Linguistic structure with processing in second language research: is a ‘unified theory’ possible?
Larry Selinker, Dae-Eun Kim and Shoba Bandi-Rao
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We investigate a unique attempt at working out a unified theory of second language acquisition (SLA), Carroll’s ‘Autonomous Induction Theory’. This theory integrates SLA traditions that often ignore each other and adds a learning theory where novel information gets created to resolve learning problems. Cognitive universals, modularity theory, universal grammar, inductive learning, initiation of learning, working and long-term memory, top-down and bottom-up processing, input, errors, correction and feedback, language transfer, fossilization, restructuring of interlanguage are amongst the concepts reviewed. This project thus spans multiple domains but leaves many unresolved issues. However, since these issues appear in one framework, we have found that altogether, it provides excellent discussion material for advanced students. Finally, we suggest some ways in which the burden of the denseness of the material might be lightened.


1For space demands, a word on our referencing: unreferenced pages are from Carroll (2001); her other relevant works are in the References there. Jackendoff appears throughout; see Carroll for citations. We use the locution ‘feedback/correction’ to cover the categories ‘feedback and correction and metalinguistic information’ and sometimes ‘metalinguistic instruction’.

Address for correspondence: Larry Selinker, Department of Teaching and Learning, New York University, 635 East Building, 239 Greene Street, New York, NY 10003-6680, USA; email: larry.selinker@nyu.edu


I Introduction

Can we create a unified theory of second language acquisition (SLA) where linguistic structure with all its richness and complexity is seriously integrated into concerns of how people process input? Can we have language as well as acquisition mediated by processing? What about the inclusion of first language acquisition in our unified theory? It may be difficult to hold all this in a unified conceptual space, especially if we wish to imply a parallelism between first and second after their exhaustive dissection in Foster-Cohen (2001: 330):

> It is frequently assumed that ‘first-language acquisition’ and ‘second language acquisition’ must be directly comparable. The parallelism of the two expressions, which appear only to be distinguished numerically, encourages it. But, are any of the composite terms . . . the same across the two expressions ‘first-language acquisition’ and ‘second-language acquisition’?

These are problems that Carroll has confronted for years; her ambitions underlying this are primarily to design a theory of SLA by ourselves for ourselves. That is, according to Carroll, we should not ‘expect somebody else (e.g., psychology, even less so theoretical linguistics)’ to design one for us (Carroll, personal communication). In a series of articles and in an intimidating book, Carroll presents the results of her wide-ranging inquiry. The material is dense for a number of reasons: first, most of the L1 and L2 studies Carroll cites do not have details for the reader to follow her position. She packs in a lot of information on each page with references to a large number of studies. Secondly, Carroll does not provide a glossary to make things easy, so the reader is likely to have some trouble understanding her specific use of technical terms. Thirdly, to understand the book, the reader needs to have a rather complex background including psycholinguistic knowledge (e.g., modularity, induction, etc.), a Chomskyan theoretical linguistic knowledge of syntax (CP, COMP, SpecCP, C-command, V2 ordering, etc.), morphology and phonetics, especially an understanding of what she implies with phonetics and the stream of speech being processed.
into words. Thus, without examples in many places, it is a struggle if one is not proficient with the literature on psycholinguistics, first and second language acquisition, and theoretical linguistics. In a way, this is what is needed for the field: an understanding of SLA from various facets in order to get a more comprehensive picture. Carroll is, after all, trying to unite structure and processing. More on each of these points passim below.

Her most accessible material are the data-oriented early articles (Carroll and Swain, 1991; 1993; Carroll et al., 1992) co-authored at the Ontario Institute for Studies in Education. We need to find a way to penetrate what she has accomplished since then and the place of the earlier empirical work in the total. The abstract to her plenary (2002) states the essential outcome of this project:

the Autonomous Induction Theory, a theory of learning which is compatible with the hypothesis that Universal Grammar constrains the nature of natural languages. Based on Jackendoff's architecture of the language faculty and Representational Modularity Hypothesis, it defines a trigger for the acquisition mechanisms and states a number of formal and psycholinguistic constraints on how they can operate.

