticing, awareness and controlled practice that includes CF types that prompt self-correction. Within the framework of a communicative approach to L2 teaching, what, more precisely, makes grammatical features salient and maximizes metalinguistic awareness of the relevant grammatical patterns? What kinds of practice are workable and efficacious, e.g., in creating obligatory contexts of use for the target features in content-based L2 teaching?

The last question goes to the heart of new applications of immersion teaching (integration of grammar and content objectives; review Chapter 7). How can attention be directed most effectively to grammatical features that are not normally noticed? With focus on meaning as a starting point (the consensus today among educators interested in optimizing L2 grammar development), how are form-meaning mappings established consistently? Batstone and Ellis (2009) and Ellis *et al.* (2006) review the above-mentioned research problems in the previous paragraphs from the point of view of a Focus on Meaning framework (a term in the professional literature often, and unfortunately, associated with zero-grammar, simple-immersion, approaches). Today, in contrast to traditional grammar teaching of the past, FFI in language teaching assumes a Focus on Meaning (Dutro and Moran, 2003). This is a point of discussion around which there should no longer be any debate.

9.3.4 Language awareness in literacy-related academic abilities

The *Lectures* make passing mention of the development of language abilities for academic purposes. In a short section entitled “Acquisition without output,” de-emphasizing practice and the importance of metalinguistic awareness is suggested again, but now extending this natural approach acquisition model beyond SLA proper. What by all estimates must count as a very strong claim, the “competence from input alone” hypothesis (p. 62) is applied to a literacy skill — spelling. If research is beginning to suggest that casting a broad equivalence between primary language development and L2 acquisition/learning is not correct, extending this input-alone hypothesis to another, even more unambiguously, secondary domain (literacy) now raises the theoretical stakes another notch. Elsewhere, in fact, Krashen (2004) makes this extension explicit.

Before proceeding, it’s important, especially here, to reemphasize that what educators are most interested in is not what is possible (theoretically, or to an approximate and mediocre level of mastery), but rather the most effective and efficient instructional model for students — it’s about rate of mastery and ultimate attainment, of *advanced* ability. As was mentioned in the introduction to this chapter, few researchers deny that input-alone immersion (e.g., extensive reading for developing skill in spelling) results in progress toward increased ability. But in second language learning, and now L2 literacy, educators and investigators have a more difficult problem to attend to — that of maximizing achievement, for instance, in the case of vulnerable populations and less privileged

students for whom working against the clock is not just a saying. Most bilingual and second language learners are not at liberty to view the considerations of efficiency and ultimate attainment as optional; and for teachers what is “interesting” and “fun” in the abstract, is not the best starting point for designing a second language and literacy-learning program. Returning to the “competence from input-alone” proposal for the mastery of the sub-skills of writing, the overarching motivation for this most implausible hypothesis appears to be the endorsement of a strong version of whole-language philosophy (Krashen, 2002, 2004). For example, the attempt is made to discredit the growing consensus on the importance of phonics and related word identification skills, including the development of phonemic awareness and other kinds of metalinguistic knowledge associated with literacy learning. For alphabetic writing, see de Graaff *et al.* (2009), Dehaene (2009), Ehri (2005, 2009), Perfetti (2010), Shankweiler and Fowler (2004). For morphosyllabic writing, a somewhat different but converging discussion on the importance of metalinguistic awareness in relation to the processing of characters has taken on central importance among researchers (Chung *et al.*, 2011; Lei *et al.*, 2011; Liu and McBride-Chang, 2010; Mori *et al.*, 2007, to mention just a few). Review the background to this discussion in Chapter 4.

To recap, young children’s acquisition of their L1/MT can indeed be described as naturalistic (in the truly biological sense), unfolding in response to adequate input-alone conditions of comprehensible language experience, the simple positive evidence of Primary Linguistic Data, without practice or corrective feedback, precisely because it is a universal *primary* human attainment. The achievement of literacy ability is a secondary attainment, in human evolution and historically, cross-culturally and socially, developmentally in children, and within each culture subject to interesting and as yet incompletely understood wide individual variation. More interesting in some ways is a hypothetical parallel — second language acquisition/learning appear to share some of these secondary properties. From this point of view, upholding the opposite parallel — that neither L2 acquisition/learning nor literacy are secondary, in the sense that they are characterized in this chapter — is a mark of consistency, but one that becomes harder to justify when we cross the line into academic literacy learning. In contrast, one can maintain the primary characterization of L2 development — that L1 and L2 are epistemologically equivalent (Schwartz’s, 1998, formulation) in every way — while not extending it to literacy learning. Krashen applies a version of this equivalence across the board, a kind of whole language theory for all: reading, writing and second language. The approach to L2 writing instruction that rejects corrective feedback, for example (Truscott, 2010), would be consistent with this view.

