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## **Universal minimal structure: Evidence and theoretical ramifications**

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## **1 Introduction**

### **1.1 The need for an acquisition mechanism**

Although functional projections (or categories) play a major role in syntax – in that they form the backbone of the structure of any sentence – there is much uncertainty in the fields of syntax and acquisition concerning the identity, nature, feature content, and possible development of these projections (e.g. Weibelhuth 1995:83; Lardiere 2009). At the heart of the debate over functional projections is the basic question of whether these projections are acquired, or whether they are always present in the learner’s grammar.

In terms of background assumptions, we maintain that functional categories exist, but for the purposes of this paper, their exact feature content is not crucial. In much of current Minimalist theorizing (Chomsky 1995, 2001, 2008), functional projections or categories have ceased to have their own meaningful existence and are instead clusters of features or feature matrices. With respect to acquisition, Lardiere (2009) questions reference to acquisition of functional projections. If, as proposed in Hegarty (2005) features are acquired one by one (leading e.g. to interlanguage grammars), the notions of ‘parameter’ and ‘functional category’ disappear. We believe that Baker (2008; chapter 5) has effectively proven the existence of macroparameters of the traditional type; this idea, when applied to functional projections, results in the view that languages may differ in terms of the existence and location of specific projections.<sup>1</sup>

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<sup>1</sup> For example, although NegP occupies a low position in the Germanic languages (such as

## Universal minimal structure

Culicover and Jackendoff (2005) offer an analysis of the historical development of syntactic ideas according to which most of generative syntax makes an implicit assumption about structure,<sup>2</sup> namely that, to the extent possible, sentences are maximally uniform. What this means in practice is that all sentences (in all languages) have fully projected functional structure, or a full CP tree. Perhaps the most extreme application of this approach is Cinque (1999) where 30+ functional projections are posited to account for adverb interpretation and word order (in Italian); since these projections are needed in one language, given the Uniformity Assumption Cinque (implicitly) espouses, it follows that all 30 or more projections must be universally present in every language (see also Cinque 2010 on a similar analysis of adjectives). As Culicover and Jackendoff (2005) point out, syntactic theories choose either to simplify principles, or to simplify structures; Minimalism (Chomsky 1995, 2001, 2008) chooses to simplify distinct principles of grammar rather than structure.

Extending the idea yet further, the Uniformity Assumption also typically holds in generative research on both L1 and L2 acquisition, *across stages of development*, i.e. the full CP tree is assumed to be both accessible and used by speakers for constructions at all stages of syntactic acquisition. In first language acquisition, this idea is traditionally called either the Full Competence Hypothesis or the Strong Continuity Hypothesis (Boser, Lust, Santelmann & Whitman, 1992; Hyams, 1992, 2007; Lust, 2006; Poeppel & Wexler, 1993; Wexler, 2004). Representing this idea in L2 acquisition is the Full

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English), there is clear evidence that the NegP is the highest IP-level projection in Finnish – sentential negation is an auxiliary verb on which agreement (but not tense) is realized (Holmberg, Nikanne, Oraviita, Reime & Trosterud, 1993).

<sup>2</sup> Culicover and Jackendoff (2005:46-47) break down Uniformity which they note is implicit in all versions of Chomskyan syntax into three parts: i. Structural Uniformity: Apparently defective/misordered structure is a distorted regular form. ii. Interface Uniformity: Syntax-semantics interface maximally simple: meaning maps transparently onto syntactic structure; and is maximally uniform; the same meaning always maps onto the same structure. iii. Derivational Uniformity: Where possible, derivations are maximally uniform. Interface Uniformity gives rise to a full CP projection for all questions, and forces a meaning on Root Infinitives distinct from finite clauses in the adult language. We take issue with (ii) but maintain the fundamental aspects of assumptions (i) and (iii) as they allow for syntactic movement and abstract elements. Below we use the

## Universal minimal structure

Transfer/Full Access (FT/FA) hypothesis of Schwartz & Sprouse (1996), as well as Epstein, Flynn and Martohardjono (1996), Lardiere (1998, 2003), and White (2003).

In addition to the historical and theoretical grounding of the Uniformity Assumption in generative syntax, there are obvious benefits in assuming uniformity of structure across developmental stages. First, no acquisition mechanism is needed for syntactic structure. Second the direct mapping between semantics (or, Logical Form) and the complete CP structure can be maintained during stages of acquisition, allowing for standard representation of questions and other constructions as CPs. As we take issue with the Uniformity Assumption, we will need to address its apparent benefits in more detail.

In this paper we review evidence for an early stage in acquisition without functional projections. The crucial point here is that if there exists *any* stage of (L1) acquisition of *any* language that represents something less than the full adult structure, a mechanism for acquiring the missing projections is needed in Universal Grammar. Furthermore, if there is any such evidence of reduced structure at some stage of development, Uniformity *cannot* be maintained for all of L1 development. Thus, the apparent benefit of the Uniformity Assumption that no acquisition mechanism is needed for functional projections turns out to be a false one. We begin the conversation of what the actual acquisition mechanism might look like in Section 5.2.

In what follows, we summarize data from typical and atypical first language acquisition and from second language acquisition that point to the existence of an early stage with very little structure – a bare VP stage – prior to the development of functional projections. The discussion is not intended to be a comprehensive review of research on the early stages of syntactic acquisition. However, the evidence we consider points to

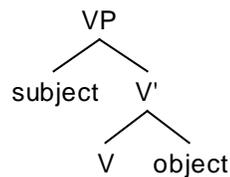
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general term 'the Uniformity Assumption' to refer solely to (ii) Interface Uniformity.

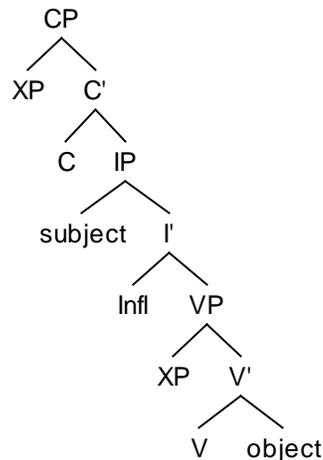
## Universal minimal structure

the conclusion that the typical L1 data and child and adult naturalistic L2 data show an early bare VP stage for at least some speakers. As pointed out above, this is sufficient to make our point. While less studied in the relevant respect, data from cases of exceptional L1 acquisition indicate that *all* acquisition of syntax might begin with a bare VP projection, followed by a subsequent development of functional projections. To make the proposal concrete, we propose that syntactic development begins with a tree structure provided in (1) for English, in contrast to various proposals involving more structure such as the tree in (2) from the beginning of acquisition:

(1)



(2)



For the most fully articulated approach involving the course of acquisition of functional projections to date, see Vainikka and Young-Scholten (2011) on the naturalistic L2 acquisition of German by three American high school students; we argue that these speakers acquire the functional projections NegP, TP, AgrP and CP, in that

4

Universal minimal structure

order.

## 1.2 The problem with maturation

Several proposals in the L1 acquisition literature invoke biological maturation to explain the apparent emergence of functional projections. In his classic argument for a bare VP stage in English, Radford (1990) presumes that children's functional projections all mature at once. Rizzi (1993/4) takes a slightly different tack to account for the presence of Root Infinitives in early acquisition: truncation or omission of the CP projection. He suggests that the requirement for a CP matures, although in later work (e.g. Rizzi 2005) maturation is no longer assumed. For Wexler and colleagues (Wexler 1994; Wexler, Schütze & Rice 1998), on the other hand, TP is optionally projected and is assumed to mature.<sup>3</sup> In cases of Specific Language Impairment, maturation of TP seems to take longer than for typically developing children (Rice, Wexler & Cleave 1995; Rice & Wexler 1996). On the other hand, in discussing data from the L2 acquisition of English, Wexler and colleagues accept that maturation cannot be the explanation for the grammatical stages observed (Ko, Ionin & Wexler, 2010:248).

