

Only Connect: The Interface Debate in Second Language Acquisition

Michael Sharwood Smith

Abstract One commonly used term in recent second language acquisition literature is *interface*. It is used in different senses. Even for those who have adopted a generative linguistic approach to second language (L2) development, there are alternative views. Frequently, the focus is on interfaces that mark the boundary between the inner core of language that is governed by cognitive principles that are unique to language and those areas which lie outside. Here, the talk is, for example, of the syntax/pragmatics or syntax/discourse interface or the syntax/phonetics interface (cf. Sorace 2010). It is often stated that sources of difficulty characteristic of L2 acquisition may not be located within the core area, but rather in how it connects with structures outside, i.e. across the relevant interfaces. For example, while learners whose L1 requires grammatical subjects to appear in all contexts, may rapidly acquire the empty subject position of null subject languages like Polish, they have persistent difficulties in identifying what, pragmatic or discourse factors dictate their use in certain contexts rather than in others. However, there are also approaches that explain interfaces somewhat differently, namely those inspired by Jackendoff's proposals concerning the language faculty (Jackendoff, 1987, 2002; Carroll, 2001, 2007; Truscott and Sharwood Smith, 2004; Truscott and Sharwood Smith, forthcoming). Such approaches add a badly needed processing dimension to the debate. There are also emergentist approaches that do without interface-based distinctions, such as O'Grady's (2005), which require interface problems to be explained in different ways.

M. Sharwood Smith (✉)
The Academy of Social Sciences, Warsaw, Poland
Heriot-Watt University, Edinburgh, UK
University of Edinburgh, Edinburgh, UK
e-mail: msharwood@blueyonder.co.uk

1 Introduction

One thing we learn from linguistics about the notion of language is firstly that, though it can be grasped in a very general sense, it is a very vague, fuzzy notion, difficult to define clearly. Secondly, in order to really get to grips with it, it has to be broken up into much more clearly defined sub-areas like syntax, phonology, semantics and pragmatics, all of which have their own particular sets of rules and principles. This does not mean the way of dividing up these areas is straightforward. In fact, it depends very much of the theory behind the description what, say, counts as grammatical. Traditionally, definite and indefinite articles in English are classed as 'grammar' because they are function words but some would argue that the article system (or, if you like, determiner system) itself is part of morphosyntax but the shape these forms take is a lexical and phonological matter, and the way they are used in varying contexts is more to do with semantics and pragmatics. Is everything then 'grammar'? In other words, even this particular linguistic term is problematic. Then, for language learning research and hence for language teaching research as well, the question arises whether each and every one of these sub-areas can be acquired in the same way, i.e. whether the same learning mechanisms are involved. For those approaches to learning that see all human learning, that is all cognitive development, as proceeding in the same manner, governed by the same mechanisms, the differences between learning usage aspects of a foreign language, pragmatic rules, and learning syntax will be relatively small and be more a matter of varying complexity than anything else. If, on the other hand, you follow a more modular approach to the human mind and particularly one which espouses some form of specialised language faculty or *language module* that is markedly different from other cognitive areas of the mind, then you may find that these differences may be much more pronounced.

In the discussion that follows three recent approaches to the mechanisms of language acquisition in real time will be compared, one that adopts an approach that says all learning is governed by the same principles and two alternative approaches that do not adopt this position. Each of these alternative approaches is based on one particular model of language in the mind. However, they do differ in how they account for language development. A key term in any modular approach, is the term *interface* which, very roughly phrased, requires us to distinguish: (a) the way in which we acquire the core grammatical system and (b) the way in which we learn how to make that system work, that is, how we should link up the basic system in order to perform in a native-like way in everyday speech and writing. The core system, so some claim, can be acquired perfectly by proper exposure to language in use. For the second type of language learning, bridging the gap (interface) between the basic system and various types of usage, continuous exposure to the language brings with it no guarantee at all that much will be acquired. The implication for teachers might be that intervention should be concentrated on this second area. This general idea may well hold no surprises for experienced language teachers but the devil is in the detail. A proper theoretical framework is needed to pinpoint and explain exactly what these 'interface problem areas' might be.