As noted, Carroll has special meanings/connotations for technical terms with vertiginous shifts of landscape, without always calling attention to what she is doing. For example, evaluating her use of the term ‘error’, we find prominently the term ‘detectable error’ (p. 169) which is definable over linear sequences in terms of ‘closeness of fit’ between input to parsers (analyses of stimuli) and currently activated representations. If learners can parse and interpret speech signals, no detectable errors are registered by parsers, although learners ‘may still be making systematic errors in production’. To complicate matters, we find a confusing analogy between speech-writing errors and accent errors with little empirical research to support the idea that learners make speech-writing errors while simultaneously recognizing those errors. She may differentiate in places between detectable errors and various other types of error, but Carroll does not analyse their relationships, nor integrate them into the whole. It is frustrating and we become onomasiologically-challenged: we discuss this problem in a few strategic cases below such as footnote 6, passim for Universal Grammar (UG).

Terminology aside, we have to ask if Carroll’s way is the right way to proceed towards a unified theory. Answers are not clear. Carroll’s work (2001; 2002, as well as other late-1990s articles) is an attempt to create one framework for two major traditions of SLA. The first tradition sees, at the SLA core, linguistic structure, both universal and language particular. The second tradition sees, at the
SLA core, cognitive processing/mechanisms, including memory. These traditions often ignore each other. Given Carroll’s wide ambitions and the difficult material and dense presentation, we first wish to summarize the main points of this project. Then we look at issues raised in Carroll, both explicitly and implicitly.

II Carroll’s work: what it presents

Carroll (2001) assumes:

throughout that language is mentally represented in terms of structures, and that constructing a model of language processing and language processors involves being explicit about structures that are being built, and modified. (p. 12)

Carroll presents overlapping objectives which we reformulate:

1) logical relationships between input\(^3\) and ultimate linguistic competence;
2) roles and functions of feedback/correction;
3) relationship of (1–2) to UG in SLA;\(^4\)
4) learning an L2 within a theory of speech processing and speech production;
5) limited but causal roles of UG in initiating SLA and in determining the nature of its development (vs. feedback/correction) (pp. 1–2).

Objective 5 is different from the others: its limit is specific kinds of acquisition problems and periods of development since feedback and correction cannot be ‘major explanatory mechanisms’ in a unified theory. A sixth broad objective is buried on p. 58:

6) psycholinguistic precision of the exact relationship between grammatical theory, psychograms, functional architecture of the language faculty, and the data set. This is a huge goal, in and of itself.

Carroll is obviously right that we must empirically discover more about:

\(^2\)We also have neuropsychology/biology approaches (not appearing as such here) and sociolinguistic approaches, which also does not appear here as a separate entity. Social factors, where they appear, are interpreted through the medium of cognitive representation, a not unusual approach.

\(^3\)Not everyone’s definition: the language that L2 learners ‘hear and interpret’ (pp. 1–2).

\(^4\)An attempt to constrain SLA theory to ‘what is logically possible and empirically observable’.
• the particulars of grammatical representations of speech that learners hear or read, and from this input infer a meaning;
• the kinds of exposure learners need;
• the kinds of exposure learners actually get;
• the abilities learners need to perceive and extract words from speech signals;
• the problems of the initial state;
• how learners leave the initial state once they can perceive and encode words; and
• how learners construct grammatical representations at various stages.

Carroll provides detailed lists of why we need each item (pp. 3–6). Like others (for overview, see White, 2003), Carroll sees explanatory theory in SLA including different but related subtheories:

1) a ‘property theory’, i.e., a theory of linguistic knowledge (mental grammars);
2) a ‘transition theory’, i.e., a theory of knowledge restructuring (how mental grammars can/cannot change).

Carroll argues that two different but related subtheories must be integrated into these:

3) a processing theory, i.e., how input enters the system from the speech signal (bottom-up) or from the conceptual system (top-down); and
4) a learning theory, i.e., how novel information gets created to resolve learning problems. (p. 39)

Integrating all four is one of the major tasks she takes upon herself. Carroll carefully examines two alternative theories: Principles and Parameters (P&P) and the Competition Model. She discusses at some length how UG (P&P in particular) fails to capture at least three types of knowledge:

1) irregular variation, some which is variety-specific and yet still must be covered by acquisition theory;
2) idiosyncratic knowledge, linguistic knowledge that varies from speaker to speaker; and
3) sociolinguistic variation, where within a given language community, variation in language use frequently reveals a shared pattern explainable in terms of both social context and social symbolism. (pp. 40-41)

The bottom line is that UG cannot accommodate these kinds of variation for either L1 or L2 speakers, thus failing to unite first and
second language acquisition. Next, follow similar attacks on the Competition Model, which she views as a transition theory lacking in the explanatory nature for accommodating linguistic knowledge. Going into detail here would take us too far afield.