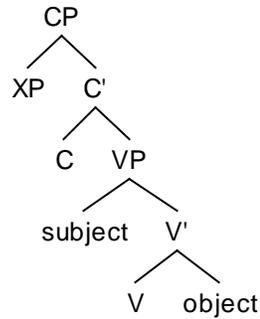
While Rizzi's Root Infinitive proposal corresponds to the VP-tree in (1) above, Wexler's approach differs from Rizzi's in that a CP projection can be posited over a VP projection (with TP underspecified), perhaps as in (3):

(3)

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<sup>3</sup> More recently, Wexler (1998, 2000, 2004) has proposed the Unique Checking Constraint as an explanation for Root Defaults, namely that only one D-feature of a DP can be checked at his Optional Infinitive stage. However, this approach seems to involve maturation, as well.

## Universal minimal structure



Although we accept reduced structure for L1 children's early utterances (à la Rizzi), an explanation involving biological maturation must be ruled out, given that an early stage with reduced structure is also attested in naturalistic adult L2 data. Furthermore, adult L2 data reveal developmental stages for various functional projections (Hawkins 2001; Vainikka & Young-Scholten 2011). Such results exclude proposals that rely on maturation as the general developmental driver of functional projections. This makes apparent the need for a single non-maturational acquisition mechanism which covers both L1 acquisition and child/naturalistic adult L2 acquisition.

Previous work on acquisition that relaxes the Uniformity Assumption, and that may not invoke biological maturation, falls into two classes (a) the IP-approach and (b) the VP-approach (our terminology). Under both approaches learners' earliest stages of acquisition are argued to involve UG-constrained, reduced structure, resulting in utterances with few (or no) functional elements. The IP-approach is the standard structure building approach in the L1 research on German/Dutch, where it is argued that from the beginning of syntactic acquisition, children posit at least one functional projection (Clahsen's 1991 FP, or some IP-level projection), but the CP projection is acquired later.<sup>4</sup> Clahsen's (1988, 1991) Lexical Learning approach of Clahsen and the

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<sup>4</sup> But see Tracy (2002) who argues that the potential IP-related constructions in the earliest German data are instead "V2 mimicry" which should be treated as unanalyzed, memorized chunks. Döpke's (1998; 2000) longitudinal data from four bilingual English/German children indeed reveal a bare VP stage.

## Universal minimal structure

work of Hamann, Penner and Lindner (1998), Meisel and Müller (1992), Roeper (1996) represent this view. In our view, the IP-approach invokes a different status in UG for projections above and below IP, both in terms of parametric variation and acquisition, since UG would directly provide the lower projections but not the higher ones – a result we wish not to allow. We therefore adopt the VP-approach.

The VP-approach in L1 acquisition is known as the Structure Building, or Weak Continuity, approach (Guilfoyle & Noonan 1992; Lebeaux 1988; Radford 1995; Vainikka 1993/4). In L2 acquisition, this view is known as the Minimal Trees approach (Vainikka & Young-Scholten 1994, 1996; Myles 2005), Modulated Structure Building (Hawkins 2001), and most recently, Organic Grammar (Vainikka & Young-Scholten 2011).

Before turning to evidence from a variety of acquisition situations, we briefly digress to consider the possibility of questions (and other sentences) without a CP projection.

### **1.3 Questions without a CP?**

The second apparent benefit of Uniformity mentioned above is the direct mapping between LF and syntax in terms of the CP projection. During early stages of L1 acquisition children produce non-adult questions and these are often taken as evidence for a full CP projection. In order to pursue the VP-approach, we need the means to represent such questions without a CP projection; the same point has been made by Radford (1995) concerning (adult) questions of the “Huh?” type.

Let us assume that the prototypical syntactic structure for an interrogative clause is a CP projection, universally. Similarly, a prototypical syntactic structure for a statement would be TP (or equivalent), assuming economy of projection, as we do. For

## Universal minimal structure

present purposes, we will also assume that the prototypical syntactic form of an imperative is a VP, or less than a full finite TP (cf. Zannuttini 2008). Two points will become apparent when one considers the following (hypothetical) conversation involving adult native speakers of English: (1) various types of reduced structures are readily produced, and (2) the correlation between the syntactic structure and the corresponding (prototypical) pragmatics does not always obtain.<sup>5</sup> Given a situation where A is wrapping presents and B is acting as the assistant, consider the following constructed dialogue and the rough syntactic and pragmatic analysis of each utterance:

	<i>Actual syntax</i>	<i>Implied syntax</i>	<i>Implied pragmatics</i>
A: Could I have that yellow ribbon, please?	CP [interr.]	VP [imperative] ['Give me...']	polite request for action
B: This one? <i>[A nods; B hands ribbon.]</i>	DP + inton.	CP [interr.] ['Do you mean...']	request for info
A: How do you like this masterpiece?	CP [interr.]	CP [interr.]	request for info
B: Great!	A(P)	TP [indic.]	response to request
B: You want this small package next?	TP + inton.	CP [interr.]	request for info
A: No, I think I better do the big one now.	TP	TP & VP [imper.] ['Give me...']	request for action
B: OK. Let me lift it up.	VP [imper.]	TP [indicative] ['I'll lift it up.']	response to request

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<sup>5</sup> Thanks to an anonymous reviewer for starting this train of thought.

## Universal minimal structure

In this dialogue, there is only one utterance where the visible syntactic structure corresponds to the prototypical CP structure of a question, namely ‘How do you like this masterpiece?’ In most of the other instances, the listener is forced to draw inferences from less (or more) than expected structure to arrive at the intended pragmatic interpretation.

The conclusion we wish to draw here is that native speaking adults use reduced syntactic structures. However, our claim is that language learners at early stages *do not have the option of using full CP (or TP) structures* even for those constructions – such as questions – that universally favor them. Thus, given a reduced question such as ‘*What?*’ in response to ‘*I bought you something*’, we assume that the semantics and the pragmatics of the question ‘*What?*’ are similar regardless of how advanced a speaker is who utters it. For a child or L2 learner at an early stage of acquisition, this may be the only *syntactic* way of forming the question (i.e. DP + intonation), and forming a full CP question would not yet be possible (‘What did you buy?’). UG must provide a mapping between the syntax, semantics, and pragmatics of actual questions which does not require a full CP projection in syntax (despite a universal preference for that structure).

## 2. Root Defaults in typical L1 acquisition

In early L1 acquisition, it is straightforwardly observed that grammatical elements associated with functional projections are typically absent (the main point in Radford 1990). However, due to the difficulty of determining whether the projections themselves are absent or whether they are present but not used (because the morphemes have not been acquired or due to performance factors), the presence or absence of grammatical morphemes as such does not allow us to make a sufficiently strong argument about the

## Universal minimal structure

presence or absence of functional projections. A much stronger argument could in principle be made based on the *presence* of a construction typical in early acquisition, but not found in comparable contexts in the target language.

Such a construction is the so-called Root (or Optional) Infinitive structure referred to above. Following Paradis and Crago (2001), we refer to these utterances as Root Defaults, as the construction does not necessarily involve an infinitive (cf. Hyams 2005; Varlokosta, Vainikka and Rohrbacher 1998). Root Defaults are non-adult utterances in which verbs do not appear in finite form and subjects are optional when a full, tensed clause would normally be expected. This construction is well documented in children's early production in a range of languages; see e.g. Phillips (1995), Rizzi (1993/4), Wexler (1994), and more recently, Gülzow and Gagarina (2006) and Kallestinova (2007) for Russian, and Licerias, Bel and Perales (2006) for Spanish.