2 O'Grady's (2005, 2008) Emergentism

The first approach is an emergentist one. This is a useful option to consider first since it contrasts with the other two in that the debate about interfaces is rendered irrelevant or trivial if an emergentist approach is adopted. O'Grady (2008, p. 448) defines emergentist approaches as follows: "[t]he phenomena of language are best explained by reference to more basic non-linguistic (i.e. 'non-grammatical') factors and their interaction—physiology, perception, processing, working memory, pragmatics, social interaction, properties of the input, the learning mechanisms, and so on". This approach is attractive because it puts all kinds of learning into the same explanatory framework. In other words, it denies that we need to resort to the idea of a special language module to properly account for language acquisition, particularly in the young child. Because it avoids that additional complication, it therefore can be characterised as a parsimonious approach like a number of other approaches including those following the tenets of behaviourism, connectionism and also including many cognitive psychological approaches to learning. Of course, if such approaches cannot properly account for the emergence of a complex grammatical system in the untutored, cognitively immature child with relatively few errors and without explicit correction, then the arguments against the existence of language faculty will not hold water. The question of child language acquisition aside, it may still be the case, however, that such specialised language mechanisms operating within the constraints imposed by what is generally known as Universal Grammar (UG), if they exist, cease to operate in early childhood leaving older learners to rely on the framework set by their first language system and general learning strategies for acquiring any new language (Chomsky 1965; Selinker 1972; Bley-Vroman 1990, 2009). Again, this is also a hotly contested issue (Krashen 1985; White 2003; Goad and White 2008).

Unlike a number of radical emergentist approaches, O'Grady's version accepts that an account of acquisition must deal in terms of symbolic representations and not interconnected nodes that do not represent anything. Linguistic development proceeds in the same manner as any other kind of cognitive development as the outcome of repeated exposure to linguistic utterances. Crucial to his account is the notion of an efficiency-driven processor which processes utterances in small chunks (segments, morphemes) in linear fashion, as they are encountered. This processor is not constrained by anything like UG and does not have any particular sequence imposed on it by a special 'language acquisition device', an early idea of Noam Chomsky's that was interpreted by acquisition researchers in the 1960s and 1970s as responsible for fixed orders of acquisition of, in particular grammatical morphemes (Chomsky 1965; Brown 1973; Dulay and Burt 1974). In the case of language, the actions of O'Grady's processor results in the gradual emergence of operations and sequences of operations that are required to form and/or interpret sentences (O'Grady 2005, p. 93). Acquired linguistic properties are the outcome of samples of language encountered by the learner interacting with the efficiency-driven linear processor.

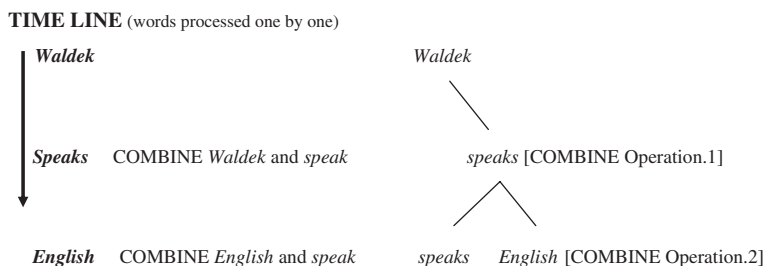


Fig. 1 The COMBINE operation (adapted from O’Grady 2005, pp. 8–9)

It is appropriate to give just a few details of how O’Grady’s (2005) model works. During the parsing of incoming input, the *Combine Operation* adheres to an imperative, which is: ‘MINIMISE BURDEN ON WORKING MEMORY’. This is accompanied by a simple *Efficiency Requirement*, which says ‘RESOLVE DEPENDENCIES AT THE FIRST OPPORTUNITY’. Figure 1 provides a simple example of this (‘Waldek speaks English’) of how this combining operation works out in practice. This assumes that what he calls the ‘functor’ in the lexicon, which here is the verb ‘speak’, carries the following information: 2 arguments, one left, one right (see O’Grady 2005 for more detailed explanation). At an early stage in processing, since some form-meaning relations can be inferred without syntactic knowledge (O’Grady’s ‘bootstrapping assumption’), a word is assigned an interpretation, and a conceptual structure (the meaning) for the incoming sentence begins to be projected (O’Grady 2010a, b). Words are processed in linear order, one by one. With verbs, a search begins for arguments belonging to the verb in the lexicon—the nominals to the left and/or right (‘Waldek’, ‘English’) are then given an appropriate interpretation (say, ‘agent’ or ‘theme’).