The specific details of Carroll’s ‘Autonomous Induction Theory’ (AIT) are presented in many dense pages (pp. 119ff.), and the text takes much careful decoding. AIT is selectively built upon Jackendoff’s Representational Modularity (RM) in which cognitive universals play a fundamental role in explaining what we know about language and how we come to know it. Each faculty of mind has its own chain of levels of representation (lowest to highest); chains intersect at various points; structural levels at chain intersections are responsible for interactions among faculties; and central levels where thought takes place are ‘largely independent’ of sense modality, at the intersection of many distinct chains. For Jackendoff, the language faculty consists of auditory input, motor output to vocal tract, phonetic, phonological, syntactic components and conceptual structure, and correspondence rules, various processors linking/regulating one autonomous representational type to another. These processors, domain specific modules, all function automatically and unconsciously, with the levels of modularity forming a structural hierarchy representationally mediated in both top-down and bottom-up trajectories. Inductive learning involves implicit and explicit learning; Carroll assumes that ‘deployment of negative evidence may require awareness’. If this is so, it imposes a new formal awareness constraint on negative evidence inside modules (pp. 127–28), assuming we know what modules are.

UG here is merely one type of necessary cognitive universal which may not be central for all of core grammar (p. 50). Not all conceptual information can be derived from phonological and morphosyntactic systems because these cannot encode everything representable in our conceptual systems. According to AIT, and Carroll’s interpretation of large amounts of empirical data, conceptual representations can be formed through feedback/correction, which in turn can bring about grammatical restructuring. But the reader should notice that she emphasizes that feedback/correction has limitations in initiating restructuring (more below). AIT puts some emphasis on universals while, at the same

5Carroll strikingly states generalizations in possibility modality with phrases throughout such as: ‘can cause restructuring’, ‘can cause (learners) to reanalyse stimuli’, ‘can lead to encoding’, ‘can learn generalizations’, ‘might arise on a strictly biological basis’. Such prudent statements lead to plausible but weaker claims that might not be falsifiable.
time, giving important roles to induction in explaining L2 development. She argues against the classical either/or positions of total access to UG, especially when comparing first vs. second language acquisition. She believes that these debates are ‘wrong-headed’ in principle (p. 54). Neither group of learners is ‘accessing’ UG in the sense that they are activating stored information in a UG-black box. Specifically for SLA, innateness arguments do not provide sound explanation.

Besides RM, Induction Theory is another crucial component of AIT (pp. 119ff.), albeit again adapted selectively. Induction learning (‘i-learning’) has as a basic property, some components ‘operating autonomously within the theory of modularity’. Classical induction theory claims that feedback, without which problem-solving would not be possible, serves key roles, guiding learners from one mental state to another. But this is limited in that ‘it locates all induction, and therefore all categorization, in the conceptual representational system’. Cognitive processes amount to inductive processes where novel encoding of information is involved in a representational system. (pp. 130–31). Carroll sees problems with these models, but adopts the notion of ‘competition’ (here in a very particular sense), whereby analysing a novel form involves competition among various information sources from different levels. Carroll does offer some examples: one concerns i-learning based on metalinguistic instruction with respect to a grammatical phenomenon; another involves bottom-up i-learning of the same phenomenon. Carroll (2001) is particularly dense here with few examples and the casual reader will give up, but this is but where extensive detail of AIT is sketched and where the model will rise or fall in its empirical correctness.

At last (p. 170), Carroll defines what she means by induction, which is a process leading to ‘revision of representations so that they are consistent with information currently represented in

\[6\ldots\text{UG is simply not encoded in longterm memory and thus cannot be accessed by learners. Accessing metaphors misrepresent the hypothesis that UG is innate (pp. 68,108). L2 learners do not have available a full range of universal distinctions when they begin learning gradually becoming ‘sensitized’ to just those in L2 input (p. 110).}\]