Much of the early discussion in the L1 literature has referred to German or Dutch acquisition data because of the relative ease (in comparison to well-studied English) of identifying Root Defaults in terms of both syntactic position and status as non-finites; in German (and Dutch) these are verb forms typically ending in *-n*. This syntactic evidence is crucial to the claim that the utterances under consideration are Root Defaults. An adult sentence such as (4a) shows the obligatorily raised and inflected thematic main verb, *geht*, 'goes' and (4b) illustrates the modal *darf* 'may' obligatorily appearing in a raised functional position, while uninflected *gehen* 'go' is in non-finite form in its base position in the German head-final VP.

- (4) a. Beate geht heute nach Hause.  
Beate goes today to home  
'Beate is going home today.'
- b. Beate darf noch nicht nach Hause gehen.  
Beate may still not to home go

## Universal minimal structure

'Beate isn't allowed to go home yet.'

Given what a beginning language learner can be assumed to know about German, it is reasonable to conclude that the verb *gehen* is non-finite and is in its base, head-final VP position when, for example, a child first produces a non-adult utterance as in (5a).

These examples from Meike at age 1;10 show how verbal morphology and verb position along with non-obligatory subjects indicate a Root Default (examples from Mills 1985):

- (5)
- a. hause gehen  
home go-INF  
(Ich gehe nach Hause.)<sup>6</sup>  
'(I) go home.'
  - b. teddy holen  
teddy get-INF  
(Ich hole den Teddy.)  
(I) get the teddy.'
  - c. Meike Fenster gucken  
Meike window look-INF  
(Meike guckt aus dem Fenster.)  
'Meike is looking out the window.'

Analyses of children's Root Defaults (RDs) fall into two categories corresponding to the Strong or Weak Continuity hypotheses. Strong Continuity approaches such as Hyams' (1992) and Poeppel and Wexler's (1993) assume a full syntactic structure, with all the functional projections. Such approaches emphasize the conformity of early child grammars with Universal Grammar and assume that functional projections below and including CP are present at early stages of development. The explanation for the existence of RDs cannot then involve reduced structure.

On the other hand, Weak Continuity approaches assume that RDs represent a

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<sup>6</sup> To assist interpretation for the non-German reader, the assumed adult/target colloquial German translation is provided in the third line in all examples.

## Universal minimal structure

grammar involving only a VP projection,<sup>7</sup> as already mentioned (recall the tree in (1)).

The most radical weak continuity account of children's RDs is found in Rohrbacher and Vainikka (1994). Their structure building approach assumes that RDs in German and Swedish reveal the nature of early grammars as bare VPs upon which functional structure is then subsequently built up in response to primary linguistic data. This is the general approach we adopt here.

One of the most important arguments for the presence of more than a VP in early grammars comes from semantic analyses of Root Defaults. These studies attempt to show – based on the 1992 proposal of Boser, Lust, Santelman and Whitman – that RDs rather than being declarative sentences in the early L1 data instead contain null modals. However, in a recent comprehension study, Orfitelli and Hyams (2008) report on a study that calls this conclusion into question. In their study, the children were given imperative sentences that made up a truth-value judgment task. These could either be interpreted as imperatives (= an adult grammar), or as Root Default-type declaratives, with missing subjects and bare verbs. The results showed that children aged 2;6-3;5 interpreted the sentences as declaratives, with children older than 3;6 categorically changing to the adult-like imperative interpretation. This supports the approach that RDs in children's L1 English are not simply missing certain elements but involve a different grammar in comparison to the adult grammar.

If we treat imperatives as involving less structure (such as a VP) than indicative statements (TP), Orfitelli and Hyams' results can be thought of as follows. When young children (under 3 ½) learning English are presented with an adult reduced structure (imperative), they treat it as indicative, perhaps the more common clause type, or at least

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<sup>7</sup> Under the VP-analysis, Root Default subjects such as 'Meike' in (5c) occupy the Spec,VP position, the standard base-generated position for subjects even in the adult target syntax (Koopman & Sportiche 1991); we return to the status of the functional projection vP in Section 5.2.

## Universal minimal structure

pragmatically more plausible in a testing situation. This supports the idea that children's indicatives can involve only a VP projection. After age 3 ½, the children have acquired the IP-level functional projections, and a structure without IP-elements would now be treated as a VP, resulting in the adult imperative reading.

While there has been a general consensus in L1 acquisition that Root Defaults are neither attested in languages with rich inflection nor in null subject languages (see e.g. Phillips 1995; Wexler 1998), this conclusion appears to be premature. As already mentioned above, recent data from Spanish Russian, both languages with rich inflection, show Root Defaults.

We now turn to Root Defaults in L2 acquisition; as discussed above, it is these data - in particular the naturalistic adult data which we concentrate on - which reveal the need for an acquisition mechanism for functional projections *not* involving biological maturation.

### 3. Root Defaults in second language acquisition

A maturational account of Root Defaults would *a priori* rule them out in second language acquisition. However, under UG-driven second language acquisition, we expect RDs to occur in much the same manner as they do in first language acquisition. Early discussion of RDs in the L2 acquisition is found in Clahsen (1988) on German, but the topic has until fairly recently received relatively little attention. Accounts of RDs in second language acquisition (under approaches that assume lifelong access to UG) roughly parallel those accounts in first language acquisition, with Weak and Strong Continuity analyses debated along the same lines as in L1 acquisition.

The following competing proposals have been made for RDs in L2 acquisition: (i)

## Universal minimal structure

only a bare VP projection is involved (Vainikka & Young-Scholten 1994; see also Prévost & White 2000 a/b/c and Prévost 2003) or (ii) the full syntactic tree is always projected, but due to non-syntactic factors such as processing, grammatical morphemes may be omitted (Epstein, Flynn & Martohardjono 1996; Haznedar & Schwartz 1997; Lardiere, 1998, 2003; Schwartz & Sprouse, 1996).

Prévost and White's (2000a/b/c) position is based on their analysis of L2 data from children and adults, and they consider two analyses of RDs: Rizzi's (1993/4) Truncation Hypothesis (that is, RDs as bare VPs) and the Missing Surface Inflection Hypothesis (Haznedar & Schwartz, 1997; Lardiere 1998, 2003). The latter falls under the Strong Continuity category: a full syntactic tree is always projected, and inflection may be omitted due to non-syntactic factors. Prévost and White conclude that Truncation applies in child L2 acquisition, but that adult L2 acquisition involves missing surface inflection. The second part of this conclusion will be challenged below.

Child L2 acquisition typically proceeds at fairly fast rate, with development often on par with – or even faster than – typical L1 acquisition. From a methodological standpoint, the older L2 child's phonological, cognitive and social development conspire to render data easier to collect and analyze such that any RDs can be detected more readily than in the L1 acquisition data. In contrast to child L2 acquisition, L2 data from socially excluded adult immigrants who receive no instruction in the L2 but only minimal naturalistic input reveal exceedingly slow development, as in the data from the well-studied population of migrant workers in Europe (e.g. Clahsen, Meisel & Pienemann 1983 on the ZISA study; Klein & Perdue 1997 on the ESF study). Because of the continued suspicion that youth may confer an advantage, we now continue the discussion of RDs in child and adult second language acquisition separately.