After the *Combine Operation* has been executed, another one, called the *Resolve Operation*, will, at the first opportunity presented, match up the nominal with the argument requirement in the verb so, in this example, ‘Waldek’ can be, and is therefore immediately matched up with the appropriate argument provided by ‘speak’. This is called *index copying*. The efficiency-driven processor does, O’Grady says, the best job it can “given the hand it is dealt with” (2005, p. 12), although the lexical properties of words may not always facilitate processing. The general idea is that, as more and more input is processed, the learner develops computational routines to handle the language. More properly phrased, appropriate computational routines ‘emerge’.

Overt grammatical correction by a third party, a teacher say, is not included in this approach. However, something still needs to be said at this appoint about the automatic *self-correction* of errors. In O’Grady’s model, there is certainly no language acquisition mechanism responsible for monitoring progress and stepping in to repair and adjust the current L2 grammar. Take basic word order, for example. If the first language of the learner is a verb-final language with: (a) the (correct) default L1 order being the literal equivalent of ‘(Waldek) English+speaks’ and (b)

the target language (L2) being a verb-initial language with the default order of the verb phrase, being, as is correct in English itself, (Waldek) ‘speaks+English’, this will mean that efficient processing routines for the verb-final L1 turn out to be inefficient in processing the verb-initial L2. In such cases, the learner’s computational system will err from time to time. In the case of L2, initially dominant L1 routines will be initially easier to implement but some of these will obviously prove to be inefficient. New computational routines will evolve simply in accordance with the efficiency requirement. No error detection is necessary and hence no repair needed by any special language acquisition device, which, of course, in O’Grady’s model, does not exist. Provided the errors have detectable consequences, for example, a dependency is not resolved or the resulting interpretation of the utterance is implausible, faulty computational routines will be dropped in favour of routines that avoid such problems. The problem-avoiding routines will be strengthened as a result of further processing of the L2 and no appeal to special grammatical principles is needed to account for this. So, in O’Grady’s emergentist approach, learning consists “largely of the emergence of efficient computational routines” (2005, p. 193). The addition of ‘largely’ reflects the fact that the development of routines is usage-based so that a transitive verb like ‘speak’, could initially look for both of its arguments, say, to the right but on encountering English L2, the learner will develop the appropriate left and right look routine (O’Grady 2005, p. 195).

Most people would acknowledge that learning an L2 involves various forms of internal competition as the new system is gradually developed against the background of an already established one—in a bilingual situation this would mean the mother tongue (L1). The characterisation of this competition involved will differ according to that approach adopted. In the case of O’Grady’s model, it is the computational routines that compete following general cognitive principles of construction that hold across all domains, including language.

3 Interfaces

The term *interface*, as it is used in current debates within the field of second language acquisition, assumes approaches to language acquisition that, unlike emergentist approaches, do espouse some version of a language faculty. In one sense, *language faculty* is a misleading term since by no means does it cover all of what we generally associate with the term *language*. Rather, it refers to the core grammatical system and hence excludes some if not all of semantics as well as pragmatics, phonetics and a great deal of what falls under the rubric of *lexical*. No one but no one would argue that these areas are not crucial to what we understand by language, and acquiring a language. The term *interface* is accordingly used to refer to the connections between the inner core (governed by UG) and this substantial outer ring of systems. This accordingly gives rise to such terms as the *semantic interface*, the *pragmatic interface*, the *phonetic interface* and the *lexical interface*. The question posed in such debates is how we are to account for the

