

THE ROLE OF LITERACY IN THE DEVELOPMENT OF L2 MORPHO-SYNTAX FROM AN ORGANIC GRAMMAR PERSPECTIVE

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1 Introduction

When it comes to the acquisition of linguistic competence, generative linguistics allows for no involvement of literacy – or indeed anything relating to general cognitive mechanisms rather than to language-specific mechanisms (see Chomsky in Piatelli-Palmerini, 1979). This is the standard view of children’s acquisition of linguistic competence in their first language (L1) and also the position taken by those second language (L2) researchers who argue that language-specific mechanisms drive second language acquisition (L2A) for both children and adults. A basic assumption in this framework is that the human mind is modular (Fodor 1983). The child’s acquisition of linguistic competence – most clearly syntactic competence – is thus achieved without influence of general cognition. Support for this position comes from a number of sources, including from normal children’s acquisition of an elaborate system whose complexity cannot be accounted for by the input alone; this is known as the Logical Problem of Language Acquisition (Hornstein and Lightfoot 1981). Moreover, researchers have not only confirmed that normally developing children under the age of four possess complex syntax that far outstrips their level of cognitive maturity (e.g. Crain 1993), but they have also documented the asymmetric cognitive and linguistic development of children who despite severe cognitive deficits acquire complex syntax and children who despite no cognitive deficits exhibit selective linguistic impairment (see, e.g., Curtiss, 1982; Leonard, 2000; Levy, 2002; Smith and Tsimpli, 1995). These sorts of cases point to a double dissociation of general cognition and language-specific mechanisms which is expected under a modular view of the mind.

Using Fodor’s (1983) criteria for a mental module, Schwartz (1993) describes how the modularity of mind assumption works in adult L2A where language-specific mechanisms continue to operate, where the learner has access to Universal Grammar (UG) throughout the lifespan (see e.g., White, 1989). Schwartz points out that – as with vision (another module assumed to involve specific rather than general mechanisms) – the input relevant to computation of knowledge in a given module is restricted. For the language module, the only relevant input are utterances in the learner’s environment – primary linguistic data (PLD). Instructed second language learners typically develop an additional type of

knowledge. Not located in the language module, this learned linguistic knowledge (LLK; similar to Krashen's 1985 "learning") develops through the use of general cognitive mechanisms in response to the sort of explicit explanation and error correction found in classroom contexts. However, it is notoriously difficult to determine the source of a given L2 learner's utterances. For young children, LLK as a source can be excluded because they have next to none (the meta-linguistic awareness present is basic and not subject to volitional control; see Gombert 1992). For instructed adult learners, the majority of their linguistic behavior – the language they produce – could well be derived from LLK. But as Jordens (1996) observes, just because older learners *can* use general cognitive mechanisms to develop the meta-linguistic skills for production of utterances in an L2, this does not mean this is how adults acquire linguistic competence in a second language.

One body of empirical support for modularity of mind and for Jordens' observation is reviewed by Ellis (1990), who concludes that instruction does not influence learners' route of development. It must therefore be the case that language-specific mechanisms are somehow employed regardless of context. Ellis further concludes that instruction can influence rate and degree of progress on the basis of studies suggesting that classroom learners progress faster and go further than uninstructed learners. Although we do not know why or how instruction influences rate and ultimate attainment but not route, its function is normally assumed to be connected to the effect of meta-linguistic cogitation on language acquisition. Yet it can be argued that the wealth of studies probing the effects of instructional features do not seriously challenge modularity, where the classroom is construed as simply providing more primary linguistic data. Despite a plethora of studies, evidence pointing to the direct influence of learned linguistic knowledge on linguistic competence is hard to come by because studies of instructed L2 learners too rarely consider what Chaudron refers to as "the nature of learners' variable and systematic acquisition" (2001, p. 66) in his review of 80 years of classroom studies in *The Modern Language Journal*.

So let us now consider two (near) facts in second language acquisition. The first is the idea that the learner's L1 has at least some influence on L2 development. We will not pursue this to any extent here, as we do so elsewhere (e.g. Vainikka and Young-Scholten, 1994; 2005). The second is that L2 acquisition involves inter- and intra-learner variation. Both the modularity/UG access in adult L2A position and Ellis' (1990) conclusions on the effect of instruction allow scope for variation with respect to rate and ultimate attainment or end state but *not* with respect to route. Which explanation one entertains here depends on whether one believes that adult L2 learners have continued access to UG or whether one holds the opposing view, that only general cognitive mechanisms are involved

(Bley-Vroman, 1990; Clahsen and Muysken, 1986; DeKeyser, 2000).

Much of the on-going debate between those who see second language acquisition as driven by language-specific mechanisms and those who see it as driven by general cognitive mechanisms revolves around morphology. Morphology is also central in the on-going debate among those who believe all L2 acquisition – regardless of age of initial exposure – is driven by language-specific mechanisms. When it comes to the acquisition of verbal inflectional morphology, for example, we find considerable variation across learners, and it is this variation that fuels the fires of debate. If one holds that general cognitive mechanisms guide post-puberty second language acquisition then there is no reason to exclude involvement of extra-linguistic factors such as literacy in morpho-syntactic development. For those who argue that adult L2 learners have access to UG, as Schwartz' (1993) observation on the provenance of interlanguage oral production hints at, things are less clear.