\[7\text{To sample denseness: metalinguistic i-learning involves ‘no possible correspondence between a unit of the conceptual level and a nonexistent unit of the lexicon or of the morpho-syntactic level’ whereas the bottom-up process engages a ripple effect of activated rules and a cluster of grammatical results (pp. 154–55). Carroll takes empirical SLA results where L2 learners frequently assume every word in L1 has a lexeme in L2 and are often surprised at ‘lexical gaps’ in L2, arguing for plausibility of cognition principles where semantic entities constitute default representational contexts for inferencing and problem-solving. This has an impact on SLA, suggesting some mechanism(s) that must inhibit the influence of L1 mental models, in this case schemas, noting that schemas lack syntax (p. 138).}\]
working memory’. This is rendered as initiating and terminating processes for i-learning; concerns of initiating are very developed in AIT. I-learning begins with the failure of current representations to fit active mental models in conjunction with specific environmental stimuli or some other computation (p. 168). It ends when the parsing system (not the production system) fails to detect such discrepancy. Two important points are: ‘induction is dependent on the physical properties of the speech situation only indirectly’, which relates to another crucial point: how we get to ‘fossilization’. It is claimed here – in disappointedly brief outline form and with no longitudinal evidence presented – that fossilization occurs ‘when the organism fails to detect errors’ in the sense described above (p. 169).

The three final chapters form a unit where we are presented with specific details of one aspect of AIT: SLA feedback/correction. Surprisingly for the end portions of this book, it becomes a relatively easy read, much of the evidence coming from nontechnical studies or even anecdotal diary data. (Some readers may wish to continue here after Chapter 1 before returning to the technical material.) Carroll wishes to show empirically why SLA must have a theory with both types of processing (bottom-up and reverse) alongside feedback/correction. For us to evaluate her take on the empirical literature, we must note that she concludes that in every case with every question posed by every researcher cited, the ‘results are very mixed’. This should be important not only for SLA researchers but for others as well, since she is concerned with matters that are central for practising language teachers, e.g., whether learners can learn abstract linguistic relations and properties from feedback/correction (pp. 289–90) or the place of conversation and grammatical instruction in SLA.

Carroll asks what the empirical studies really show. She concludes that one empirical result is that only some types of linguistic properties can be acquired from feedback/correction. That is, the empirical results show that there is a variable effect. To support variable effects of feedback/correction, she considers indirect negative evidence (pp. 290ff.), critiquing widely believed claims that the structure of conversation affects grammatical learning. Concerning the well-known ‘Interaction Hypothesis’, viz. where interaction enriches input to learning mechanisms, Carroll claims reasonably that to evaluate this literature, we need ‘to know how it could do this’ (p. 291; emphasis in the original). She concludes that this hypothesis does not address that question. Succinctly, her argument against this hypothesis is that it is cognitively ‘highly impossible’ because restructuring would have to be matched ‘at the
relevant level of analysis’ (pp. 293 and 291). The claim is that
parsers cannot compute a parse of the stimulus, the central meaning
derived being derived via inferencing. The information stored in the
conceptual system must then be able to influence the parsers (p.
290). The majority of studies reviewed examine the effects of
feedback on speech production only, ‘despite the supposed focus on
comprehension and parsing’ (p. 292).

One issue of contention is that one can learn grammar on the
basis of the negotiation-of-meaning, as many claim. Learners,
according to Carroll ‘can compare a representation of (their) speech
(an acoustic/phonetic representation) to the intake as I have
defined it (an analog representation of the speech signal)’ (p. 292).
With this interpretation (with ‘intake’ having a special meaning),
Carroll concludes that for feedback/correction to restructure
mental grammar, learners must know the relevant level that needs
to be restructured. This must mean that learners are ‘able to
construct a representation at the relevant level’ (p. 292). Carroll
concludes that it is ‘highly implausible’ that learners can do this,
presenting a long-term memory explanation. Although she claims
that studies do show that negotiation-of-meaning helps learners
make more precise lexical choices, she seems sure that they do not
demonstrate the central learning problem of restructuring
interlanguage grammars, since again the empirical results are
mixed. Similar mixed empirical results are said to hold with
grammatical metalinguistic instruction, and explicit negative
evidence, particularly in cases of ‘parameter resetting’, where
there may be some restructuring of the mental grammar (pp.
294–99). But such restructuring may not be maintained in the
interlanguage, which again brings up the issue of existence vs.
persistence as fossilization, of which more below (see also Lardiere,
in press).