obvious problems that second language acquirers encounter, especially in later stages of development, where they seem to fall somewhat short of a native-like level of ability, even after many years of exposure to the target language. Some point to evidence that second language acquirers are perfectly able in the right circumstances to acquire the basic system and by so doing indicate they can still use the language faculty that guaranteed them native ability in this area of their first language. Where their problems arise, as older learners, is precisely in linking up the basic system with the outer areas. For example, a Polish learner of English can acquire a system that, unlike Polish, requires all subjects to be filled, including all subject pronouns that appear communicatively redundant or illogical (as in ‘*it is raining*’: compare with Polish ‘falls rain’, i.e. ‘*pada deszcz*’) and can do this even though encountering English utterances does not rule out in principle the possibility that sometimes you *can* leave them out.¹ However, although the same learner can also acquire the determiner system (DP, determiner phrase) that Polish also does not possess (having no articles only demonstratives like ‘ten’ and ‘ta’) actually acquiring the ways in which the system is implemented to express various semantic and pragmatic means is quite another matter and is typically problematic. This connection or implementation problem is precisely what is meant by problems at a given interface (see extensive discussion in Sorace 2011 and peer commentaries in the same issue).

4 Modularity According to Jackendoff (1987, 2002)

Whereas O’Grady’s (2005) emergentist model assumes no special language module, that is no UG, the remaining two approaches to be introduced do. In view of the compelling evidence (*pace* O’Grady and others) of a special domain dedicated to handling human language, a matter which is debated extensively in the literature, they both adopt an account of the language faculty promoted by Ray Jackendoff (see discussion in Hauser et al. 2002 and Pinker and Jackendoff 2005). In other words, they diverge from the orthodox Chomskyan model although they belong to the same tradition (Jackendoff 1987, 2002).

The attraction of Jackendoff’s framework lies in the extent to which it goes beyond syntax and phonology to elaborate, more than any other model, the connections or ‘interfaces’ between these two core aspects of language and cognition in general. In addition, he has incorporated in his theory an account of language processing which is absent from Chomskyan approaches, which are deliberately limited to talking about grammatical properties in abstract terms and not how they are used, or acquired in real time. One could also perhaps add that the modular architecture that he proposes allows for some flexibility as to which particular

¹ Leaving aside the question of whether you can apply a consciously learned rule to insert pronouns where instinctively you wanted to leave them out (Krashen 1985; Sharwood Smith 2004).

SENSORIMOTOR SYSTEMS ⇔ PHONOLOGY ⇔ SYNTAX ⇔ CONCEPTUAL SYSTEM

Fig. 2 The language faculty: internal and external interfaces

linguistic account can be applied to the explanation of syntactic and phonological properties, although his own preferences are clear especially in more recent publications (Jackendoff 2002; Culicover and Jackendoff 2005).

It is worth introducing some basic features of Jackendoff's modular architecture before going on to talk about the last two approaches. Although it can be discussed as an abstract system of rules and principles in the same way as any classical Chomskyan account, it is much more convenient to use his on-line processing version, this being the aspect that is most relevant to what will be discussed later. This means including an account of how memory operates, a feature left out of a purely property-based description. Memory is important for on-line processing at any given moment since it involves temporary storage of items in working memory as well as access to items in longer term memory. It is also important for acquisition since this must involve changes in memory.

In Jackendoff's account, the domain-specific faculty that is part of our biological endowment consists of two separate largely autonomous modules, one dealing with phonology and the other with (morpho)syntax. There is an *internal* interface that puts phonological properties 'in registration with' syntactic properties, and *external* interfaces that put syntactic properties 'in registration with' items in the conceptual system and phonological properties 'in registration with' those sensorimotor systems which handle perception and production. This is displayed in Fig. 2 with the internal (core) system in boldface. The debate in second language acquisition about interfaces touched on earlier can be reformulated as having to do with the external interfaces that link up the two dedicated linguistic modules inside to systems that are external to this core linguistic system. Each of the interfaces that are represented in Fig. 2 can be said to be governed by principles that differ qualitatively from those that govern other cognitive systems, in other words UG principles. This means that UG shapes not only the way elements of morphosyntax and phonology are combined but also how these elements are combined with elements outside to create speech and writing patterns, and patterns of conceptual structure used in comprehension and production of spoken and written (and signed) utterances. The internal interfaces between phonology and syntax display high connectivity: some elements are in close correspondence (a phonological 'word' is very similar although not identical to an equivalent category in syntax, for example), whereas areas linked up by what are here called external interfaces are not so richly interconnected.