As suggested above, inter-learner variation can – in theory – exist on three dimensions: route, rate and end state. Where *route* of acquisition varies, we would observe individual learners mastering a given set of grammatical functors in different orders. Early research by Brown (1973) and by de Villiers and de Villiers (1973) on first language acquisition, then by Dulay and Burt (1974) on child second language acquisition and Bailey, Madden and Krashen (1974) on adult second language acquisition suggested common developmental orders for all L1 and all L2 learners of a given language with respect to a set of functional morphemes (including copula *be* and the suffixes *-ed* and third person singular *-s*). While differences seem to exist between L1 and L2 learners, those involved in these studies concluded that no differences exist among individuals within these groups. In second language acquisition, the idea of a common route of development translates into both involvement of the language module and non-involvement of L1 transfer because learners following this common route come from an array of native language backgrounds. Since the mid-1990s, however, the conclusion that the learner's native language is inert during L2 acquisition has been hotly contested. Researchers in one camp claim that second language learners follow a common route of development regardless of age, exposure type, education, background and, to a great extent, native language (Hawkins, 2001; Vainikka and Young-Scholten, e.g., 1994; 2005). Those in the full transfer/full access camp (e.g., Schwartz and Sprouse, 1996) maintain that the learner's native language and language-specific mechanisms exert an influence throughout acquisition regardless of the learner's age, etc. There are additional cross-camp differences pertaining to the status of morphology, as we will shortly see.

As concluded by Ellis (1990), adult L2 inter-learner variation exists for *rate* of development; this is most apparent with respect to inflectional

morphology. Because much of the data considered come from cross-sectional rather than longitudinal studies, rate of development may be expressed as accuracy (of suppliance in obligatory contexts), where developmental order is extrapolated. This is an area in which second language acquisition researchers since the 1970s have been and continue to be extremely vocal. The variation across learners observed for level of attainment at the *end state* of second language acquisition is particularly evident for those whose first exposure to the second language occurred after the onset of puberty. In first language acquisition, variation in rate as well as route could in theory occur, but on the end state dimension, variation in ultimate attainment is by definition a sign of impairment.¹

While a generative linguistic perspective would predict the contrary, the route, the rate and the end state of the acquisition of inflectional morphology by L2 learners might all be subject to influence by factors external to the language module. So let us now ask how we might investigate whether variation in development of inflectional morphology can be accounted for by one particular cognitive factor: literacy.

2 Background

We have so far been referring to variation with respect to inflectional morphology, but we shall expand our focus to include syntax, in keeping with previous research findings, which intimately connect the two. Since the early 1990s we have been involved in a research programme that involves looking at the acquisition of morpho-syntax by adult L2 learners who receive little or no instruction. Reasons for looking at so-called naturalistic learners address the point made by Schwartz (1993) regarding the difficulty in determining the knowledge source of adult L2 learners' production. With a prime objective the delineation of child-adult differences, our focus has been on the development of learners' underlying linguistic competence – or, using Krashen's well-known dichotomy, on their acquisition rather than their learning. In working with adult L2 learners whose opportunities for developing LLK are limited, the learners researchers have typically studied have been immigrants who often arrive in the target language country with little education in their native language.² Data from studies of such second language learners

¹Of course this is an overstatement when viewed from a diachronic perspective; languages change over time. But synchronically speaking – apart from lexical differences, patterns of use and the influence of peers' vs. parents' dialect – it would be an unusual parent who would remark that his or her child didn't succeed in first language acquisition

²A dearth of workers in post-WWII northern Europe led to large-scale recruitment of adults from southern Europe, Turkey and Morocco, and when researchers realised workers were learning the L2 on the job, they were targeted for inclusion in studies such as the cross-sectional Heidelberg Pidgin Projekt, the cross-sectional and longitudinal "ZISA" project,

could illuminate the operation of literacy on language acquisition, and indeed the possibility of a relationship between level of native language education and ultimate attainment is mentioned both by those involved in these studies (Klein and Perdue 1997) and by those commenting on the results of these studies (e.g. VanPatten 1988). However, because the focus was on language acquisition, details of learners' education and information about their reading skills sufficient to enable us to pursue this issue are unavailable.

One might hypothesize that L2 instruction or education or literacy accounts for morphological variation. Because there is no single study that manipulates these variables, we are bound to piece together evidence from separate studies. The data we discuss below come from several of our own studies (where we know the details of the learners) of low-educated adult immigrants learning German, French and English, from educated secondary school exchange students learning German, and from school children learning English. What emerges is a picture of the acquisition of inflectional morphology whose variability as yet defies explanation. Our conclusion will be that literacy indeed plays a key – but likely very complex – role.

3 *The Organic Grammar theory of L2 acquisition*

In the spirit of Brown's and Bailey et al.'s ideas on a common path of first and second language development as demonstrated by learners' oral production of verbal morphology, and based on further ideas from the study of L1 acquisition (e.g., Clahsen, 1991; Clahsen, Eisenbeiss & Vainikka, 1994; Radford, 1990; 1995), we posited that the L2 learner's initial state of development solely involves the basic syntactic relations that obtain between the non-finite verb and its complement as in *drink milk*. This is the syntactic verb phrase, i.e. the VP. Under our theory of Organic Grammar, as the learner develops, s/he "builds up" syntactic structure based on the interaction between the ambient, linguistic input – the primary linguistic data – and language-specific mechanisms (Universal Grammar; Chomsky, 1981). The characteristics of each stage in Table 1 relate to a specific functional projection in the syntactic tree, and each projection includes all lower projections, in hierarchical tree fashion. Thus each successive projection is in a sense more complex than the preceding one. The first functional projection, "FP", is best thought of as a transition from a grammar without any functional syntax. The learner next

the longitudinal 'ESF' project and the cross-sectional Lexlern project. These projects looked at the acquisition of Dutch, English, French, German and Swedish by adult Arabic, Italian, Korean, Punjabi, Portuguese, Spanish and Turkish speakers (see e.g. Kurvers, van der Craats & Young-Scholten 2006 for further details).

projects an inflectional phrase, IP, where tense and agreement are obligatory. Finally, a complementizer phrase, CP, is projected, which allows the possibility of embedded clauses. Thus under Organic Grammar, inflectional morphology emerges in connection with syntax.