Her interpretation of the findings of studies involving the roles
of different kinds of feedback for learners who have grammatical
models introduced at the moment of instruction are that these
learners ‘may have formed only weak representations of the correct
forms’ (p. 314). Her own early studies (Carroll and Swain, 1991;
1993; Carroll et al., 1992) are presented in detail (pp. 321–40). In
brief, she concludes that when different groups are given different
feedback treatments, one finds:

8Processing studies that explore how ‘the nature of forms of instruction . . . can alter learners’
knowledge’, designed to show how stimuli are perceived, establish that SLA takes place ‘on
the basis of the parsing of stimuli’ (pp. 305–09).
‘a learning effect for the feedback items’; and
the learning effects ‘are variable according to the type of feedback given’ (p. 337).

Thus, feedback/correction, metalinguistic instruction (though not all negative) can affect the restructuring of interlanguage, again working in a variable way.9

Consistently using possibility modality in her writing (‘can’, ‘might’; see footnote 5 above), Carroll asks: Can feedback/correction lead learners ‘to detect the fact that an error has been made?’ How might feedback/correction help learners ‘locate errors’?, questions again as important practically as they are theoretically. Carroll addresses and analyses many variables: focused attention, detectable errors, error location, ‘the blame assignment problem’... where categorization, i-learning, and feedback/correction fit (pp. 348ff.). Again she reports that empirical results are mixed. She presents empirical detail from her own studies, e.g., ‘the double object construction’ (Carroll and Swain, 1991; 1993). Studying metalinguistic feedback and other forms of negative evidence, she at last enlightens us as to how utterances can count as feedback/correction: ‘only if a learner is willing to construe some bit of language as expressing a corrective intention on the part of some speaker...’ since ‘no utterance is intrinsically corrective in nature’ (p. 348). This is central to everything conceived here and Carroll raises more hard questions, e.g., How do linguistic processors ‘infer from corrective stimuli’ new structural information?10

In order to restructure mental grammars, learners then must know what the relevant level is that needs to be restructured. This error location is crucial. For evidence, she analyses sentences from

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9Structural transfer (as opposed to processing transfer) appears in discussions of these studies (p. 315) and in discussion of her Toronto studies. One set shows a ‘category conversion’, noun formation from verb stems (p. 322) or reverse. Specificity is important: take the learning of help → helping; this seems clear (just add -ing). But other examples show complexity of this conversion-based meaning of the verb stem; process semantics of -ing suffix; semantics of noun complements (sing → song/*singing); interaction with phonology; conversion rules represented at different levels; and the conversion N → V or V → N. Two possible explanations are provided to explain ‘ease with which learners grasp this categorical distinction’: transfer of categorical properties from native Spanish to interlanguage-English (p. 323) vs. compatibility with UG, where UG ‘excludes’ a particular morphosyntactic possibility, that ‘the correct explanation’ which shows that ‘induction must “respect” the properties of UG’ (pp. 322–24).

10She assumes this requires attention. Borrowing from Jackendoff, working memory has a ‘selection function’ that discriminates amongst competing multiple sets of representations, the most coherent or salient, forcing ‘attention as more detailed processing at a particular level of analysis’, thus building more richly specified structures’ (p. 349). One function of feedback/correction for Carroll then is shifting attention from conceptual processing to linguistic form; in this way, ‘attention leads to more detailed processing of an input’ (p. 349).
an unreferenced ‘corpus of spontaneously provided instances of correction and feedback’, which turns out to be a diary study (personal communication). She does a discourse analysis of snippets of spontaneous conversation generalizing to how learners of a language in this discourse are trying to communicate about the nonlinguistic world while ‘the corrector is trying to communicate’ about learner utterances (p. 355). This disjunction is not new, but it seems that there is a ‘blame assignment problem’, meaning deciding the rule ‘to single out for change or abandonment’. This has to be accomplished by localizing errors, in turn defined as ‘the point of interruption of the on-going discourse’ (p. 355). The claims here are difficult to unpack (let alone test) but the main thrust leads back to the idea that learners have to somehow know exactly what the feedback/correction applies to, comparing output – at the right level – to that knowledge exactly (p. 292).