'Putting into registration with one another' should not be misunderstood as 'translating' one thing into another: what happens is that elements (structures, structural combinations) in one module get matched up by the intervening interface (the bidirectional arrows in Fig. 2) with others in a separate, adjacent modules, thus forming a chain of distinct types of structure, each originating from a

Auditory-acoustic processing ⇔ phonological processing ⇔ syntactic processing ⇔ conceptual processing

Fig. 3 Processing of incoming speech

separate module. For example the complex phonological structure /valdek/ will be matched up with a syntactic structure like NP (Noun Phrase) plus associated features like number (singular), gender, where there is grammatical gender (masculine) gender, animacy and so on. The syntactic structure will, in turn, be put into registration with (matched up/interfaced with) a complex conceptual structure, i.e. representing a particular combination of meanings reflecting all the relevant facts that speaker knows about this person in question in this context. This extends the chain one link further and we end up with a prototypical word ('Waldek'). Lexical items or lexical 'entries' do not exist as such: they are better described either as 'rules' coindexing structures across completely separate systems or, alternatively, since we are talking in processing terms, as 'chains' which consist of a phonological structure (PS) in registration (coindexed) with a syntactic structure (SS) and conceptual structure (CS) thus: $PS \Leftrightarrow SS \Leftrightarrow CS$, with the bidirectional arrows indicating the interfaces.

To sum up, the processing of incoming speech involves the operations depicted in Fig. 3. The arrows are bidirectional because processing is incremental and can work in both directions. Several candidate chains are temporarily maintained in working memory so a best-fit can be achieved. This means there are some repeated to-and-fro passes through the separate modules before a chain of representations are selected. Also the same system is implemented in reverse in order to move from meaning (conceptual structure) through to speech or writing.

Turning now to the question of memory, this, in Jackendoff, is also modularised to reflect the architecture just described: not only is there a separate *conceptual memory*, but also a *syntactic memory* and a *phonological memory*, each with their own unique types of structure. Processing within a module involves a dedicated processor whose task it is to assemble items (i.e. properties, structures, representations) that appear in its own working memory and according to the unique principles of that module. The phonological module is the only place where phonological structures can be formed and processed, and the same holds for syntactic structures and the syntax module. Only a subset of items in memory can be processed at any given moment: processors handle only those items from that store that appear in working memory. *Working memory* is an area where structures in long term memory are temporarily activated sufficiently strongly to allow manipulation on-line. The more a structure is established in memory, the more easily it is activated enough to appear in working memory. This means that, in principle at least, frequent exposure to a structure will increase its chances of being used in performance. However, it is possible that some aspects of an utterance will not be processed deeply enough to make it as far as the linguistic system. Mere exposure to language alone does not guarantee anything.

Jackendoff seems not to pursue the question of how knowledge about language, metalinguistic knowledge that is accessible to awareness, can be characterised. It seems plausible that he would treat it as something handled in conceptual structure. Both of the approaches discussed below certainly see it in those terms. Hence, the (explicit) knowledge of what a word or syllable is, or what a rhyme is up to and including an extensive technical knowledge of how the Polish case system works is all constructed in the conceptual system and encoded in conceptual structure (Sharwood Smith 2004). The language modules, as it were, know nothing about it. They just do their job processing what comes in. To use Carroll's (2001) example, the metalinguistic concept FEMININE is qualitatively different from the morphosyntactic gender feature required for languages like French (and Polish) but not English; in other words learning facts about French or Polish gender and related concepts is quite different from creating appropriate representations in the phonological and morphosyntactic systems described above (Carroll 2001, p. 152ff). This may be interpreted as theoretical backing for the distinction familiar from the early second language acquisition literature and associated with the views of Stephen Krashen, who drew a sharp line between an intuitive knowledge of grammar, inaccessible to conscious introspection, on the one hand, and, on the other, the kind of technical knowledge about grammar that is learned consciously in traditional formal education (Krashen 1985).