Table 1: *Organic Grammar: Criteria for stages (exemplified for L2 English)*

Stage	word order in declaratives	types of verbs	tense and agreement	pronouns	complex syntax
1a VP	resembles the NL	thematic verbs	none	none	none
1b VP	resembles the TL	thematic verbs; copula "is" appears	none	pronoun forms emerge; not obligatory	formulaic or intonation-based Qs
2 FP		thematic verbs, modals; copula forms beyond "is"	no agreement; tense and aspect, but not productive	new forms, but pronouns may still be missing	Qs formulaic or w/o inversion; conjoined clauses
3 IP		auxiliary "be" and "have"	productive tense, aspect; agreement only with suppletive forms	pronouns obligatory along with "there" and "it"	productive Qs, but may still lack inversion; simple subordination
4 CP			agreement on thematic verbs		all Qs with inversion; complex subordination

One also observes beginning naturalistic and instructed L2 learners who produce verb-less or single word utterances.³ Such utterances could be said to reveal an initial stage of development – Stage 0 – much like the child’s one-word stage, but about which little can be said regarding syntax. Stage 1 is characterized by the production of multiword utterances, along the lines of the young child’s two-word and “telegraphic” stages, where grammatical morphemes are still largely absent. Under Organic Grammar, this stage entails a “minimal” syntactic tree, with a sub-stage occurring if

³ At this stage learners may produce longer memorized unanalyzed chunks such as *My name is X*. Such forms can lead the researcher to draw erroneous conclusions regarding the learner’s stage of development (see Myles, 2004), making it imperative to look at whether the learner uses different forms of a given morpheme and a particular bound morpheme with different lexical items.

the learner's native language word order within the VP (object-verb vs. verb-object) does not match that of the target language VP. Data from a Japanese boy acquiring English (Yamada-Yamamoto, 1993) show the influence of Japanese at his earliest stage of syntactic development. In Japanese, the object precedes the verb, while in English it follows the verb. Hence this boy's first minimal tree displays Japanese word order; Haznedar (1997) and Mobaraki (2007) illustrate similar early head-final, object-verb bare VP stages in Turkish-English and Farsi-English, respectively. After several months of additional English input, the boy reaches a second sub-stage where his minimal tree switches to English verb-object word order. At both sub-stages, the boy produces non-finite forms, either bare forms like "eat" or participles like "eating" (without auxiliary forms).

- (1) Stage 1a: Japanese object-verb (OV) order
bread eat
bananas eating
- Stage 1b: English verb-object (VO) order
eating banana
wash your hand

Under Organic Grammar, after the learner's initial reliance on his/her native language, the inflectional morphology and syntax of the target language begin to develop and follow a common order for all learners of a given language. Here the development of inflectional morphology is closely connected with the development of the syntax associated with that morphology. The examples in (2) come from a cross-sectional study of primarily low-literate Somali-speaking learners of English (Young-Scholten and Strom 2004) and illustrate post-VP development in English, where inflectional morphology begins to emerge with the development of syntactic complexity. Importantly, the mere production of a new morphological form does not equate with its productivity (see footnote 3). The examples above reveal a further characteristic of development hinted at above: it is not linear. As new forms and structures emerge, they may destabilize the learner's current interlanguage grammar, resulting in new errors. Every set of utterances in (2) reveals destabilization, where the learner omits an obligatory verb or complementizer or produces non-target non-finite forms.

- (2) a. The initial functional syntax stage (Stage 2)
The woman is cry. auxiliary without *-ing*
Because too bad. subordinating conjunction, no verb

- b. Elaborated functional syntax (Stage 3)
- | | |
|---|---|
| <i>Someone's die because
he have accident.</i> | present perfect, <i>-ed</i> missing
productive simple
subordination |
| <i>Car hit the kid that's lie
down on the street.</i> | progressive, <i>-ing</i> missing
subject relative clause |
- c. Target-like functional syntax (Stage 4)
- | | |
|--|-----------------------|
| <i>The young boy was having
fun with his bike.</i> | past progressive |
| <i>When you reverse, you have to
see anybody behind.</i> | complex subordination |

For some adult L2 learners, the end state appears to be Stage 1 (see Vainikka and Young-Scholten, 2005), which may be typical of the low socio-economic stratum/low educated immigrant adults studied, for example, in the various projects referred to above. This can be attributed to low levels of exposure to the L2, where optimal exposure would include aural as well as written input from a range of sources. Alternatively, slow progress could be attributable to lack of education where aural input is processed differently by the non-literate mind (Bigelow et al., 2006; Tarone and Bigelow, 2005). Under this account, the linguistic development of educated L2 learners differs fundamentally from that of unschooled, non-literate L2 learners due to changes in the brain that occur in response to learning to read and write.

4 Perspectives on the Acquisition of Morphology

4.1 Literacy Level and its Relation to Morpho-syntactic Development by Adults

While literacy could be connected with rate of progress in morpho-syntactic development, without further exploration along the lines of Bigelow, Tarone and colleagues, it is impossible to know whether this is the result of literacy per se or the result of low quantity and quality of input. In Young-Scholten and Strom's (2006) small-scale cross-sectional study of 17 Somali and Vietnamese adults with little or no primary schooling we indeed see a significant overall positive correlation between stage of morpho-syntactic development (see Table 1) and reading level, as represented by single word decoding.