### 3.1 Root Defaults in child second language acquisition

In comparison with older L2 learners, data collection from young L2 learners faces certain difficulties. To begin with, the initial period of L2 exposure is often characterized by a 'silent period' (see e.g. Krashen 1985). When children's reticence results in data collection commencing after several months of immersion in the target language have elapsed, the researcher cannot claim to have captured early development. Studies since the 1980s such as Haznedar's (1997) have acknowledged the desirability - and demonstrate the feasibility - of collecting oral production data prior to the multi-word point. When data are collected sufficiently early, evidence of reduced structures can be found in child L2 acquisition, as in Prévost's (1997) discussion of data from child L2 German (see also Prévost 2003). The data come from Pienemann's (1981) 62-week study of three eight-year-old Italian-speaking learners of German who were attending a German preparatory class but had limited contact with German children in school. Until week 12, the two of the three children whose data Prévost considers produced mostly single-word utterances. Prévost argues that children's subsequent early multi-word utterances such as those in (6) represent the same sort of truncation found in the L1 acquisition of German.

- |     |    |                                                    |                        |
|-----|----|----------------------------------------------------|------------------------|
| (6) | a. | Nicht lesen<br>not read-INF                        | (Concetta, month 12.4) |
|     | b. | Hier gucken der Geld<br>here look+at-INF the money | (Concetta, month 13.5) |
|     | c. | Gehen in die Schule<br>go-INF to n the school      | (Luigina, month 19.7)  |

Together with White (Prévost & White 2000a/b/c), Prévost takes the position that child L2 acquisition involves a tight coupling of syntax and morphology, where the Truncation

## Universal minimal structure

Hypothesis applies as they assume it does in child L1 acquisition. The data on which this conclusion is based come from two children learning French (English L1) and two children learning German (Italian L1). Perhaps 90% of the child L2 non-finite data support or are consistent with a grammar characterized by RDs: non-finite forms follow negation and do not occur in CP constructions, RDs do not occur with auxiliaries or modals, nor do they occur with (L2 French) subject clitics.<sup>8</sup> Moreover, RDs disappear when null subjects disappear. We agree that Prévost and White's data show RDs with reduced structure for child L2 learners, but take issue with their conclusions about the L2 adults. We return to these data further below.

Data from a Turkish-speaking child, Erdem, acquiring English has been used to argue against an early RD stage in child L2 acquisition (Haznedar & Schwartz 1997; see also White 2003:188). Unlike English L1 children, Erdem exhibits correct subject case marking and near absence of null subjects despite their existence in his L1. However, a comparison of Erdem's data with the L1 English data reported in Powers (1995) and in Vainikka (1993/4) points to no real L1 – L2 differences when we consider that some but not all L1 English children produce oblique (non-adult) subject pronouns. Furthermore, prior to the twelfth data collection session, subjects are not obligatory for Erdem. It is from this session that null subjects nearly disappear, and English-like IP-related elements emerge, suggesting development of functional projections.

Further evidence for a stage involving just a bare VP in child L2 English comes from Yamada-Yamamoto's (1993) longitudinal study of a Japanese 3-year-old boy, Jun. After 19 months of exposure to English, Jun switches the headedness of the VP from the Japanese head-final order to the English head-initial order, a pattern we will discuss in

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<sup>8</sup> In various child L2 studies, RDs generally pattern similarly to L1 acquisition in terms of verb placement (finite verbs raised, RDs'original position), e.g. Ionin and Wexler (2002), and Prévost (2003). However, Tran (2005) reports cases of RDs in a raised position in child L2 German, albeit in a foreign language classroom context.

## Universal minimal structure

more detail in the next section on adults. In (7) are typical examples of declarative sentences (from a picture description task) produced by Jun before he switches headedness, i.e. before 19 months have elapsed (note that the RD form even in L1 English is either the bare form or the *-ing* form) and in (8) are typical examples (from the same task) after 19 months:

- (7) a. bread eat  
b. bananas eating
- (8) a. eating banana  
b. wash your hand

Even after the VP has switched to the target head-initial English order, Jun's declarative sentences appear to consist of a bare VP projection, given the lack of tense or agreement morphology, along with the missing subject NPs shown in (8).

Our point here is not that L1A and (child) L2A are necessarily identical in all respects, but that in child L2 acquisition – as in L1 acquisition – there is evidence of a stage with Root Defaults.. Furthermore, since the L2 children studied have typically already acquired their first language prior to being exposed to the second, a biological maturation explanation is not feasible for their bare VP structures. The data from adult L2 acquisition make the same point even more clearly.

### 3.2 RDs in adult second language acquisition

Various methodological challenges also present themselves in adult L2 acquisition research. In a classroom context these include the tendency for early production of functional morphology to involve unanalyzed chunks (Myles 2004, 2005). Although it is far from straightforward to determine when an utterance represents the acquisition of

## Universal minimal structure

underlying structure and when it is simply a memorized chunk, the researcher must attempt to do so lest s/he conclude that the learner's grammar is more advanced than is warranted. The researcher wishing to compare the morphosyntactic development of L2 children and adults is therefore well advised to look at learners for whom the classroom is not the source or main source of input, namely immigrants. However, recall from the discussion above that some of the best known data from such learners come from adults who due to social exclusion receive little input from native speakers of the target language. But rather than compromise analysis, because acquisition proceeds relatively slowly for such learners, the data collected have the potential to shed additional light on the early stages of what we take to be UG-constrained acquisition.

And indeed, in so-called naturalistic L2 acquisition, an early stage in L2 German can be found where Root Defaults predominate: subjects are optional, modals and auxiliaries are absent, and tense or agreement marking do not yet occur - that is, a stage similar to the least advanced L1 acquisition data. For example, Dimroth's (2002) cross-sectional study of 40 adult immigrants in Germany (31 Russian, three Croatian and six Turkish speakers) strongly points to eight of them being at an early stage involving just a bare VP projection, since they used non-finite verbs 90% of the time (either with the L1 word order, or with the target German word order). Similar cross-sectional data from naturalistic immigrant adults are discussed in Vainikka and Young-Scholten (1994) where, for example, 95% of Aysel's (Turkish L1) main verbs occurred in a non-finite (RD) form, subjects were optional and modals, auxiliaries, tense and agreement were not productively used; two of the other learners, Memduh (Turkish L1) and Changsu (Korean L1), also showed high proportions of non-finite verbs and optional subjects. For all three learners, there is also little evidence of verb raising and a complete lack of the complex syntax associated with functional projections.

## Universal minimal structure

Similarly, the early L2 German files from the longitudinal ZISA study for Jose (Spanish L1) and Salvatore (Italian L1) show main verb RDs 80-90% of the time without modals, auxiliaries, tense or agreement (Vainikka & Young-Scholten 1996). Consider the early RD examples in (9), from the longitudinal as well as the cross-sectional ZISA learners and the cross-sectional LexLern study learners (Vainikka & Young-Scholten 1994, 1996):

- (9) a. ja alles hier kaufen (Memduh/Turkish)  
yes everything here buy-INF  
(Ja, ich kaufe hier alles.)  
'Yes, (I) buy everything here.'
- b. hier jacke ausmachen (Changsu/Korean)  
here jacket off.make-INF  
(Sie macht (zieht) ihre Jacke aus.)  
'(She) is taking (her) jacket off here'
- (10) a. vielleicht schule essen (Salvatore 6/Italian)  
maybe school eat-INF  
(Vielleicht isst sie auf der Schule.)  
'Maybe he/she eats at school.'
- b. mehr deutsche lerne<sup>9</sup> (Maria/Spanish)  
more German learn-1SG/INF  
(Ich lerne mehr Deutsch.)  
'(I) learn more German.'
- c. diese hier tür zumache (Antonio/Spanish)  
this here door close-1SG/INF  
(Diese Person macht hier die Tür zu.)  
'This (person) here closes the door.'