5 Carroll's (2001) Autonomous Induction Theory

Carroll's (2001, 2007) own approach, based on Jackendoff, provides a particular view of how the acquisition of language takes place. Change in L2 grammars, in her model (Autonomous Induction Theory) is based on the notion of *failure-driven* learning (see also Wexler and Culicover 1980; Schwartz 1999). Each of the levels of linguistic representation, phonological, syntactic, etc., and each of the interface rules that map one level of representation on to another, have a given set of properties at a given point in development. The question is, is this fully compatible with the utterances that are currently being processed? This kind of question is probably pre-theoretical in that any account of acquisition will have to ask it. Recall that in O'Grady (2005) this was a matter of efficiency. The parser will try and do its job but will always be seeking ways of increasing efficiency and will create new or revised operations on this basis. In Carroll's system, the question is similar: is the input to a particular level of representation entirely consistent with the current state of the system? If so, there is no reason for change, except in the sense of strengthening the current state (as mentioned earlier). However, if the answer is no: the input cannot be assigned a full representation by the current configuration of properties, then there is parsing failure. At this point, special learning mechanisms kick into change either properties inside the relevant module (level of representation) and adjust the appropriate interface rules in order to accommodate novel input. It should be noted in passing that it was Carroll who first stressed

the importance of a proper definition of input. As far as she was concerned, language to which the learner is exposed cannot be called *input* but rather should be renamed *stimuli*. Input is an internal event and therefore refers to later stages of processing, that is, input into one or other of the mental subsystems, i.e. levels of representation, hence the remark earlier about the general effect or non-effect of frequency of on the strength of already existing elements in the various modules involved in language (see also Zyzik 2009).

In cognitive psychology in general it is assumed that concept learning proceeds according to various problem-solving strategies, a key one being induction, drawing conclusions from instances, which can be, although does not have to be, a quite conscious process. This kind of inductive learning process is specifically rejected as a satisfactory account of language acquisition by those espousing some form of language faculty. Indeed the failure of inductive reasoning to account for young children acquiring grammar is a *raison d'être* for positing the existence of a language faculty. It is also not the kind of induction that Carroll (2001) attributes to her language acquisition device. She adapts Holland et al.'s (1986) induction theory to conform with the principles of Jackendoff's architecture. This means that, instead of working in an unconstrained fashion for all types of cognition, induction works 'autonomously' on linguistic (i.e. phonological and morphosyntactic) representations and is limited to building structure within the constraints of the principles determined by the appropriate level of representation (module). In this way, induction-based explanations are rendered compatible with a UG perspective on L1 and L2 acquisition and to distinguish it from general induction, Carroll calls this domain-specific version *i-learning*.

Carroll (2001, p. 131) describes *i-learning* as "the novel encoding of information in a representation". This novel encoding is triggered when parsing cannot analyse current input with the existing parsing procedures. Taking as an example the article system again, when encountering a sequence like 'the English teacher', when the parser has processed 'the' (a determiner, or Det) and arrives at 'English' which is actually an adjective, the current state of that parser might instead favour triggering N(oun) after Det. Since there are in fact other possibilities in English, an native-like parser or one in a more advanced state would of course allow Det N, Det Adj, and Det Adv. On encountering the next word 'teacher', it may register an inconsistency. It is assumed there will be feedback, that is, cues in the input from other levels (phonological, conceptual) that will lead to the construction of parsing procedures, which permits the selection of one of three above-mentioned possibilities following the processing of Det. At intermediate stages of acquisition, however, these possible analyses for the novel form should compete until such time as N is not automatically favoured to follow Det (Carroll 2001, p. 136). In checking for consistency between the input into, respectively, phonology, syntax and conceptual structure with the current state, Carroll's autonomous induction system may identify differences which then trigger one or more operations aimed at reducing the inconsistency. Initially, L2 input will be mapped on L1-based representations wherever possible. New representations will compete with the old ones until their strength is established via further exposure to the language. This may

sound not unlike O'Grady's account. One crucial difference, however, are the constraints imposed on the way the operations responsible for reducing inconsistency can work. Also Carroll's system works on the basis of identifying failure whereas O'Grady is simply working on a principle of efficiency.