In response to the popularity for many years of holistic models that tended to relegate the role of the teacher as instructional leader and organizer to the background, new approaches to immersion teaching have emphasized the idea of an active and systematic integration of language learning objectives in content-based teaching (and away from the view of simply working on content in the target language). This reconceptualization of content-based L2 teaching that takes such an integration seriously recognizes the important connection, especially for L2 learners, between the special demands of academic language proficiency and mastery of the grammar objectives of the second language program. In

this approach, direct engagement with students starts with a focus on purposeful learning activities with special attention to prerequisite language objectives for understanding academic content. Ongoing *formative evaluation of learner achievement* points to other language objectives that emerge from the analysis of specific functions served by grammatical forms (during the content lesson). Compilation of interlanguage errors from student performance is an ideal source of new material to cover and old material to review. Prior teaching and post re-teaching is thus systematic. Selection of language objectives begins with grammar that is specifically useful for academic tasks:

- comprehension of complex patterns of expository textbook discourse,
- comprehension of similar expository discourse that L2 learners must process in classroom explanations, demonstrations, and laboratory reports,
- coherent formulation of complex clarifying questions and expositions, and
- mastery of academic writing abilities.

Dutro and Moran (2003) elaborate on all the above with special clarity; readers should take it as a follow-up to the discussion in Chapter 7 of the new approach to immersion: Bigelow et al. (2006), Schleppegrell et al. (2004) and Snow (2005).

9.3.5 Evidence from empirical studies

Almost everyone agrees that findings from research on SLA are uneven; that interpretations of results usually have to be heavily qualified and that controlling relevant factors in the study of language learning has been difficult, especially in head-to-head comparisons between incidental/whole language and direct instruction/FFI. In the comparison between the precision of experimental studies and the potentially more favorable validity of harder to control classroom studies, the advantages and limitations of each kind of approach are often hard to integrate into a single and unified analysis. As DeKeyser (2005b) and Pica (2008) point out, laboratory studies tend to show an advantage for direct instruction and FFI; but because they are uniformly of short duration, this condition appears to bias them against incidental and input-only methods. It can also be argued that the preference for discrete-point measures, over open-ended and holistic performance assessments favors access to explicit knowledge. Open-ended and spontaneous communicative tasks require, presumably, higher levels of tacit competence. However, if incidental/whole language methods benefit from longer durations, then the proper longitudinal design for comparison would also call for systematic long-term direct instruction. We can grant that performance on measures of spontaneous use, requiring automaticity, fluency and native-speaker like accuracy reflects implicit competence. But performance on tests is not necessarily *only* an index of learned explicit knowledge. With competence alone and no relevant metalinguistic knowledge, speakers (of L1 and of L2) can respond correctly on discrete-point items, and performance on the same items by beginner level interlanguage speakers will on

average be inferior for lack of both tacit competence and explicit knowledge. Results from assessments with well-designed test items can reveal complete or incomplete competence in specific domains of language knowledge and associated language-related skills. Test data, like all data, suffer from specific and usually well-understood shortcomings. But if results are reliable, they need to be explained. If we discarded research findings that cannot eliminate all margin of limitation, there would be nothing left standing, including findings from “contextualized” research with high ecological validity.

In classroom studies, of both qualitative and quantitative varieties, a different set of advantages and defects (some of the advantages and defects are the same) have to be balanced against each other. The principal limitation so far has been how to ensure clearly contrasting applications of the comparison treatments — input-only immersion without FFI, and more problematically, FFI without enriched comprehensible input now that traditional rule explanation in students’ L1 followed by non-communicative drill is no longer an alternative model of interest to anyone. Also, systematically structured input and different kinds of inductive method can fall under either paradigm, depending on subtle distinctions that are not easy to make; see the discussion of these problems in DeKeyser (2005b).