The data in Table 2 also indicate that neither reading level nor morpho-syntactic stage seems related to amount of English instruction or duration of US residence. Six of the eight unschooled adults were non-

Table 2: Morphosyntax level and reading level of L2 adults with little or no schooling

Learner/sex/age	NL school	ESL	in USA	reading level	syntax stage
V6 f 70	0 yrs	1 yr	2 ½ yrs	1	1a
S2 f 47	0	2 yrs	5 yrs	1	1a
S10 f 66	0	1 ½ yrs	3 yrs	1	1b
V1 f 51	0	1 yr	20 yrs	1	1b
S9 f 54	0	1 yr	4 yrs	1	1b
S8 f 31	0	4 mns	9 yrs	1	1b
S4 f 38	0	3 yrs	9 yrs	2	1b
V2 f 64	2 yrs	2 yrs	8 yrs	3	1a
V5 m 34	1; 4 yrs	½ yr	¾ yr	3	1a
V7 m 53	5 yrs	½ yr	3 yrs	3	1a
V4 f 43	3 yrs	½ yr	13 yrs	3	1b
V3 f 31	3 yrs	4 yrs	12 yrs	4	4
S6 f 24	2 yrs	1 yr	2 yrs	2	1b
S5 f 32	2 yrs	1 yr	2 yrs	3	1a
S7 f 30	5 yrs	1 ½ yrs	9 yrs	3	2
S3 m 30	0	2 wks	2 yrs	4	4
S1 m 26	4 yrs	0	1 yr	5	4

readers and all were at Organic Grammar Stage 1 (1a or 1b) despite ESL instruction ranging from 4 months to 2 years and residence of ¾ of a year to 20 years. That all non-L1 readers who placed at OG Stage 1 were also non-L2 readers suggests some sort of connection between literacy and linguistic development. However, the causal relationship cannot be in the direction that Bigelow and Tarone suggest, given Somali speaker S3's data. He managed during his two years of US residence to reach level 4 in English reading and OG Stage 4 without the ability to read Roman-alphabet-based Somali upon arrival or when tested and with only two weeks of ESL classes. Of course without further research, particularly data from longitudinal studies, we cannot confirm the direction of the relationship. Nor can we exclude various other possibilities – such as some sort of exceptional ability/aptitude – that might account for S3's high level of linguistic competence and ability to read.

4.2 *The Status of Morphology in Child and Adult Second Language Acquisition*

A recent challenge to the close coupling of morphology and syntax assumed under Organic Grammar is Prévost and White's (2000a/b/c), who claim that child L2 learners – but not adult L2 learners – pattern like L1 children for whom morphology and syntax are developmentally

related. They argue that L1 and L2 children's early non-finite verb utterances are indications of "truncated" syntactic structure (as in (1a) and (1b) above), where just a VP can be projected, but that adult L2 learners' relatively more variable morphological production rules out such a stage. This child L2-adult L2 difference is age driven and amounts to the proposal that children and adults do not make use of the same language-specific mechanisms in L2 acquisition, at least with respect to morphology. Logically speaking, it means that general cognitive mechanisms are instead recruited. If that is indeed the case, the acquisition of morphology could indeed be influenced by L2 instruction or level of education or literacy. But if we pick apart this syllogism, it is possible that the differences Prévost & White found are due to the latter – that morphological production does relate to the operation of general cognitive mechanisms – without entailing the former – that this completely rules out the operation of the same linguistic mechanisms as children use – to be true. To repeat Jordens' (1996) and Schwartz' (1993) points, respectively, just because second language learners can make use of general cognitive mechanisms, and just because their production reflects use of such mechanisms, does not mean these mechanisms directly drive the development of second language morpho-syntax.

Vainikka and Young-Scholten (2007) point out that Organic Grammar accounts for both the child L2 French and the adult L2 German learners' utterances discussed by Prévost and White if only a VP structure is available at the earliest stages of development. Examples from the L2 adults in Prévost and White (2000c) indicate that these learners' use of non-finite verb forms in non-finite contexts as in (3) resembles the L2 children's truncations, while the adults' use of non-finite and otherwise non-target verb forms in finite contexts and finite in verbs in non-finite contexts as in (4) is not dissimilar to children's distribution of such forms, involving "missing surface inflection" (where syntax is present, but inflection is not produced; see, e.g., Haznedar and Schwartz, 1997; Lardiere, 1998).

- | | | |
|--------|--|-------------------------|
| (3) a. | für nehmen
for take-INF | (Ana month 4) |
| b. | ich weiss nich machen
I know not make-INF | (Zita month 11.7) |
| c. | je veux partir
I want leave-INF | (Zahra month 21.7) |
| (4) a. | il faut marche
it must walk-1/2/3S | (Abdelmalek month 36.7) |

- b. du willst nich arbeite hier (Zita month 24.4)
you want not work-1S here
- c. monsieur il arriver (Zahra month 18.5)
mister he arrives-INF

Ana's ZISA study data (L1 Spanish/L2 German) resemble the child L2 data in terms of an overall low proportion of non-finite verbs, and her input likely also most resembled that received by children. Her data were collected starting at three months' exposure to German, and during the 25 months of collection, she received plentiful input from her German boyfriend. Before 10 months' exposure, Ana produced non-finite forms 13% of the time, while thereafter, the proportion of non-finite forms dropped to 5%. Like the L2 children, she almost never produced non-finite auxiliaries (only 2 out of 62). But it does appear that both truncation and missing surface inflection are operative in her data, with the 5% rate (after month 10) representing the latter. We propose that the allegedly weaker link between syntax and morphology for L2 adults vs. L2 children is connected to individual variation resulting from adults' greater use of meta-cognitive mechanisms, which in turn may be connected to literacy. But, as noted above, we have insufficient information on these learners' levels of native language education, on their L1 or L2 literacy levels or practices or on their input (apart from what is mentioned here for Ana).