The RDs of Turkish and Korean speakers' whose basic L1 word order is SOV virtually always occur in (S) OV order, as in (9). Spanish and Italian speakers' (whose L1s are SVO) earliest RDs are (S)VO. Somewhat later, Spanish and Italian speakers switch VP

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<sup>9</sup> We take forms with the –e suffix to correspond to infinitivals for some of the Romance L1 speakers; this form of the infinitive is also found in some varieties of German, though not the varieties spoken where these learners resided..

## Universal minimal structure

headedness resulting in (S)OV Root Defaults in German, as in (10). These utterances occur at a point in data collection where there is still little evidence of any functional projections apart from some nominal morphemes such as the article *eine* 'a' and adverbials such as negation. Vainikka and Young-Scholten (1994, 1996) argue that these represent either a bare VP stage or a stage at which the first functional projection, NegP, is being acquired. Jose, who was employed as a waiter and received relatively more input than the other learners, shows development of functional and grammatical elements in his later files.

Recall discussion of Prévost and White's (2000a/b/c) analysis of child L2 data with reduced structures. They also considered data from four adults learning either French (Moroccan Arabic L1) or German (Romance L1) naturalistically, under informal circumstances, and they claim that the non-finite forms that these learners produced are explained by the Missing Surface Inflection Hypothesis and not by the Truncation that explains the child L2 data. However, the data from the individual learners point to an analysis other than simple absence of surface inflection. The examples in (11) from Prévost & White (2000c) show use by adults of non-finite verb forms in what might be finite contexts similar to those described for the L2 children.<sup>10</sup>

- (11) a. für nehmen (Ana, month 4)  
for take-INF
- b. ich weiss nich machen (Zita, month 11.7)  
I know not make-INF

By looking at the individual adults more closely, we find coupling of morphology and syntax similar to the L2 children's. For example, Arabic L1/French L2 Abdelmalek

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<sup>10</sup> The authors do not provide likely target utterances in the L2 here. It is possible that (11b) involves embedding a bare VP that can sometimes be observed in L1 acquisition, as well. Given that we do not maintain a requirement that all embedded clauses are always CPs (any more than all questions being CPs, Section 1.3), embedding of reduced structures is possible.

## Universal minimal structure

exhibits the same correlation with respect to negation and verb form as do the L2 children: negation precedes uninflected verb forms (86% of the time), and follows inflected verb forms (92% of the time). Moreover, 25% of non-finite verbs lack a subject, while only 8% of finite verbs do. Similar to the L2 children as well as to the other three L2 adults, Abdelmalek does not produce otherwise reduced structures with auxiliaries or modals. Although his data collection began after he had been in France for 14 months, there is still a shift apparent after 32 months of French exposure when his RD production reduces from 36% to 20%, and null subjects from 11% to 4% overall. While we are not in a position to determine whether these changes in the data are statistically significant, it is revealing that such grammatical patterns can be found.

Ana, a Spanish learner of German, most closely resembles the L2 children in her low proportion of non-finite verbs. Her acquisition is faster than Abdelmalek's, very likely due having a German boyfriend. However, she also exhibits non-target production of German where the relationship between morphology and syntax deviates from that of the children, as exemplified in (12). It is this type of data that causes Prévost & White to invoke the Missing Surface Inflection Hypothesis/MSIH for adults, in contrast to the child L2 analysis. Based on the data on which Prévost and White report, we estimate these types of examples to account for about 10% of the data. These show adults' use of finite<sup>11</sup> and non-finite forms which can be attributed to Missing Surface Inflection:

- (12) a. il faut marche (Abdelmalek, month 36.7)  
it must walk-1/2/3S
- 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

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<sup>11</sup> But see footnote 9; it is not clear that these are indeed finite forms.

## Universal minimal structure

We follow Prévost (2003), who proposes that *both* Truncation and Missing Surface Inflection are at play in the adult L2 data. For these four adults, this would mean that, in addition to the possibility of reduced structure, there is an additional performance factor (corresponding to what might be MSIH examples in (12)) that would account for roughly 10% of the data.

While we have concentrated on immigrant adults learning a second language naturalistically, data from Myles (2005) suggest that a bare VP stage can also be observed in classroom settings. Myles collected longitudinal data from 14 English-speaking adolescents (aged 12-13) learning French as a foreign language. Data collection involved two sessions, the first after 141 hours of instruction, the second after 254 hours. Adopting a structure building approach, Myles argues for a very early stage with no sentential projections at all. VP is only projected - by most speakers - by the second recording. Where VP is not projected early on, utterances involve a bare NP or PP. The proportion of finite verbs and auxiliaries produced increases over the two sessions, and even an IP projection is evident for some of the learners during the second data collection session.

The data reviewed here from L2 learners show an early stage with Root Defaults representing the predominant construction, and with few if any grammatical morphemes – regardless of age. It appears that there are L2 grammars without any functional projections. In later data, functional projections can be seen to develop one by one, as most clearly shown in Vainikka and Young-Scholten (2011). Thus, we submit that there is a bare VP stage in L2 acquisition, and that a mechanism for developing functional projections is required that does not invoke biological maturation.

The aim of the next section is to provide an overview of relevant studies in atypical L1 acquisition to pursue the idea that all early grammars involve reduced,

Universal minimal structure

minimal structure, which then entails a general mechanism for developing functional projections.

#### 4. Atypical L1 development and the bare VP stage

Our claim here is that both children and adults have access to a component of UG that is responsible for the development of functional projections. This means that the mechanism for acquiring specific functional projections is not subject to a critical period). However, even under this approach there is room for child-adult differences in terms of the availability of triggers in the input such that *affixes* appear to act as triggers for children's projection of functional syntax, while *free morphemes* may be more likely to do so for adults. (See Sakus & Fodor 2006 on triggers.)

We will see in this section that the exceptional circumstances under which children receive considerably less input than normal, or where various cognitive problems exist which can lead to protracted development, present the clearest evidence of reduced structures.<sup>12</sup> Children for whom input was either limited or non-existent during the hypothesized critical period (Lenneberg 1967) present a potentially clear case, corresponding to the adult L2 data presented above. Less clear are studies of children for whom the processing of input is compromised in some fashion, either due to general cognitive impairment or specific language impairment, whose etiology is congenital or due to childhood cerebral insult. The studies we discuss are summarized in Table 1:

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<sup>12</sup> Because the term 'delay' can imply impairment (see e.g. Bishop & Mogford 1988) and we wish to remain agnostic regarding causes of slow L1 development, the more neutral term 'protracted' is instead used here.

