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L1 and L2 Word Order Acquisition

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Many parameters proposed in the literature are construction specific to a greater or lesser degree. This has some unfortunate consequences. First, such parameters do not provide an explanation for the rapidity and success of first-language (L1) acquisition. Second, they make it hard to test hypotheses about the nature of second-language (L2) acquisition. In this article, a version of the OV/VO parameter is developed that is not construction specific. It relates various empirical domains, including basic word order, scrambling, Exceptional Case Marking, and the distribution of particles. If correct, this parameter reduces the number of learning tasks for the child. It also allows evaluation of the various hypotheses about the accessibility of parameters in L2 acquisition. Following Clahsen and Muysken (1986; 1989), we argue that, whereas L1 acquisition is a process of parameter setting, L2 acquisition crucially involves the positing of construction-specific rules, a process guided by general learning strategies.

1. THE CONCEPT OF PARAMETERS

Although less attention has been paid to this issue recently, it is crucial that parameters relate knowledge of a wide range of constructions. A parameter that distinguishes OV from VO order, for instance, is psychologically realistic in that it can be set on the basis of simple, positive, and robust data.¹ It falls short, however, if setting this parameter would have no consequences beyond the triggering data.

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¹See Meisel (1995) for an introduction of parameter theory in connection with language acquisition.

If parameters are construction specific, a theory results that is not much different from the rule-based system that parameters were meant to replace. In order to see this, consider how the number of possible grammars grows with each additional parameter. In principle, no more than 12 binary parameters are needed to generate 4,000 different grammars ($2^{12} = 4,096$). Even if no two actually existing languages have the same grammar and if the existing languages form less than 1% of the possible grammars defined by Universal Grammar (UG), no more than 19 parameters have to be assumed ($2^{19} = 524,288$). Of course, calculations of this type only have a relative value, but it should be clear that the more parameters are assumed, the fewer predictions are made.

Fewer predictions are made with respect to language typology, as typological generalizations cannot be captured if every construction is governed by its own parameter. Fewer predictions are made with respect to first-language (L1) acquisition, as less knowledge about the target language is implied by setting each parameter. In addition, Gibson and Wexler (1994) argued that the setting of a parameter is complicated with each extra parameter that is assumed. Thus, an unconstrained parameter theory may fail to solve the logical problem of language acquisition.

Fewer predictions are made, finally, with respect to second-language (L2) acquisition. In recent years, there has been an ongoing debate about the accessibility of parameters in L2 acquisition. Some linguists have argued that L2 acquisition involves, at least to some extent, the positing of construction-specific rules, a process guided by general learning strategies (Clahsen and Muysken (1986; 1989)). Others have argued that it involves the resetting of parameters (DuPlessis, Solin, Travis, and White (1987)). If construction-specific parameters are assumed, it is very difficult to decide between these two approaches. If each parameter is tied to a number of different constructions, however, a test is available: A developmental cluster is to be expected only if parameters are accessible.²

A research strategy now suggests itself. Confronted with linguistic variation, one's first attempt should be to relate it to independently motivated parameters that are psychologically realistic. It is worthwhile, then, to enlarge the empirical scope of the OV/VO parameter. In the first part of this article we therefore develop a version of this parameter that is not only simple to set, but also brings together data from various empirical domains. In the second part we use this parameter to test the effects of parameter setting in L1 and the accessibility of parameters in L2 acquisition. Whereas there is no evidence that the constructions related to the parameter pose different learning tasks to children, this does seem

²An overview of the various positions concerning L2 acquisition can be found in Eubank (1991). See, for further discussion in favor of parameter resetting, White (1985), Hilles (1986), Flynn (1987), and Schwartz (1992) among others. Further discussion of the limited accessibility or inaccessibility of UG can be found in Bley-Vroman (1990), Schachter (1988; 1990), and Clahsen (1990).

to be the case for adult learners, who acquire the relevant constructions one by one. This suggests that L2 acquisition is crucially different from L1 acquisition.

2. THE OV/VO PARAMETER

In this section we develop a version of the OV/VO parameter that is not construction specific.³ The basic idea is that the OV/VO parameter determines two properties of the case system—namely, the direction of case checking (Koopman (1984), Travis (1984)) and the domain in which this operation takes place. In VO languages the checking domain is more narrowly defined than that in OV languages. Hence, adjacency effects occur in VO languages, which are absent if the object precedes the verb.