Mobaraki's (2007) UK study of two eight- and nine-year old Farsi-speaking siblings learning English reveals morphological variability among L2 children. In his 20-month longitudinal study of Bernard's and Melissa's development of morpho-syntax, Mobaraki found that Bernard's significantly higher scores on a battery of working memory and processing tasks correlated with his overall rate of acquisition of particularly the two typically late-acquired English morphemes regular past *-ed* and third person singular *-s*. Compared to Melissa, Bernard was an avid reader in both Farsi (which both could read upon arrival in the UK) and English, so we therefore do not know whether the variation in rate of morphological development observed was due to underlying cognitive differences (working memory/processing) or to a greater amount of input. The effect of exposure to written input is unclear. Does reading simply provide additional primary linguistic data or is the effect a visual one, in terms of exposure to print? The effect of literacy on working memory and processing is equally unclear. These are all factors that require much closer examination before drawing any conclusions about the effect of literacy on morpho-syntactic development. These results from two educated, literate children suggest a gradient rather than categorical effect of literacy on an individual's processing of input.

We now turn to a study of naturalistic but educated adults which

reveals an unexpected effect of meta-linguistic processing on the development of morpho-syntax.

4.3 *Meta-linguistic Awareness and the Second Language Acquisition of Morpho-syntax in German*

Do educated adults differ from each other in how they handle morphology during second language development? If so, perhaps literacy *per se* is not the (only) critical variable. To answer this question, we consider data from a longitudinal study of three American secondary school students who spent a year in Germany learning that language *ab initio*. While the three were normal US students (i.e. literate), data from one of them provide evidence that use of cognitive mechanisms can indeed affect linguistic development.

There is overwhelming evidence that when adult L2 learners receive input that is not in the form of primary linguistic data, this alters their linguistic behavior in some way; see Ellis' (1990) overview of earlier research. Studies of instructed learners typically assume that meta-linguistic processing promotes L2 development or has at worst a neutral effect due, for example, to the timing of instruction (Pienemann 1987). Felix (1985), however, has proposed that post-puberty learners' use of general cognitive mechanisms blocks their access to Universal Grammar. Perhaps because it is so difficult to measure how the language module and primary linguistic data interact with input that activates general cognitive mechanisms, Felix's ideas have received scant empirical attention. This is certainly the case with respect to non-classroom learners where their use of meta-linguistic mechanisms is largely ignored. We will see below that the idea of LLK is misleading. "*Learned* linguistic knowledge" implies instruction, but general cognitive mechanisms can be recruited and LLK accumulated without the assistance of a teacher or a grammar book.

To better interpret the information in Table 3 below, we briefly present some facts about German. As in English, agreement with the subject is marked on either the main verb, modal verb, copula or auxiliary (forms of *be* or *have*, similar to English), and tense marking involves an auxiliary verb plus a past participle:

- (5)a. Claudia trinkt immer Kaffee aber ich trinke normalerweise Tee.
 Claudia drinks always coffee but I drink normally tea.
 "Claudia always drinks coffee but I normally drink tea."
- b. Hast du gestern Tee getrunken? Trinkst du heute Kaffee?
 have you yesterday tea drunk drink you today coffee
 "Did you drink tea yesterday? Are you drinking coffee today?"

- c. Kräutertee habe ich gestern getrunken, weil ich heute viel Kaffee
 I have yesterday herbal tea drunk because I today much coffee
 trinken muss.
 drink must
 “I drank herbal tea yesterday because I have to drink a lot of
 coffee today.”

These examples illustrate three further facts about German. In both (a) and (c), the finite verb in declarative clauses is in “second position” (i.e., it has been “raised” from the VP). The verb can be preceded by only a single constituent, which in (a) is the subject, and in (c) the object. The first clause in (c) illustrates the position of the non-finite verb in German, where a participle or any other non-finite verb form follows all other material. In the second clause, the finite verb follows the non-finite verb due in this case to the complementizer *weil* (“because”) filling the position that the finite verb otherwise occupies. (b) shows that like English German forms questions through subject-verb inversion, but the thematic verb and subject invert where in English the dummy auxiliary “do” is required.

The analysis of data from adult speakers of English, Italian, Korean, Spanish and Turkish learning German (see Vainikka and Young-Scholten, 1994; 1996; 1998) yields the stages of Organic Grammar for L2 German shown in Table 3; these are identical to those shown in Table 2, apart from the column for verb raising.

The data under discussion here come from the VYSA⁴ study of Joan, Paul and George, whose first exposure to German was when they arrived in a large city in a standard-dialect-speaking area in July 1996. Starting three weeks after their arrival, data were regularly collected from each learner for a year. None had substantial experience in formal foreign language learning, and their development of German proceeded generally without instruction during the year they spent living with host families and attending German secondary schools. They were essentially naturalistic learners and we expected them to exclusively use language-specific mechanisms to acquire German.