**Table 1. First language acquisition in exceptional circumstances**

Situation	Study	Child's age during relevant period of observation
Lack of input	i. <i>Genie</i> (Curtiss 1982; Fromkin et al. 1974) ii. <i>Kaspar Hauser</i> (Louden 1999)	ca. 14 years old  adolescence
Lack of easily usable input	i. <i>oral language of deaf individuals</i> (McGuckian & Henry 2003) ii. <i>home sign</i> (Goldin-Meadow & Mylander 1990)	2;11 to 3;6  1;4 to 4;1
Cognitive impairment	i. <i>Down syndrome</i> (Thordardottir et al. 2002) ii. <i>children with hemispherectomies</i> (Curtiss & de Bode 2001; Curtiss & Schaeffer 1997) iii. <i>Specific Language Impairment</i> (Hamann et al. 1998; Leonard 2000; Letts 1993; Lindner 2002; Wexler et al. 1998)	childhood; adolescence  childhood  4 to 7 years old

#### 4.1. Complete lack of input during the critical period: Genie and Kaspar Hauser

Genie's history is well known (see e.g. Curtiss 1982; Fromkin, Krashen, Curtiss, Rigler & Rigler 1974), and we omit details to focus solely on her early development of morphosyntax. With considerable exposure to English, some eight months after her emergence from extreme deprivation in November 1970, young adolescent Genie began to string single words together; verbs were initially absent from these utterances. Two months later, verbs began to be included, and two months after this (November 1971), three- to four-word utterances began to be produced, with a fixed SVO word order. In February 1972, Genie produced her first negated utterance, *no more*; a comprehension test showed Genie had understood the distinction between negation and affirmation a month earlier. In July of that year, she began to use two-verb utterances such as *want go shopping* and *like chew meat*. Around this time *-ing* was being added to verbs where

## Universal minimal structure

on-going action was indeed referred to, as in *Genie laughing*; however, the *-ing* suffix was not used consistently or unambiguously to point to its use in marking progressive aspect. Genie's production at the time was missing subordinating conjunctions, complementizers, tense markers and constructions involving movement. Passives were absent in her production, and in a passive/active act-out task, where two- to three-year children learning English typically respond correctly to actives but randomly to passives, Genie responded randomly to both. Question words were also missing, and although Genie is reported to have responded correctly to WH-questions, she may have simply been distinguishing between the various WH-words' meanings.

It therefore appears that Genie's utterances at this point represented reduced structure: omission of tense markers indicates non-projection of TP, omission of subjects and auxiliary verbs (and agreement marking) indicates further non-projection of an IP-level projection such as AgrP, and missing conjunctions, complementizers and question words indicate a missing CP projection. Overgeneralization of *-ing* along with use of the bare stem of the verb reveal the presence of Root Defaults, consistent with a bare VP grammar without functional projections. Genie's use of the negative construction (after about a year of exposure) may involve her first functional projection, NegP.

Kaspar Hauser's case is similar to Genie's, although his re-emergence is not as exhaustively documented as hers. He was discovered in Germany as an adolescent whose mental age was judged to be that of a three- to four-year-old, the age from which he was reported to have been imprisoned. According to Loudon (1999), the notes from Kaspar's first teacher post-emergence are consistent with characteristics of early L1 German (see Clahsen 1991): subjectless clauses (contrary to adult German), non-finite verbs/stems in final position in declarative clauses, and absent copula, modals, auxiliaries and complementizers. The data indicate lack of IP and CP projections. Non-

## Universal minimal structure

finite verbs (or stems) in final position in declarative clauses, again, point to lack of verb raising and reveal the presence of RDs in Kaspar's early post-emergence data.

Both Genie's and Kaspar Hauser's utterances point to a stage characterized by Root Defaults for first language learners who are well past the age at which finite clauses would have to mature (if maturation were assumed). However, one might speculate that a mechanism for acquiring functional projections atrophied for Genie and Kaspar Hauser, due to their lack of input during the critical period. This turns out not to be quite right: there is some evidence of functional projections emerging over time for both late L1 learners, albeit less so for Genie. Genie's early data indicate that for more than a year after her initial exposure to regular linguistic input, in November 1970 her grammar, showed no evidence of functional projections (apart from the possible NegP). Between February and July 1972, the first functional projection beyond the VP (or NegP) appeared to be emerging. Kaspar Hauser's developmental trajectory resembled Genie's, yet reports indicate that he eventually acquired the adult language of the community, while Genie did not (see Curtiss 1982). Genie's acquisition plateaued at a stage whose grammar is best described as just post-VP. The difference between the two post-puberty L1 learners hinges on a reported developmental hiatus for Kaspar Hauser at his age of imprisonment, where input deprivation commenced around age three or four.<sup>13</sup> In Genie's case, there seems to have been input deprivation from her first year of life.

### 4.2 Little usable input

The oral language of prelinguistically deaf children also reveal a lack of functional

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<sup>13</sup> Apparently Kaspar Hauser's language production at the time of discovery corresponded to that of a two-

## Universal minimal structure

projections at the earliest stage. Here we restrict discussion to the acquisition of *oral* language by deaf individuals without exposure to sign language users; acquisition of a sign language falls under typical L1 acquisition. In particular, such children's word order has been found to be rigid, with only simple, active declarative structures and few conjunctions, pronouns or function words (Mogford 1993). McGuckian and Henry (2003) compared oral English production data from five 35- to 42-month-old deaf children with no sign language exposure to data from hearing children learning English as an L1 and L2. They concluded that these deaf children pattern like L2 children in their oral English development, pointing out that - similar to L2 children - deaf children often experience restricted input leading to protracted development. The development of these children's suffixes followed a pattern mirroring that found in Dulay and Burt's (1973) study of L2 children's common (regardless of L1) production of INFL-related elements in English: copula > auxiliary > tense > agreement.

Another study of deaf children without sign language exposure is Goldin-Meadow and Mylander's (1993). They asked whether the communicative gestures ten children were observed to use communicatively constituted a grammar. The children's ages were 1;4 to 4;1 at the first interview and 2;6 to 5;9 at the final one. The 'homesign' system children developed involved two-gesture utterances with the following order and constituents: *patient-act* (e.g. 'cheese eat'); *patient-recipient* (e.g. 'hat head'); *act-recipient* (e.g. 'move-to table'). The authors note that the probability of a patient argument to be included in a two-gesture utterance was higher than the probability of including an actor; this suggests a bare VP stage. While six of the older children produced complex utterances from the start of data collection, suggesting a more advanced stage of development, the other four children only began producing complex

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year-old, rather than a three- to four-year-old. One interpretation is (partial) attrition during imprisonment.

## Universal minimal structure

utterances during the study, indicating the emergence of functional projections. For example, their (gestural) morphology underwent development in grammatical marking of predicate transitivity vs. intransitivity. This is important because, in contrast to typical L1 or L2 acquisition, children who develop homesign lack input containing information about functional projections. Goldin-Meadow and Mylander's analysis of hearing family members' gestures as paralinguistic rather than linguistic rules out any such possibility. Even in the total absence of evidence for functional projections, UG allows operation of the acquisition mechanism for functional projections, by providing children with default information for various projections. While this is possible for one- to five-year olds, who are still well within the critical period, this was, not possible for adolescent Genie despite considerable input. (See discussion below on Newport's 1990 'use it or lose it' hypothesis.)

The genesis of Nicaraguan Sign Language reveals that homesigners indeed differ from those who receive linguistic input (Kegl 1994; Senghas, Kita & Özyürek 2004). Created by its first-generation users without sign language input, this sign language emerged in a situation which began presumably began much like that of the homesigners studied by Goldin-Meadow and Mylander. An actual sign language began to develop when previously isolated older deaf children and adolescents came together in newly established schools and vocational centers. In their study of this emerging sign language, Kegl as well as Senghas et al. find evidence of persistent reduced structure in the sign language of the first-generation signers when compared with younger, second-generation signers whose input was the first-generation sign language users' output. The older first-generation signers used iconic, combined motion verb gestures, which can be analyzed as RDs with a bare VP structure. Second-generation signers, on the other hand, used sequential motion gestures (Senghas et al. 2004) indicating the

Universal minimal structure

existence of functional projections.

### **4.3 Cognitive and linguistic impairment**

In this section, we provide a very brief discussion of Root Defaults where both cognitive and linguistic abilities are affected (children with Down syndrome and children with hemispherectomies) and where only linguistic abilities seem to be affected (Specific Language Impairment/SLI). While much work has been done on acquisition by SLI individuals, our goal here is simply to assess the possibility of a bare VP stage in such learners.