In section 2.1 we spell out the assumptions about θ theory and case theory that underlie our analysis. We use the (im)possibility of scrambling as an example to illustrate how the system works. In section 2.2 we show how the empirical coverage of the parameter can be extended to particle constructions, extraction, and Exceptional Case Marking (ECM).

2.1. Word Order and Case Adjacency

We assume that arguments are inserted in the syntactic representation bearing case features. At Logical Form (LF), these case features are interpreted. That is to say, thematic functions are associated with case-marked elements in a universal fashion. At Phonetic Form (PF), case features are licensed, and the way this licensing takes place is responsible for a number of crosslinguistic differences. Thus, the syntax of arguments is determined by the interaction of case and θ theory.

θ theory obviously puts limits on what can be done in syntax, but we believe that it allows more flexibility than is usually claimed to exist. In general, θ theory does not define a unique position for every thematic function. It rather defines, in hierarchical terms, a range of positions that can each potentially be associated with a particular θ -role.

Because θ theory is sensitive to hierarchical relations only, constituents on either side of the verb can be thematically related to it. The placement of objects can therefore not be regulated at the LF interface, and the choice between (1a) and (1b) must instead be made at PF.

³The parameter we present here is based on Neeleman (1994) and Neeleman and Weerman (1996). Due to space limitations, the analysis and argumentation here are slightly simplified. For fuller discussion, including a comparison with standard Checking Theory, we refer the reader to the monographs just mentioned.

- (1) a. [_{VP} V DP]
 b. [_{VP} DP V]

More controversially, we assume that even in hierarchical terms θ theory does not define unique positions for arguments. A number of structurally different positions are available, in principle, for any given argument, and the choice between these again depends on other factors. Our claim is that a case-marked constituent can be construed as the argument of a θ -role assigner X if and only if it c-commands X and is contained in X's m-command domain. As a result, an object can be generated anywhere in the verb phrase (VP) and, in particular, in positions not adjacent to the verb. This is illustrated by the structures in (2), where the second element contained in VP is an adverbial. Recall that linear order is irrelevant at this point.

- (2) a. [_{VP} AdvP [_{V'} DP V]]
 b. [_{VP} DP [_{V'} AdvP V]]

It will be clear that the word order freedom allowed in principle by θ theory does not show up in every single language. The reason for this is that case features, which trigger thematic interpretation, must be licensed at PF. The relevant licensing conditions select out of the set of potential argument positions the ones that are actually available.

We believe that two conditions are involved. First, case checking is directional. In any given language, the verb checks case either to the right or to the left. Consequently, the order of object and verb is fixed, even though this order is irrelevant to θ theory. Second, case checking takes place within a fixed domain. This domain is rather narrowly defined in some languages, with the result that, of the various object positions in VP, only the ones adjacent to the verb may be used. We further argue that there is an implicational relation between the direction and the domain of case checking: Checking to the left implies a larger domain than checking to the right. The two choices the child must make are thus combined in a single learning task.

Let us now be more specific. Suppose that case checking is universally conditioned by the parameter in (3).

- (3) Case Checking
 A may check the case of B iff
 a. A precedes/follows B, and
 b. A and B are contained in the same local domain.

By necessity, both syntactic and phonological information are accessible at the PF interface (Zec and Inkelas (1990)). Therefore, the local domain mentioned in (3) can be defined either syntactically or phonologically. However, it is the task

of the PF interface to prepare sentences for pronunciation, and consequently there is a strong inclination to shift to phonological information as soon as possible. Syntactic information can be accessed, but this will be avoided unless other options fail. Because checking takes place at PF, the language-learning child prefers a definition of the checking domain in phonological terms, namely, as the phonological phrase, ϕ . Only if such a definition cannot be maintained will the child resort to a definition of the checking domain in syntactic terms, namely, as the syntactic phrase. Thus, economy can be said to guide parameter setting.

Selkirk (1986) motivates the following mapping procedure for ϕ -formation:

(4) ϕ -Formation

Close ϕ when encountering $]_{XP}$

The procedure in (4) has the effect that the right edges of phonological phrases coincide with the right edges of syntactic phrases. Consider the example in (5a). The mapping device opens a prosodic phrase at the beginning of the sentence. It then moves rightward until it encounters the first right XP bracket, that of *Mary's*. At that point, it closes the first prosodic phrase and opens a new one. The mapping device proceeds in this fashion until the entire syntactic string is scanned. The result is the prosodic structure in (5b), where braces indicate ϕ -boundaries.