All three learners participated in a four-week language and culture course in July when they first arrived. Together with other monolingual ab initio American exchange students, they spent mornings on the rudiments of German grammar with a teacher who spoke to the group in English. The course textbook combined the notions and functions of the European Communicative Approach with grammar explanations and translation. Grammar points – including various verbal paradigms – were

⁴VYSA = Vainikka and Young-Scholten’s Americans

Table 3: *Stages in the L2 acquisition of German*

Stage	word order in declaratives	types of verbs	tense and agreement	pronouns	verb raising	complex syntax
1a VP	resembles the NL	thematic verbs	none (non-finite <i>-n</i> forms)	none	no	none
1b VP	resembles the TL	copula <i>ist</i> appears	none	pronoun forms emerge; not obligatory	no	formulaic/intonation-based Qs
2 FP		new copula forms modals	none (apart from suppletive forms)		some	Qs formulaic/uninverted; conjoined clauses
3 IP			productive tense and agreement on thematic verbs	obligatory	frequent	productive Qs, may be uninverted; simple subordination
4 CP					obligatory	all Qs with inversion; complex subordination

Table 4: *The VYSA learners*

Learner	Previous exposure to foreign languages	Age at arrival in Germany
Joan	1 month of Spanish; no German	16
Paul	1 semester of French; no German	17
George	1 year of French; no German	15

presented in visually salient pink-shaded boxes in the text. Thus while the vast majority of input these learners received in German during the year they spent in Germany constituted primary linguistic data, their language course made available to them the basic tools for meta-cognitively processing, i.e. learning, German. Observation by the second author of the students during one of the course sessions and subsequent negative comments indicated that the three learners were not motivated to seek benefits from the language classes. Low motivation was doubtless compounded by the absence of any testing and by the students' initial host families' ability to communicate in English. The amount of naturalistic exposure learners got during their first four weeks in Germany was negligible; the group spent their free time outside the class together. At the end of the four-week course, the group dispersed to new host

families across non-dialect-speaking Germany and began attending local secondary schools as fully matriculated students. Data come from monthly sessions where Joan, Paul and George engaged in animated conversation with the second author about their unfolding and challenging exchange experience as well as from the administration of a battery of broad and narrow tasks, including grammaticality judgment tasks where sentences were read but the resulting data were oral.

Adopting the position that there is a critical period for language acquisition that closes around puberty (Lenneberg, 1970) entails assuming fundamental differences exist between children and adults, where the latter rely on general rather than cognitive domain-specific mechanisms. This is a view held by a number of researchers, some of whom maintain that children's acquisition is driven by language-specific mechanisms but adult acquisition is not (Bley-Vroman, 1990; Clahsen & Muysken, 1986) and others of whom maintain that adults differ from children, but who (following child language development researchers such as MacWhinney, e.g., 2004) do not assume modularity of mind for learners of any age but rather a decrease in ability to learn implicitly (e.g., DeKeyser, 2000). For these researchers, the operation of general cognitive mechanisms involves the conscious attention to features of the input, and since Schmidt (1990), there has been considerable research effort expended on determining whether a learner *notices* those forms in the input that signify grammatical functions. Schmidt and others (e.g., Robinson, 1995) propose the Noticing Hypothesis, which predicts that input only becomes intake when elements are noticed. How can we determine when a naturalistic, non-classroom learner notices something? Used as a measure of meta-linguistic awareness by young children learning their first language (Gombert, 1992), we interpreted the frequent self-correction the three learners engaged in during data collection sessions as one sign of noticing. What learners self-corrected was case and gender, subject-verb agreement and word order (though not always leading to the correct target form or construction). As an additional measure, we considered meta-linguistic comments made during sessions as evidence that forms had been noticed, and further attempted to determine whether they understood what they had noticed. Remarks shown here are representative of what the learners said during interviews (note there is a one-month lag in the data collection sessions relative to initial exposure, i.e. session IX occurred ten months after arrival in Germany). Where some of the tasks encouraged conscious focus on grammar, comments were most often made then, and sometimes elicited, as in (6) (M=interviewer), where elicitation of such comments was the aim of the grammaticality judgment task. For this task, learners read a set of declarative clauses which involved the finite verb in second position preceded by a non-subject constituent (as in 5b above) or in (ungrammatical) third position.

(6) Joan Session IX (during Grammaticality Judgment Task)

- M:** Weißt du was 'den Mann' ist?
know you what the (acc.) man is?
- J:** *Etwas mit Grammatik. Oder ich weiß nicht.*
something with grammar or I know not
Ich kenne überhaupt nichts mit Grammatik.
I know absolutely nothing with grammar

The next example comes from a task where, while there was essentially no meta-linguistic focus, Paul nonetheless expresses the deep concern with his progress in German that is typical of him.

(7) Paul V (during Picture Description Task)

- P:** *Ein Mann wills, willst jetzt mein Stuhl um sit, sitzen.*
a man wants wants now my chair uh sit sit
- P:** *Can you say this? Like to sit? Set. Sitz. I don't know. I've never heard it. I never heard it used that way.*
- M:** How've you heard it used?
- P:** *Sitzt. Like to sit. But I don't know if you can add an -en to make it...*
- M:** To make it what?
- P:** *Whatever. To make it whatever they do. I don't know.*

Joan's and Paul's comments reveal little understanding of what they had noticed; however, George demonstrates in example (8a) and (8b) what was typical of his approach to his interlanguage German. He not only notices, but understands the function of what he is noticing, accurately using such terms as 'accusative' and recounting details of the content of the German grammar book and the language lessons. It is possible this is due to his relatively longer exposure to classroom foreign language instruction and strengthened by his self-reported positive attitudes related to the experience of learning French.

(8)a. George II (during Word Combining Task)

- G:** *Was hast du getrunken? Ooh, I'm doing these wrong.*
- M:** Why?
- G:** *I could use different forms and they'd be easier. I don't remember all the forms with rummar. I just put them all in the past tense.*
- M:** Oh, ok. Is that easier?
- G:** *For me it is, yeah.*
- M:** Why?
- G:** *I don't know. That's the only thing I really got was the perfect.*

b. George XI (During Grammaticality Judgment Task)

G: *Four verbs in a sentence. What do I do?*

M: Yeah...

G: *Then I think for about a minute and I don't know. And then that's it.*

M: So, do you ever, like, listen?