In a study of 24 older Down syndrome children and adolescents Thordardottir, Chapman and Wagner (2002) consider their limited use of complex syntax and absence of grammatical morphemes, pointing to Root Defaults. They also argue that morpho-syntactic development by Down syndrome individuals continues into puberty, as would be expected under a view in which UG remains in operation throughout the lifespan. Since the general acquisition mechanism in UG for functional projections that we have discussed cannot be based on maturation, the pattern of development that we would expect is consistent with what Thordardottir et al. find for Down syndrome individuals. Root Defaults indicate a bare VP structure, and later morphosyntactic development suggests development of functional projections.

Curtiss and de Bode (2001; see also Curtiss & Schaeffer 1997) discuss data from children who have undergone hemispherectomies, and they refer to a 'so-called RI [Root Infinitive] stage' (2001:206) at which some of the children can be placed. These children's production was characterized by Root Defaults. In their data from some children indicate presence of an IP and CP post-surgery. To the extent that these

## Universal minimal structure

children can later develop functional projections, valuable information could be garnered in terms of the neurological correlates of the acquisition mechanism for functional projections.

With respect to the congenital deficit held to spare general cognition while affecting language, namely Specific Language Impairment, Wexler, Schütze and Rice (1998) argue for an extended Optional Infinitive stage. On the basis of data from SLI children aged 4;9 to 5;5, they describe a stage during which only a VP is often projected, i.e. Root Defaults are possible. At this stage, Tense and Agreement are optional, resulting in non-finite main verbs and oblique subjects, e.g. *him run* and *her watching tv*. There is also a delay in children's acquisition of grammatical constructions such as passives, binding and negative questions. (Recall that these researchers assume that maturation is at the heart of the stage with Root Defaults, and maturation of SLI children is just assumed to be slower than that of non-SLI children.)

Revealing similar evidence for Root Defaults is Letts' (1993) longitudinal study of an English-speaking SLI child. At the start of data collection at age 4;1 the young boy's utterances were short and often subjectless (e.g. *catch a fish* and involved omission of auxiliaries (e.g. *he eating*) as well as tense marking and complementizers. At the sentential level the boy's earliest production data suggest a grammar consisting of a bare VP projection, with functional projections lacking. At age 5;6 an IP-level functional projection was observed to be emerging, evidence for which were (not always correct) auxiliaries, the first stirrings of tense marking, but with continued subject omission. By age 7;0 he had mastered past tense as well as embedded clauses, pointing to the projection of CP.

The occurrence of Root Defaults in the SLI data from various languages is somewhat controversial. According to Jakubowicz and Tuller (2008), Root Defaults are

## Universal minimal structure

rare in French SLI. However, work by Paradis and colleagues (e.g. Paradis, Rice, Crago and Marquis 2008) points to the existence of RDs in French SLI, in particular in the bilingual population. Leonard's (2000) cross-linguistic overview of SLI reveals presence of RDs not only in English but also in Hebrew, Italian and Spanish. All SLI children manifested problems with agreement and tense, although English agreement presented the greatest challenge. When morphemes were produced by the children, they were usually appropriate, although over-regularizing of verbal morphology was typical.

### **4.4 German SLI**

As has been the case in the study of typical L1 acquisition, German has been a fruitful language for linguists studying atypical development. Accordingly, Hamann, Penner and Lindner (1998) provide an insightful analysis of data from 50 German SLI children. Their data show a missing CP projection, resulting in absence of WH-questions, omission of WH-words in questions and omission of (obligatory) complementizers in embedded clauses. The data also provide evidence for an AspP and a TP, with the main verb (marked either finite or non-finite) often incorrectly positioned at the end of the clause. The authors reject the Truncation Hypothesis to account for the data, and instead posit a Minimal Default Grammar involving an underspecified merger (Chomsky 1995; Penner & Roeper 1998; Roeper 1996), where the functional and categorical features of the CP (and perhaps other functional projections) are suppressed. While we concur with the conclusion that CP is lacking, it is difficult to evaluate Hamann et al.'s proposal in terms of specific stages of development due to the grouping of data from many children.

Similar to typically developing children learning German (Clahsen 1991), most SLI German children's non-finite verbs are utterance-final. However, some of the non-

## Universal minimal structure

finite verbs in the SLI data occur in the raised (second) position. Furthermore, unlike both typically developing children and L2 learning adults, who posit a head-initial functional projection in German early on, the SLI children produce both finite thematic verb forms and non-finite modals and auxiliaries in final position, as shown in this example from Lindner (2002):

- (13) Wir das Hexenbücher noch nicht angeschaut haben. (5;5 year old)  
we the witch-books yet not at-look have-1PL  
(Wir haben die Hexenbücher noch nicht angeschaut.)  
'We haven't yet looked at the books about witches.'

Examples of this type indicate that German SLI children have difficulties with the mixed headedness of German syntactic projections, where according to the standard analysis of German syntax the VP is head-final, the CP is head-initial, and the intermediate IP-level projections are assumed to be head-final. In typical German L1 acquisition (and in naturalistic child and adult L2 acquisition) such a general pattern has not been attested. Regardless of the resolution of the question of the headedness functional projections, an early RD stage has been identified in Lindner's data.

Lindner's case study of three German SLI children reveals patterns similar to Hamann et al.'s children. Data from children's free conversation and description of events point to grammars that share characteristics with both typically developing children's and L2 adult learners' grammars, but which also display features associated with neither. The oldest of the three children, a 6;8 year-old boy, showed clear evidence of RDs, where 81% of his utterances consisted of non-finite verbs in final position and overall contained few functional elements or WH-questions. For the other two children (girls aged 4;9 and 5;5) in 47-63% of the declarative clauses they produced, the verb was non-finite. While the two girls produced some WH-questions and embedded clauses, none were target-like. Most of the utterances produced by the three children

## Universal minimal structure

can be analyzed as RDs, pointing to non-projection of (at least) the CP projection. In

Table 2, their data are summarized:

**Table 2 The German SLI children studied by Lindner (2002)**

Child	Utterances with non-finite forms	Utterances with non-finite forms in higher position	Utterances with finite forms in higher position	Other non-adult characteristics
Boy 6;8	81%	2%	6%	Few functional elements; difficulty with WH-Qs
Girl 4;9	63%	9%	23%	Little use of auxiliaries; agreement paradigm not yet complete; difficulty with WH-Qs
Girl 5;5	47%	0%	40%	Difficulty with WH-Qs

We can place each child in Lindner's study at a different stage based on presence of functional elements and related syntax. The oldest child (a boy) appears to represent the earliest bare VP stage of syntactic development. The data from the 4;9-year-old girl suggest that she is in the process of acquiring an IP-level functional projection (similarly to much of the early German L1 data). The most advanced child has acquired the IP-level projections of German, but has not yet fully acquired the CP projection. Lindner remarks that while the more advanced girl shows some evidence of a CP projection, a CP cannot be assumed at all for the other girl and for the boy.

Since the German SLI data we have discussed are not longitudinal, the stages of development are hypothetical. However, as we saw above in Letts (1993), the longitudinal data from English SLI showed an early RD stage, followed by the

## Universal minimal structure

development of grammatical elements that can be associated with the development of specific projections.

### 4.5 Summary of the atypical L1 studies

We have seen that there is evidence for an early Root Default stage in various atypical acquisition situations; these data are summarized in Table 3. Based on the argumentation presented in the theoretical discussion in Section 1, we claim that each of these early RD stage grammars is represented by a bare VP projection. (Note that the table only includes features mentioned by authors.)