She addresses the central problem of when second language learning begins. Indirectness in knowing what feedback/correction applies to occurs because learners need to make intended inferences. Since learning begins when differences between input to be encoded and what the system can currently analyse occurs, error plays a crucial role. Learning begins when systems detect error, but error in the special sense of unanalysable input or system discrepancies. This leads to the interesting ‘Detectable Error Hypothesis’. When learners attempt to parse speech, not merely constructing representations, the system checks ‘good fit’ of the computed representations against input. This leads to two types of detectable errors: those related to input stimuli and those related to learner speech production, i.e., the speech production part of the hypothesis (pp. 350–52). We should have evidence that detectable errors in speech production are needed by learners for inducement to re-encode production. More hypotheses follow that might be testable.

At this point Carroll presents the clearest operational definition of feedback: ‘a form of interruption [which] defines a mental space to which learner attention can be drawn and within which additional processing can occur’ (p. 356). Detected errors can arise from multiple causes. Thus, theory must begin to define clearly how feedback/correction helps learners to locate learning problems (p. 356), especially in terms of categorization (p. 363).

Utterances count as feedback/correction only if learners are ‘willing to construe some bit of language as expressing a corrective intention on the part of the speaker’ (p. 371). Carroll invokes the cognitive area of memory, that, to our knowledge, has not been
made central to any theory of SLA that includes the complexity of linguistic structure. In AIT, there is a central place for memory: Working memory can contain multiple sets of representations, which arise during the processing of stimuli when there are ‘indeterminancies’ in the analysis of the input.¹¹ A distinction is made between what beginners vs. advanced learners are likely to know or not know regarding feedback/correction (p. 372). Beginners do not know enough of the L2 to interpret feedback/correction offered in the L2. Advanced learners are likely to know ‘the information the corrector is attempting to transmit’ (p. 390). This leaves a studyable period ‘in-between where feedback and correction can, in principle, play a role in explaining grammatical restructuring’ (p. 372).

Carroll is at the edge of her research here with many unresolved issues. We now move to some.

III Sketch of unresolved issues

We briefly look at some prominent issues raised by Carroll both explicitly and implicitly. The first issue is that of language transfer, i.e., what is transfer and its place in the AIT? Carroll mostly assumes transfer throughout, claiming that there exists a ‘widely accepted hypothesis that adults transfer knowledge of the L1 grammar to the tasks of parsing and producing the L2’ (pp. 54 and 82). But, we know of no ‘widely accepted hypothesis’ that adults transfer knowledge of the L1 grammar to parsing. If L2 learning relates to what is called error in the system, it is hard to understand what is going on in L2 learners’ perception if they parse any L2 string in terms of transfer. Again, Carroll presents a particular buried meaning/connotation: ‘Transfer is just the name we give to the fact that L2 speech is encoded in terms of the same categories and patterns of the L1’ (p. 54). Well, it isn’t because (see footnote 10) we not only have structural transfer that can work with category conversion, but also processing transfer whose function never gets clear. Transfer can control levels since it follows from one of her constraints that:

transfer must involve identification at the right level. It is simply not possible for a learner to identify a category of the syntax, e.g., the syntactic phrase, as if it were the same thing as an instance of segmental encoding. (p. 200)

This claim is not tenable since we think empirical evidence going back to Weinreich (1953), if not earlier, contradicts this as a general transfer principle since it has been long known that it is indeed

¹¹There is reference here to Jackendoff, working memory containing a ‘selection function’, a key factor making ‘linguistic feedback usable’ (p. 390).
possible to have feature X at one level in one language (e.g., phonemic) transferred to another level in another language (e.g., allophonic).  

Carroll uses transfer existence as providing strong **prima facie** argument for the hypothesis that interlanguage knowledge must be encoded in the same ‘languages of the mind’ as those used to encode the L1 (p. 55), a metaphor denying in principle even slightly different encoding systems for L1/L2. This is an ontological claim with little supporting evidence phrased in hedged language. Without the modularity system, language processing with structure will not stand, unconstrained i-learning will result in rogue grammars. In RM, the language faculty has several autonomous representational systems where particular types of representation can be modular (p. 121). Unfortunately, modularity appears throughout her work without definition, a serious weakness. She holds to classical structural theories of information processing; input is defined as mental representation with structure positing psychological reality connected to structures of the learner’s cognition (p. 12). Carroll has to assume that modularity is representational given that Jackendoff’s Representational Modularity is so essential in her AIT. The problem is that regarding this essential notion (as well as so many others) she seems to assume that the reader already has a basic knowledge of modularity, but the fact is that the term is used widely as a primitive among psycholinguists as well as linguists, and they may not all have the same notion in mind (for example, see discussion here on Fodor, passim). The reader new to these notions – or even experienced colleagues wishing to refresh their memories – might want to check out such readable sources as Crystal (1997: 246) and the references there to note the various ‘slightly different ways’ in which the concept is used. Carroll’s readers should not have the burden of deciding this on their own, although she may simply assume that her introduction of the term on p. 12, and especially her extended discussion of Jackendoff’s RM in Chapter 4, are sufficient. The rationale Carroll adopts for modularity preference seems to be based on her conviction that linguistic knowledge/cognition is structure dependent. Carroll asserts that this structure dependency has been supported by long years of linguistic research, but this research may not apply to SLA in every case; this would have to be shown for each relevant domain.