In Chapter 3 of *Lectures*, which critically reviews previous studies, Krashen correctly raises a related issue — in a comparison to a structured instructional program in which learners are engaged face-to-face, everyday with a lesson plan-equipped and task-oriented second language educator, the comprehensible input/whole-language alternative better be of comparable engagement and richness in processible Primary Linguistic Data. If the non-FFI whole language instructional style is too hands-off or radically constructivist, all bets are off. Indications from a number of studies that in some of the input-only conditions instruction was not sufficiently acquisition rich, in fact, is one of the important criticisms of the research reviewed in Krashen’s Chapter 3. The point is well taken, and surely rings true to many educators from experience conducting informal observations of teaching that eschews direct instruction.

But readers will be excused for becoming suspicious of this argument upon encountering it in the concluding section of *Lectures* Chapter 3. Citing the seminal studies of early French immersion from Canada that called attention to broad deficiencies in students’ grammatical competence (Swain, 1996), the not-sufficiently-acquisition-rich explanation is proposed again — perhaps reading and listening materials were not “interesting” enough, and that “we haven’t yet given comprehensive input a real chance” (p. 65). But this suggestion fails on all counts. Comprehensive input in the French immersion programs was nothing less than massive, for early immersion students, starting in kindergarten, spanning all elementary grades and extending into secondary school. Through 6th grade, up to a major fraction, more than 50%, of total instructional time would typically be in the target language. Engagement with both content and language objectives in this variety of comprehensive CLT should be a given for all program completers. With French as medium of instruction, *motivation* to understand messages in the target language must have been uniformly high among students who remained in immersion as they complied, on average, year after year, with all academic subject area expectations,

with the only exception being that of L2 grammar in expressive tasks. Refer to Swain and Lapkin (2005) and related citations in Chapter 7 for a summary of this assessment. What is meant by “interesting” in Krashen’s critique isn’t always well defined; but in this case the objections clearly don’t stand up to what we know about these immersion programs.

For one last time, it’s important to emphasize that the research problems outlined in this chapter have not yet been settled. Thus, the arguments presented here in favor of an integration of meaning-focused and form-focused language teaching should be taken as alternative hypotheses that might help us design better experiments and naturalistic classroom studies.

9.4 Looking back — Main ideas

This last point about further investigation brings us to the final conclusion, concentrating the discussion on our fourth overarching theme: a contrast between two lines of theory and practice in second language teaching. Enough has been said about the debate on pedagogical issues in this chapter and Chapters 5, 6 and 7. Truly, the contrast between holistic/incidental and direct instruction approaches has been one of the most enduring in the fields of language and literacy learning. Why that is should be a topic of serious reflection in its own right, for example why the research biases of one tendency and the other turn out to be remarkably consistent from one domain of language ability to another. This is probably a good thing in this case, as it should allow for the confrontation of hypotheses at a higher level.

Our third theme, if the reader recalls, fed into the very same debate. Starting off with the idea that reading ability can be broken down into component competencies and skills, this approach led to a proposal for research about universal underpinnings shared by all literate cultures. One of the universals of reading may be about how phonology plays a role, that it cannot be by-passed in decoding text; that it cannot be by-passed in alphabetic systems nor in morphosyllabic systems. If this hypothesis turns out to be correct, the development of decoding skills that correspond to the linguistic components of the language would appear to be essential, essential for children in literacy learning, for example. That is, proficient reading is more than just predicting and constructing meaning. Even in reading Chinese (where it might be tempting to propose a direct and exclusive orthography-semantics route), it appears that comprehension processes cannot normally by-pass phonology. A componential, or modular, approach to understanding reading ability also favors the view that in processing written language, some (so-called lower level) computations are obligatory. This is the opposite of a strong top-down view that higher-level processes predominate and can freely override bottom-up processes. Interestingly, whole-language approaches tend to be strongly top-down, and de-emphasize the importance of direct instruction that fosters efficient word decoding skills that attend to linguistic components (e.g., fast and automatic mapping of orthographic forms to phonological patterns). The discussion here is entirely parallel to the one we just covered

in the field of second language acquisition, an example of the theoretical consistency just mentioned.