**Table 3 Summary: morphosyntax at the RD stage of exceptional L1A**

study/child	<i>morphology</i>	<i>syntax</i>
Genie	no tense	invariant SVO order; complementizers absent; question words absent; passives absent; no movement
Kaspar Hauser	non-finite verbs; no modals; no copula	SOV order; complementizers absent; subjects not obligatory
oral language of deaf children	few pronouns; few function words	rigid SVO order; passives absent; few conjunctions
home sign users	-	OV utterances preferred; subjects not obligatory
children with Down syndrome	functional elements absent	-
children with hemispherectomies	non-finite verbs	-

children with SLI	non-finite verbs; no agreement; no tense; subjects not obligatory; non-nominative subject forms	SOV (for German); WH-questions absent; complementizers absent; passives absent
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## 5. Discussion

### 5.1 The universal VP-stage

Operating under the now (since at least White 1989) widely-held assumption by generative second language acquisitionists that adult L2 learners' syntactic development is UG-constrained, data from such learners showing the presence of reduced structures similar to L1 and L2 children's constitutes additional evidence for the post-puberty operation of UG. All language learners appear to begin at this universal early stage.

We have referred to a range of studies of first language learners for whom the input was compromised due to cognitive or intake channel problems. These circumstances give rise to protracted production of Root Defaults (Root Infinitives), or in structure building terms, result in a considerably longer VP stage than what is found for typically developing L1 children.

In L2 acquisition by immigrant adults, there is often a problem with sufficient input, resulting in a situation where the bare VP stage may constitute the end (fossilized) steady state of acquisition. It is unsurprising that oral production data collected in a foreign language classroom point to a bare VP stage (Myles 2005, discussed above), given the minimal amount of time usually devoted to foreign language study.. Yet, fossilization at the bare VP in adult L2 acquisition is not a given. When one tracks the

## Universal minimal structure

morpho-syntactic development of post-puberty L2 learners in an input-rich environment (e.g. living with a host family and attending a secondary school as an exchange student), one finds evidence of rapid progress well beyond the bare VP stage to the projection of a CP, even within a year (Vainikka & Young-Scholten 2002, 2011).

Meagre L2 exposure in circumstances that are typical for adult learners may contribute in part to explaining a protracted VP stage. We cannot, however, ignore initial age of exposure. If we maintain that UG constrains language acquisition throughout the lifespan in exactly the same way, we would expect the first generation Nicaraguan Sign Language users to have developed their sign language further when exposure increased, when contact finally took place with other users. Yet the sign language of those with post-puberty contact with other users can be said to resemble a pidgin rather than a fully-fledged language.

The rare cases of extreme deprivation such as Genie's seem to indicate that in order to remain available, UG must become active in first language acquisition during the critical period (see Newport 1990). Further support for the 'use it or lose it' position comes from Thordardottir et al.'s (2002) study of Down syndrome individuals. One of Lenneberg's (1967) arguments for termination of the critical period at puberty was the alleged cessation of linguistic development in Down syndrome around then. However, Thordardottir et al. provide evidence against this conclusion, pointing out that these individuals maintain their slow pace of acquisition throughout puberty, and they find evidence for plateaus relating to syntactic complexity rather than evidence for a syntax vs. morphology lag, the latter of which would point to Missing Surface Inflection.

## **5.2 Preliminary thoughts on the acquisition mechanism**

## Universal minimal structure

If the acquisition of sentences begins with the lexical projection VP, how might functional projections be acquired? The idea we pursue is that Universal Grammar organizes functional projections into three groups: the VP-group, the IP-group (alternatively, the TP-group), and the CP-group, in this order. For each group, there is a set of possible grammatical features that can be realized as specific functional projections, if the input provides evidence for it. If there is no evidence in the input (or the language learner cannot find it), the projection is not posited.

The possible VP-related features/projections might involve the following – the features/functional heads are presumably ordered, although we do not claim to have the correct order here:

- 14a) [+/-] Accusative (or Absolutive)
- b) [+/-] Object Clitic
- c) [+/-] Object Agreement
- d) [+/-progressive] AspectP
- e) [+/- negation] NegP
- f) [+/- passive] VoiceP
- g) vP

The first three projections deal with the object argument, and are posited only if there is evidence in the input. An Aspect Phrase is posited if an aspectual contrast can be identified on (or near) the main verb or VP. A Negation Phrase is posited at this point, low in the structure, if sentential negation occurs next to the VP, otherwise not (in which case it ends up being posited later – see below). Similarly, if passive voice is marked on the verb, a 'low' VoiceP is posited; if not, the relevant features are passed on to the IP-group. Furthermore, it may be that any of the features in (14) may be combined to posit

## Universal minimal structure

a single projection; for example, the three object-related features may involve just a single projection.

Concerning vP, under Minimalism (Chomsky 1995, 2001, 2008), this projection is a functional projection above VP, and is related to the subject DP; it is also involved in various verb types such as ditransitives. The vP projection is presumably posited in all languages, but at this point in acquisition its properties (features) need to be acquired, such as whether the subject DP can remain in vP (or not) and exactly which verb types involve the structure. Note that we would still wish to maintain that the earliest syntactic stage does not involve even this functional projection, and that any overt subjects occur in the Spec,VP at the bare VP-stage.

Once the language learner has completed acquisition of the VP-group – that is, he/she has in effect (subconsciously) checked whether or not the input contains evidence for each of the projections in the VP-group, and if so, which of the listed grammatical features are associated with each projection – the acquisition mechanism in UG prompts him/her to move on to the IP (or TP) related functional projections, or the IP-group. Alternatively, the input itself prompts the learner as follows: once all the grammatical features in the VP-group have been exhausted (either by realizing them in a projection, or by ‘deciding’ that the feature is not realized near the VP, and needs to be passed on to the IP-group), any element in the input that cannot be analyzed would trigger positing further structure, i.e. moving on to the IP-group.

As already mentioned, any features (or projections) for which evidence is not found next to the VP will be passed on to the IP-group; this ensures, in particular, that if a NegP is not posited ‘low’ in the structure (as in English), it will be posited ‘high’ in the structure (as in Finnish). Possible projections (or features within a projection) in the IP-group, with intended overlap, include Tense, Mood, Voice, Neg, Subject Agreement,

Universal minimal structure

Subject Clitic and Nominative/Ergative.. Finally, after the IP-group has been satisfied, UG (or triggers in the input in the form of unanalyzed elements) will again prompt the learner to move on to the third group, CP-related functional projections.

Under this approach, the language acquirer has, in some sense, all the information about all the functional projections in the languages of the world available to him/her, but the actual realization of specific functional projections involves finding the relevant evidence in the input to posit a particular projection and determine whether all features involve separate projections or whether some of them are grouped together (such as perhaps in English, Tense and Nominative).

## **6 Conclusion**

We have considered data from first and second language learners whose acquisition is protracted relative to typically developing children's and (for adults) whose exposure to the L2 is informal. The data reveal a preponderance of Root Defaults at the earliest stages of morphosyntactic development across the range of acquisition types and contexts. In searching for an account of learners' early grammars, we discussed how weak and strong continuity advocates have turned to maturation to explain why RDs dwindle with development. If one assumes maturation is subject to a biological clock, those cases of protracted first language acquisition immediately call maturation accounts into question. Thus a maturation account of RDs in child and adult second language is ruled out. We have argued that the RD data point to an initial state in keeping with weak continuity, where the full syntactic tree is not always projected, but rather only a bare VP is. Relaxing Interface Uniformity opens up the possibilities for theories of acquisition under which there is no discontinuity between the earliest stages at which RDs are found

and the subsequent developmental phenomena that result in intermediate non-adult/non-target grammars and ultimately lead to languages which differ from each other in terms of functional projections.

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