6 The Modular On-line Growth and Use of Language Framework (MOGUL)

Parsimony was mentioned as an attractive quality for an explanation of language acquisition. O'Grady's approach scores highest in this regard but this crucially depends on the question of whether a domain-specific analysis of human linguistic ability and its development in the individual can be discarded. The question now arises whether a Jackendoff-based approach has to also assume a language acquisition device of the kind that Carroll proposes. The component of the MOGUL framework that is based on Jackendoff but which nonetheless supplies a different answer to this question is Acquisition by Processing Theory (APT), where acquisition is characterised as *the lingering effect of processing* (Truscott and Smith 2004). APT, like O'Grady's emergentist model, rejects the need for any separate developmental mechanism (such as i-learning). Hence, it is not 'failure-driven' in the sense of parsing failure triggering 'repair'. Transition is accounted for by the operations of the parsers to build strings of representations on the basis of the best overall fit for the current input. There is no (re)construction of parsing procedures within a separate induction-based LAD as described in Carroll's account of i-learning. Rather, growth is the outcome of the parsers' continuing attempts to find the best overall fit for input: items that are ultimately selected in response to given input will, as a result, gain in strength and acquire an improved chance of being selected in future. The parser, as it were, does not understand failure so there is nothing to trigger repair operations. Looking at the operations of the parser as outside observers, we can say that there is something that amounts to a response to parsing failure and subsequent repair but we cannot impute this sense of failure to the internal workings of the parser itself. Hence, MOGUL has a less parsimonious explanation of acquisition than O'Grady's in that MOGUL assumes constraints imposed by a language-specific mental system. At the same time, it is more parsimonious than Carroll's AIT approach in that it does without a special acquisition device.

7 Interfaces Again

Returning to the question of interfaces, how do these three models of real-time acquisition view the issue of areas that constitute areas of special learning difficulty? As mentioned earlier, it is difficult to see how the notion of interface (in the present sense of the term) has any real status in emergentist models since there is

no language module at the centre of the language system now in the broadest sense of the term 'language'—to interface with. At the same time, an efficiency-driven parser is not going to develop new routines readily if there are no detectable consequences for interpreting utterances incorrectly, i.e. in a non-native manner. The cues that should indicate to the learner (or, more properly, the learner's acquisition mechanisms) the particular use of a definite article or the obligatory suppliance of a subject pronoun in a language where omission of pronouns is possible in some contexts but absolutely not in others, may be sometimes very subtle and often undetectable. Also, the learner has strongly established L1 routines that can be relied on for the time being, although systems that are not instantiated in the L1 will not be catered for. Adjusting the computational routines to achieve a more native-like state will therefore take a long time or simply not happen. If there is no prior language system in place perhaps the detection of subtle cues is more efficient so for the L2 learners the very fact of a pre-existing L1 system might disguise the cues needed to devise new operations to appropriately select determiners or subject pronouns according to the semantic or pragmatic context. In this way, emergentists might regard the positing of interfaces quite unnecessary, not only because they do not believe in a language module of any kind anyway but also because the observed difficulties that learners do experience can be attributed to the existence of strong L1 routines and the too subtle nature of the cues that ought to trigger appropriate changes in the learner's semantic and pragmatic knowledge of the L2 system. The obvious solution that some might offer at this point is that the learner might be given explicit information in the form of rules to compensate for semantic or pragmatic complexity of the evidence in the language itself. The effectiveness of explicit knowledge building on the way the learner processes and interprets L2 utterances is an important and contentious subject in its own right. At this juncture, it is appropriate only to say that the topic is still highly controversial (Sharwood Smith 2004; Truscott and Sharwood Smith forthcoming).

As regards the two other approaches, based on Jackendoff, and which therefore assume the existence of an inner core language system, the notion of interface is interpreted in frameworks that are trying to explain real-time development. Ironically, the whole debate about interfaces has been carried out in the context of a classical generative framework which has few pretensions about solving real-time development issues apart from locating and describing the problem in terms of linguistic theory. To advance beyond a definition of the boundaries (interfaces) where problems arise and relating to this to the debate about whether a second language learners UG is intact or not, no further coherence can be achieved in such explanations precisely because the psycholinguistic real-time element is missed out. This is the contribution of approaches such as Carroll's and MOGUL. If you are convinced that an emergentist approach is always going to fall short of a full explanation of these issues, then the right choice still has to be to incorporate a real-time processing framework into your account. In other words, we need to know in psycholinguistic terms why on-line processing operations that were able to reconstruct a full native-like language system in childhood seem to fail at the points defined by the interfaces. There are many questions remaining but they cannot be answered by ignoring acquisition as real-time processing.