- (5) a. [[A friend of [Mary's]] [gave [a book] [to [Sue]]]].
 b. {A friend of Mary's} {gave a book} {to Sue}.

English is a language in which the checking domain is defined in prosodic terms. In (5b), for example, the verb may check the case of its object as these two elements are contained in the same ϕ (see footnote 11 for double-object constructions). It is predicted that in languages like English, the object and the verb must always be adjacent. If an adverbial separates these elements, as in (6a), a prosodic structure results in which case checking is impossible. This problem does not arise if the adverbial appears to the right of the object:

- (6) a. [[John] [[read [slowly]] [the book]]].
 a'. *{John} {read slowly} {the book}.
 b. [[John] [[read [the book]] [slowly]]].
 b'. {John} {read the book} {slowly}.

It seems to be the case, then, that the parameter is specified as follows in English:⁴

⁴As argued in Neeleman and Weerman (1996), the subject of a finite clause is not licensed by case, but by agreement. Hence, its position is not determined by the parameter proposed here. As an anonymous reviewer remarked, this has the consequence that nominative subjects are case-less DPs (contra a Government-Binding-style Case Filter). This position is defended in more detail in the work just mentioned, as well as in Kerstens (1993) and Bittner and Hale (1996).

- (7) Case Checking (VO)
 A may check the case of B iff
- a. A precedes B
 - b. A and B are contained in the same ϕ .

In an OV language like Dutch, the checking domain cannot be defined prosodically. If it were, even a simple sentence like (8a) would be ruled out. In the corresponding prosodic structure the object and the verb are part of different ϕ s, as shown in (8b).

- (8) a. [dat [Jan] [[het boek] las]].
 b. {dat Jan} {het boek} {las}.
 that John the book read

The reason for this is that in an OV language the object precedes the verb. Because the object is a maximal projection, its right edge will correspond to a ϕ -boundary that separates object and verb. Therefore, if children are learning an OV language, the primary linguistic data will already force them to resort to the dispreferred alternative. Instead of a prosodic specification of the parameter, they must choose the syntactic specification: A head and its objects must be in the same syntactic phrase—that is, in the same m-command domain:

- (9) Case Checking (OV)
 A can check the case of B iff
- a. A follows B
 - b. A and B m-command each other.

It is now predicted that OV order coincides with a larger case checking domain. As the notion of m-command is insensitive to linear intervention, more of the object positions allowed by θ theory can actually be used. In particular, objects must be situated within VP, but they do not have to be adjacent to the verb. It will be clear that, given the general flexibility of θ theory, this explains the existence of scrambling, as in (10).

- (10) a. [dat [Jan] [_{VP} [langzaam] [[het boek] las]]].
 that John slowly the book read
 b. [dat [Jan] [_{VP} [het boek] [[langzaam] las]]].
 that John the book slowly read

So, there is a logical relation between OV order and case checking in syntactic domains. The relation between VO order and a prosodic definition of the checking domain is more subtle. Although there is no logical necessity that links the two, they are connected by the crucial role of economy in parameter setting. If the

object follows the verb, it can be placed in the same ϕ . This implies that a prosodic definition of the checking domain is possible in VO languages, and as it is expensive to access syntactic information at PF, this is the definition that will be selected by the language-learning child. Thus, the relation between the domain and the direction of case checking is a consequence of the logical parameter space in conjunction with the child's parameter-setting mechanism.

Typological observations suggest that there is indeed a relation between the availability of scrambling and an OV setting of the parameter. The Germanic OV languages (i.e., Dutch, German, Frisian, and Old English) indeed all have (had) the possibility of placing adverbials between an object and the verb. As far as we know the same is true for Afrikaans and non-Germanic OV languages like Japanese, Korean, and Turkish. In Germanic VO languages without V-to-I (i.e., Danish, English, Norwegian, and Swedish), the order V-Adv-O is ungrammatical. The same is true of Icelandic, if we control for the fact that there is V-to-I in this language. Although V-to-I may lead to intervention of adverbials between the verb's surface position and the object, the trace of the verb will still be in the same phonological domain as its complement (the fact that traces are visible at PF is evidenced by phenomena like *wanna* contraction, cf. Chomsky (1981)):

- (11) a. DP [_I V] [AdvP [_v DP]]
 b. {DP} {V AdvP} {_v DP}

The prediction is that if the verb does not move, a surface adjacency effect can be observed. This is indeed the case, as the Icelandic data in (12) show.