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12This is exactly the evidence that Weinreich (1953) provides and is the basis of his claim that in creating interlingual identifications, one ‘makes the same what cannot be the same’.

13Transfer appears to require as a logical necessity that the encoding systems of the L1 and the interlanguage be of the same type because transfer is the analysis of a phenomenon X as being an instance of category Y (p. 54).
We find modularity used extensively with no clear definition of ‘module’. What exactly is a module and how many are there? We like the concept but the situation is untenable. Hedging is endemic here. Jackendoff himself uses ‘largely independent’ (see above). Gregg – whom Carroll and others in SLA (at least, partially) depend on – provides a rare recent definition:

A module is a comparatively autonomous subsystem within a larger system, which acts more or less independently of other subsystems, and has structures and functions that are more or less recognizably different from those of other subsystems. (Gregg, 2003a: 839)

The issue is further confused with the recognition here and in (Gregg, 2003b: 97) that ‘Cognitive science recognizes a couple of different senses of modularity’, but it is not always clear which concept proponents are using. Plus, we need to ask how we are to understand the imprecision of the hedges used above (e.g., ‘largely’, ‘comparatively’, ‘more or less’, ‘a couple of’) in a ‘definition’ of such a central concept. This is complicated by the widely, but not universally held view that general problem-solving mechanisms are believed to affect grammar learning and restructuring (Carroll hedges here too) and Carroll says mysteriously that RM proposes that ‘a particular type of representation can be modular’ (p. 121). In addition to have a clearer definitional presentation, empirical evidence is needed for selective modularity in SLA. How UG in SLA could work in practice with input remains open, especially given claims of a universal parsing system.

Although Carroll implies consideration of L1 acquisition in many places related to such issues as the language acquisition device, the language faculty, the initial state, phonetic coding, etc., its exact place in AIT needs to be worked out. The argument revolves around the place of UG in both first and second language acquisition. In both there are strong representations that cannot be accounted for by ‘enriched input’, which leads Carroll to ‘accept UG in some form or other’ (p. 238) to account for the development of representational systems in both. But, what form of UG applies?

More issues remain. AIT includes both bottom-up and top-down processing, but exactly how these two different types of processing (recognized at least since Aristotle) are (inter)related in AIT is never confronted. We have a suggestion since we wonder if they would act in tandem, both reinforcing each other in a multiple effects way, as the Multiple Effects Principle would predict (Selinker and Lakshmanan, 1992). Although Carroll argues well that a unified theory of SLA must have both types of processing plus feedback/correction, we do not find a discussion of what exactly the
place and role of each is in AIT. So the theory is incomplete and this should be carefully noted. More could be investigated here.

Another crucial issue is how detectable errors in this sense relate exactly to the ordinary concept of error, recalling Corder’s (1967) concept of covert error? The issue of volition is central since it is not what learners will do, but what learners can do that matters here. We need to know how important cognitive indirectness is, where learners somehow must know exactly what is to be re-structured, what the feedback/correction applies to. The information that some utterance is defective involves learners needing to make intended inferences. There is a chain of unexplained logic here that must involve huge individual differences, and careful discussion is needed.

Much space is spent on the issue of when learning begins but only a few pages on when interlanguage learning ends (except for her sharp attacks on UG ultimate attainment project). Carroll is sure she knows how it works: learning ends when processing systems allow learners:

to arrive at an interpretation of a stimulus [and] when the speaker/learner’s output is compatible with her referenced set or norms, encoded in some mental model of the speech community. (p. 353)

Colleagues working in this area will be annoyed with her for not discussing longitudinal evidence nor literature spanning more than 30 years that debates stabilization/fossilization issues. (Extensive detail can be found in Long, 2003; Han, in press.)