G: *I played around with the verbs when I'd look at people, when they scowl their eyes or something like they don't understand. Then I think that's wrong.*

G: *Writing helped a little, too. I had to write a few reports. And seeing them on paper. Just seeing patterns on paper where verbs ought to go. I still haven't figured out with three or four verbs but I think if I write another three or four reports I'll probably figure it out.*

George seems to be an ideal second language learner and the morphological data relating to his development bear this out. Early on he uses various forms of *haben* ('have') correctly 37/43 times (86%), more often than the other two, and he also produces more forms of *haben*. Paul is at the other end of the spectrum, with a few over-generalized forms (1/6 = 16% accuracy) and Joan is in the middle, producing correct forms 50% of the time (9/18). George also makes more rapid progress in his use of agreement suffixes on thematic verbs.

Table 5: *Accurate use of haben 'have' in Samples I & II*

	<i>habe</i> (1sg)		<i>hast</i> (2sg)		<i>hat</i> (3sg)	
	correct	wrong	correct	wrong	correct	wrong
Paul	0	5	1	0	-	-
Joan	3	3	4	5	1	0
George	5	0	9	4	10	0

	<i>haben</i> (1; 3 pl)		<i>habt</i> (2pl)	
	correct	wrong	correct	wrong
Paul	-	-	-	-
Joan	1	1	-	-
George	8	2	5	-

Table 6 shows that all three learners are typical at the start: at Stage 1a, the basic VP projection is transferred from their L1 English (verb-object order) and then at Stage 1b its headedness is switched to German (object-verb order). All three learners next add a functional projection to their syntactic tree, as predicted under Organic Grammar (see Table 3).

Table 6: *The syntactic stages for Joan, Paul, and George for various samples (I – XI)*

Stage	Description	Joan	Paul	George
1a	head-initial VP, as in English	I-II	I-II	I-III
1b	VP switches to German head-final	III	III	IV
2	head-initial FP	III-IV	IV	III
3	head-initial CP added	VII	VII	VIII
4-i	IP switches to final	IX	Xi	[never]
4-ii	IP final throughout	XI	[never]	[never]

George is more advanced in terms of morphology than the other two speakers; however, studies of naturalistic child and adult L2 learners of German (Vainikka and Young-Scholten, 1994; 1996) and L2 English (Hawkins, 2001; Mobaraki, 2007) show that functional morphology does not rapidly emerge even where the potential for L1 transfer of such categories exists. George's early use of agreement with respect to *haben* and of production of additional inflectional morphology seems to represent atypical development that points to his application of general cognitive strategies. On the other hand, given the tight coupling under Organic Grammar of inflectional morphology and syntactic structure, we might expect his morphological prowess to confer a syntactic advantage. But the further syntactic development of these three learners paints a surprising picture. George consistently lags behind the other two in his syntax where unlike they do (see Vainikka and Young-Scholten, 2002), he never reaches the stage of development where the IP switches headedness, where the finite verb appears in final position in embedded clauses, as in example (5c). George's mis-development may well be due to the "meta-linguistic baggage" that he carries which interferes with UG-based unconscious acquisition mechanisms. In Felix's (1985) terms, "competition" between general cognitive mechanisms and linguistic ones results in the latter losing out. Relevant to Prévost and White's (2000a/b/c) claims regarding the relationship of morphology and syntax and adult L2 acquisition is George's low use of the suffix *-n* on thematic verbs. These forms figure prominently in truncations in early stage German, and unlike Joan and Paul, George instead produces correctly inflected thematic verbs. The result is indeed a disconnection between morphology and syntax such that syntactic development is impeded.

These results revive Felix's (1985) competing cognitive structures idea and in turn relate to the triggering role proposed for inflectional morphology in the course of the development of syntax (Vainikka and Young-Scholten, 1998; Hawkins, 2001). The results also present a

challenge to Ellis's (1990) conclusions on the effect of instruction in that meta-cognitive processing can alter the route of L2 development. This of course begs the question of positive influence. If there is an interface between general cognitive mechanisms and language-specific mechanisms with respect to the influence of morphology on the development of syntax, why should the influence be only negative?

George's case shows that adult L2 learners can develop meta-cognitive/meta-linguistic strategies and amass LLK without much reliance on instruction; Joan's and Paul's cases demonstrate lack of a 1:1 relationship between LLK and instruction. Such variation is expected; unlike linguistic competence distribution of general cognitive abilities exhibits considerable variation across individuals. What meta-cognitive mechanisms constitute and how they are applied will vary considerably where consciousness and control are also factors; e.g. Gombert distinguishes pre-school children's *epi*linguistic knowledge from their later (subject to control, volition/intention) *meta-linguistic* knowledge. Our study of George vs. Joan and Paul shows that use of meta-linguistic processing varies even for older learners in naturalistic situations. This could well be true for older learners with little native language education.

4.4 *Triggering Data and the L2 Acquisition of Morpho-syntax*

The studies reviewed here thus far show that (1) morphological variation during L2 development does not appear to qualitatively differ for children and adults; (2) rate of development of inflectional morphology can be influenced by language-module external factors for *both* adults and children; (3) there appears to be some sort of link between ability to read and progress in morpho-syntax acquisition; (4) morpho-syntactic development is influenced by meta-cognitive processing. (1) and (4) contradict each other. So let us consider how the language-specific mechanisms that are involved from moving the learner from one developmental stage can be influenced by what falls under general cognitive processing.