References

- Bley-Vroman, R. 1990. The logical problem of foreign language learning. *Linguistic Analysis* 20: 3-49.
- Bley-Vroman, R. 2009. The evolving context of the Fundamental Difference Hypothesis. *Studies in Second Language Acquisition* 31: 175-198.
- Brown, R. 1973. *A first language*. Cambridge, MA: Harvard University Press.
- Carroll, S. 2001. *Input and evidence: The raw material of second language acquisition*. Amsterdam: John Benjamins.
- Carroll, S. 2007. Autonomous Induction Theory. In *Theories in second language acquisition*, eds. B. VanPatten and J. Williams, 155-174. London: Routledge.
- Chomsky, N. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Culicover, P. and R. Jackendoff. 2005. *Simpler syntax*. Oxford: Oxford University Press.
- Dulay, H. C. and M. K. Burt. 1974. Natural sequences in child second language acquisition. *Language Learning* 24: 37-53.
- Goad, H and L. White. 2008. Prosodic structure and the representation of L2 functional morphology: A nativist approach *Lingua* 118: 577-594.
- Hauser, M., N. Chomsky and W. T. Fitch. 2002. The language faculty: What is it, who has it, and how did it evolve? *Science* 298: 1569-1579.
- Holland, J. H., K. J. Holyoak, R. E. Nisbett and P. R. Thagard. 1986. *Induction: Processes of inference, learning and discovery*. Cambridge, MA: MIT Press.
- Jackendoff, R. 1987. *Consciousness and the computational mind*. Cambridge, MA: MIT Press.
- Jackendoff, R. 2002. *Foundations of language: Brain, meaning, grammar, evolution*. Oxford: Oxford University Press.
- O'Grady, W. 2005. *Syntactic carpentry: An emergentist approach to syntax*. Mahwah, NJ: Lawrence Erlbaum.
- O'Grady, W. 2008. The emergentist program. *Lingua* 118: 447-64.
- Pinker, S. and R. Jackendoff. 2005. The faculty of language: What's special about it? *Cognition* 95: 201-236.
- Krashen, S. D. 1985. *The input hypothesis: Issues and implications*. New York, Longman.
- Schwartz, B. D. 1999. The second language instinct in language acquisition: Knowledge, representation and processing, eds. A. Sorace, C. Heycock and R. Shillcock, 133-160. Dordrecht: Elsevier.
- Sharwood Smith, M. 2004. In two minds about grammar: On the interaction of linguistic and metalinguistic knowledge in performance. *Transactions of the Philological Society* 102: 255-280.
- Selinker, L. 1972. Interlanguage. *IRAL* 10: 209-231.
- Sorace, A. 2011. Pinning down the concept of 'interface' in bilingualism. *Linguistic Approaches to Bilingualism* 1: 1-33.
- Truscott, J. and M. Sharwood Smith. 2004. Acquisition by processing: A modular perspective on language development. *Bilingualism: Language and Cognition* 7: 1-20.
- Truscott, J. and M. Sharwood Smith, forthcoming. Input, intake, and consciousness: The quest for a theoretical foundation. *Studies in Second Language Acquisition*.
- Wexler, K. and P. Culicover. 1980. *Formal principles of language acquisition*. Cambridge, MA: MIT Press.
- White, L. 2003. *Second language acquisition and Universal Grammar*. New York: Cambridge University Press.
- Zyzik, E. 2009. The role of input revisited: Nativist versus usage-based models. *L2 Journal* 1: 42-61.

Psycholinguistic and Sociolinguistic Perspectives on
Second Language Learning and Teaching

Studies in Honor of Waldemar Marton

Drozdziel-Szelest, K.; Pawlak, M. (Eds.)

2013, X, 250 p., Hardcover

ISBN: 978-3-642-23546-7