In general, one might question some of Carroll’s empirical evidence, both her own and that presented from the literature, as well conclusions she draws from these. An issue is that the majority of studies, she claims, examines the effects of feedback ‘on speech production only, despite the supposed focus on comprehension and parsing’ (p. 292). This has to be sorted out. The detailed discussion of the earlier mentioned Toronto empirical studies she depends on (Carroll and Swain, 1991; 1993; Carroll et al., 1992) creates claims involving equally mixed results of sometimes significant, sometimes nonsignificant (pp. 316ff.). Given that explicit teaching input is often involved with these studies, the sorting out and practical implications of such input vs. representational input eventually need to be addressed for this work to have its full impact.

A validity issue of mixed data arises in that data reported are of different conceptual types. Some are experimental – e.g., parsing and the beginning of learning – and some (although this is not always clear) have the status of: ‘I wrote them down with article and pencil in diary fashion’ (Carroll, personal communication), e.g.,
much of feedback/correction. To claim cognitive validity, the theoretical status of mixed data and mixed results must be confronted. These issues again are important to practising language teachers, especially the belief that learners can learn essential elements of abstract linguistic relations and properties from feedback correction (pp. 289–90). If it is possible to learn grammar on the basis of conversation and negotiation of meaning, this must mean that the learner ‘can compare a representation of his speech (an acoustic/phonetic representation) to the intake as I have defined it (an analog representation of the speech signal)’ (p. 292). One wonders if proponents of these concepts would accept her characterization, the essentials of the argument that feedback/correction are not necessary to restructure mental inter-language grammars. In any case, we should make clear to teachers what the results are, that with feedback/correction some types of linguistic properties can be acquired, but not necessarily any other property of grammar. That is, although feedback/correction play a role in the acquisition of linguistic knowledge, they will not work equally on all linguistic properties and with all individuals. This variable cognitive result should become more widely known. Individual characteristics would have to be important here; the variable application of principles does not have to be the fly in the ointment, but can be the spur to decades of practical and theoretical research.

IV Conclusions

This body of work, a project that spans multiple domains, has been produced by a careful, thoughtful and critical thinker who is not afraid of hard questions, such as ‘How do the “linguistic processors” infer from corrective stimuli “new structural information”? (p. 349). We wonder if Carroll is dealing with questions of ontology (questions of factual existence) or etiology (questions of basic causes). Etiology seems to drive her, but issues of ontology keep coming up, and that is exactly where the selective borrowing from various fields hinted at above comes in. Even if she does not present us with a unified theory, she may present us with a way to determine how to stop depending on other people’s theories. But, if we selectively borrow, we need a principled way to determine this, and Carroll has made a start.

One thing has become clear: SLA should avoid either – or questions that have plagued us since the beginning of our discipline.

14Lardiere (in press) remarks strongly on this selectivity.
This does go back a long way to at least Lado/Fries setting up an initial stage in the ‘oral approach’ that is clearly distinguished from later stages, to Dulay/Burt attacks on language transfer as playing no role, to UG/no-UG being activated or accessed. We can now remove another either/or question that Carroll handles so well: feedback/correction. The idea that they play no role in developing core grammar should be settled; they play some role. She has put this one to rest through brute force arguments. We are back where we were with language transfer two decades ago: the what, when, how descriptive questions.

Not many readers will slug through to the end of Carroll (2001), and this is a shame. Struggling with this material inspires excellent discussion amongst advanced students. It forces them to ponder primary sources they may not have considered. These students can get very unhappy with their so-called ‘education’, realizing that there’s much in the literature they have not been prepared to understand, and summarizing her work – trying to get her right in her own terms – is a most useful exercise. Another reason to try to summarize these ideas for a general SLA audience is that we agree with Carroll (EUROSLLA plenary, September 2001) that this material should be represented in introductory SLA courses; this is a necessary but difficult task. Where is Carroll going now? We know that she intends to investigate one central problem: how learners ‘perceive and extract “words” from the speech signal’ (CUNY talk, March 2003). This is surely important – it is the unstudied difference, say, between learning Italian and learning to understand Italians – and we wish her well.

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V References


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