The notion of *parameter* (Chomsky, 1981) continues to form the basis of a principled account of cross-linguistic variation and of acquisition. What is commonly assumed is the desirability to limit such variation in the lexicon, i.e. in that portion of the language that has to be learned. For the purposes of syntactic variation between grammars, the *closed-class* portion of the lexicon is crucial, e.g. elements such as tense and agreement marking. Inextricably tied to the notion of parameters is the idea that specific parameter settings are triggered during language acquisition (see e.g., Gibson & Wexler, 1994, and, more recently, Sakus and Fodor, 2001). One assumption is that triggers have to be robust in the input data. In George's case, he is not waiting to subconsciously extract the inflectional

morphology from the primary linguistic data surrounding him; rather, he is trying to give himself a head-start by focusing on memorized paradigms. Thus while he is indeed *acquiring* syntactic structure, he appears to be *learning* some of the crucial morphology. This is a mismatch which prevents the language-specific mechanisms from operating naturally.

Zobl & Licerás' (1994) review of the morpheme order studies carried out in the 1970s on L1 children and L2 children and adults prompted Vainikka and Young-Scholten's (1998) consideration of variable triggering data. L1 children tend to acquire bound morphemes first while all L2 learners acquire free morphemes, and then the related bound morphemes, as shown in Table 7.

Table 7: *Relative morpheme order in English acquisition (V & Y-S 1998, based on Zobl & Licerás 1994)*

Related functional projection	Morpheme order in L1A	Morpheme order in L2A
Nominal (DP)	1. possessive	1. article
	1./2. article	2. possessive
Verbal (IP)	1. past & 3SG	1. auxiliary
	2. auxiliary	2. past & 3SG

Under the theory of Organic Grammar, where the language learner posits as few positions and projections as needed to account for the relevant input data at any given stage of development, triggering input is highly relevant. Given the full operation of language-specific mechanisms and little first language influence, Organic Grammar predicts that learners will be completely successful in the acquisition of morpho-syntax in the second language. Adult L2 learners appear to be less successful in the long run than child L1 learners. Why? Vainikka and Young-Scholten (1998) ask whether triggers for first language learners also act as triggers for second language learners, and based on existing L1 and L2 acquisition data, the proposal was that *bound morphemes* such as inflectional affixes typically function as triggers in L1 acquisition but *free morphemes* do so in L2 acquisition. While there is some flexibility here, if a particular parameter can only be triggered by a bound morpheme, this parameter will be difficult or impossible to set in L2 acquisition, resulting in a fossilized non-target grammar. The German equivalent of Table 7 is Table 8, with the morphemes translated into triggers.

We suspect that the distinction between bound and free morphemes as triggers may be derivable from phonology: Free morphemes such as auxiliaries typically constitute at least a phonological foot, while bound morphemes typically involve units smaller than a foot. Lack of

phonological attainment may in turn result in incomplete analysis of sub-foot constituents in the learner's L2.

Table 8: Triggers for positing functional projections in the acquisition of German

Stage (Projection)	Trigger in L1A	Trigger in L2A
Stage 1a (VP)	stress pattern	L1 bootstrapping
Stage 2 (FP)	3 person singular <i>-t</i>	modal verbs
Stage 3 (AgrP)	agreement paradigm	copula paradigm
Stage 4 (CP)	object clitics	complementizers

5 Conclusion

The studies discussed here show that rate of development of inflectional morphology is influenced by language-module external factors for *both* adults and children. Our analysis of data from educated young adult George reveals how morpho-syntactic development appears to be influenced by application of general cognitive mechanisms. The relative speed of George's mastery of inflectional morphology can be traced to his metacognitive processing of German, but it constitutes LLK. Where we find that George's morphological speed results in an atypical syntactic route, we have evidence of the indirect effect on syntactic acquisition of metacognitive processing – explained by how triggering data typically operates. If problems post-puberty learners have in attaining native morpho-syntactic competence in a second language boil down to poor use of triggers (e. g., items such as “the” and “is”), can the learner being “forced” at the right time to deal with them during reading, making triggers more available to the learner? If the L2 English learner is producing utterances such as “Car fast” and is then learning to read sentences like “The car is fast”, does this prompt the learner to move from the VP Stage, Stage 1, to the next stage? Answers to this and a range of other questions await further research.

Finally, our review of studies suggests that Prévost and White's (2000a/b/c) conclusions regarding child-adult L2 morpho-syntactic differences are premature. There is a need to devote considerably more attention to the roles played by literacy, education, print exposure and meta-cognitive processing during the acquisition of morpho-syntax in a second language, as the recent work by Tarone, Bigelow and colleagues demonstrates. Studies carried out must consider what we already know about the interplay of inflectional morphology and syntax during acquisition. Because age, literacy and input have tended to be confounded (Moyer, 2004), studies examining the role of literacy need to include learners of varying ages from six (Long's 1990 critical period termination for phonology) to post-compulsory schooling. And finally, these studies

must acknowledge the positions represented by various theoretical frameworks, as shown in Table 9.

Table 9: *Some hypothesis on the involvement of literacy in acquisition of morpho-syntactic competence*

	Hypothesis	Testable by	Evidence from	Hypothesis Status
Strong generativist hypothesis	Literacy does not affect acquisition.	looking at L2 learners regardless of their literacy, etc.	existing studies of immigrants	supported
Indirect influence hypothesis	Literacy affects morphology which in turn affects syntax.	comparing non-literate and literate L2 learners	Tarone, Bigelow and colleagues' work	some support
Indirect influence hypothesis II	Literacy affects phonology which affects operation of triggers (morphology) which affects syntax.	comparing non-literate and literate L2 learners	Weak generativist hypothesis: Vainikka & Young-Scholten 1998	some support
Interface hypothesis	Literacy affects processing which affects acquisition of morphology and syntax.	comparing non-literate and literate L2 learners	Tarone, Bigelow and colleagues	some support

We hope these hypotheses will inspire a surge of research on the under-examined issues of how literacy and how meta-cognitive processing influence the development of morpho-syntactic competence in a second language by learners of all ages.

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