Working backwards to recapitulate Chapters 3 and 2, it was the underlying architecture of bilingual competence and ability that concerned us. Again, the idea of componential design came forward as a useful tool of analysis. Two kinds of imbalance in bilingualism helped us think about the relevant research problems more analytically — the typical imbalance of stronger and weaker language (by far the most common type of bilingualism), and the imbalances occasioned by impairment of different kinds. One of the main ideas in these chapters was that asymmetry reveals internal diversity more clearly, better than when systems and subsystems are in equilibrium.

On the topic of bilingual mental architecture the lines of debate are not as clearly drawn as in the area of literacy and language teaching, the research being much more complex, more cross-disciplinary, and about phenomena that are hard to observe directly. For this reason, trying to draw the lines sharply is not a good idea. Investigators should consider what appear to be opposing viewpoints with an open mind, and in general proceed cautiously because things are often not what they initially seem to be, to put it plainly. Proceeding with caution isn't the same as avoiding controversy; but in this still new area of research the best way forward is to first establish a common platform from which further discussion can go forward. The introduction to this chapter started with this idea. Sometimes this can begin with agreement on the facts of an empirical finding, say, about an aspect of performance in which the two language subsystems of the bilingual are involved. Candidates for broad agreement might include:

- The ability of young bilingual children to separate in usage the two languages that they know is demonstrated early in development. The achievement is impressive, and still not well understood.
- One of the languages often develops as the dominant/stronger language, the other as the weaker, even when bilinguals are exposed to both. It's still a mystery why this happens.
- Language attrition in normally developing bilinguals is evidenced only in one language or the other. Attrition or long-term delay in both is evidence of pathology.
- At the same time, balanced bilingualism, with equal competence in both languages is possible, and widely observed.
- Bilingualism does not cause language deficiency, and it does not result in cognitive impairment of any kind. Knowledge of only one language doesn't either.
- Second languages do not develop in the same way, in all respects, as first languages.
- Nevertheless, bilinguals can attain very high levels of proficiency in their second language.
- All modern writing systems, cross-linguistically and cross-culturally, appear to share certain properties. The way that readers process them also shows parallels.

- Digital technology has changed the way we process language in the most profound way ever. The way it has changed how we understand written language processing cross-culturally, and across writing systems, is new and very important.

While consensus on a short list of plausible explanations for any of these observations is not yet possible, excluding the most implausible ones should be. Because all researchers in the cognitive sciences work with the same rules of evidence, agreement on what the competing hypotheses are and on the kinds of assessment that can be implemented as valid tests of one or the other hypothesis charts a path for real progress. Work on the resulting shorter list of explanations would go forward as we build a broader common platform of concepts and proposals. Such methods assume an optimistic view of the power of scientific inquiry. So it is with an assumption that we are concluding this book, even though that's how discussions usually begin, or begin again.

Notes

1. An important concept from psychology comes to the field of language learning in the distinction between declarative and procedural knowledge. Perhaps the clearest example of declarative knowledge we would find in traditional foreign language teaching in which a grammar rule is learned and understood (e.g., it can be explained) and illustrative examples provided by the learner. Applying the rule to a variety of grammatical patterns and receiving relevant positive and negative evidence, leading to extensive practice in situations where performance can be monitored easily (as in writing) and in spontaneous interaction, declarative knowledge is automatized — proceduralized. In similar and analogous scenarios of deliberate learning, this kind of transformation of one kind of explicit knowledge to another is probably a correct portrayal, more or less, of some aspects of L2 learning. But at the same time, it should also be clear that there are other kinds of language development. Also of the explicit knowledge type would be purely inductive learning. And most importantly is the kind of acquisition that is characteristic of child L1 development, resulting in tacit competence — in this case, declarative knowledge of grammar is not an issue at all. Then, neither would be the idea of proceduralizing this kind of knowledge. Lastly, if we accept that some domains of L2 grammar can and do develop in a manner guided and constrained by UG to some extent (still a controversial claim), the declarative → procedural progression would not apply either. See DeKeyser's informative chart in (2005, Figure 11.1) for an explanation of how "deductive" does not always correspond to declarative procedural. For example, UG-constrained acquisition mechanisms can be thought of as "deductive."