- (12) a. {Jón} {hefur lesið bækurnar} {rækilega}.
 John has read the-books thoroughly
 b. *{Jón} {hefur lesið rækilega} {bækurnar}.
 John has read thoroughly the-books

Again, the generalization also seems to hold for non-Germanic VO languages (e.g., Berbice Dutch, French, and Italian).⁵

We have now explained why case adjacency holds in VO languages only. This still leaves some questions unanswered, however. Suppose that an adverbial is generated in a position that structurally intervenes between the verb and a determiner phrase (DP) whose case must be checked. For an OV language like

⁵See Bayer and Kornfilt (1994) for German, De Haan (1993) for Frisian, Van Kemenade (1987) for Old English, Povelis (1993) for Afrikaans, Ueyama (1994) for Japanese, Lee and Santorini (1994) for Korean, Kornfilt (1990) for Turkish, Giusti (1990) for the mainland Scandinavian languages, Collins and Thráinsson (1996) for Icelandic, Kouwenberg (1993) for Berbice Dutch, Pollock (1989) for French, and Belletti (1990) for Italian. See Vikner (1995) and Rohrbacher (1994) for the distribution of V-to-I in the Germanic VO languages.

Dutch, this would result in the by-now familiar structure in (13a). For a VO language like English, the resulting structure would be the one in (13b). As remarked before, this structure is ruled out as the object and the verb are not contained in the same ϕ (cf. 13c). Hence the object's case cannot be checked.

- (13) a. [_{VP} DP [_V AdvP V]]
 b. [_{VP} [_V V AdvP] DP]
 c. *{V AdvP} {DP}

The conclusion that this line of reasoning seems to lead to is that English should lack a correlate to the construction in (13a). This is not correct, however. English does have a correlate to (13a), but in constructions of that type a movement operation must take place that makes it possible to check the case of the object.

Recall that θ theory does not force a linear order on an object–verb pair. It would therefore be wrong to say that the DP in (13b) must follow the verb. It may be generated in any position that can be licensed at PF. Instead of (13b), the derivation could therefore start out from (14a), given that (13b) and (14a) have identical hierarchical properties. Although (14a) as such does not solve the case problem caused by the intervening XP, it makes it possible to solve this problem by a simple leftward movement of the verb, as in (14b). In the structure derived by this movement, the verb and the object are in the same prosodic domain, and they can therefore enter into a checking relation (cf. 14c).

- (14) a. [_{VP} DP [_V V AdvP]]
 b. [_V V [_{VP} DP [_V t_V AdvP]]]
 c. {V DP} {t_V AdvP}

The claim that we defend, then, is that in English, Larsonian VP shells are generated any time an element threatens to separate the verb and the object. Contrary to what Larson (1988) suggested, however, these shells are not projected to satisfy conditions on θ -role assignment, but to meet the surface conditions to which case checking is subject. We can maintain, then, that the option of generating VP shells, as in (14b), is universally available, rather than a particularity of English. However, it is ruled out by economy considerations if a well-formed structure can be derived without V-movement (as is the case in OV languages). One view of VP shells that ties in with this is presented in Ackema, Neeleman, and Weerman (1993) and Koenenman (1996), who argued that extra structure can be generated by self-attachment of the verb to its own projection. Although other views of VP shell formation can be reconciled with the analysis proposed here, the self-attachment approach explains the sensitivity of the process to economy.

The behavior of secondary predicates provides some evidence for the structural ambiguity of English postverbal adjuncts. Williams (1980) showed that predica-

tion is possible only if the subject c-commands the predicate with which it is associated. The effects of this restriction are clearly visible in Dutch. A depictive generated lower than the object can be linked to either this DP or the subject, but a depictive generated between the object and the subject has to be linked to the latter (the depictive and its subject appear in boldface):

- (15) a. dat **Jan** Marie **naakt** ontmoette.
 that John Marie nude met
 a'. dat Jan **Marie** **naakt** ontmoette.
 that John Marie nude met
 b. dat **Jan** **naakt** Marie ontmoette.
 that John nude Mary met
 b'. *dat Jan **naakt** **Marie** ontmoette.
 that John nude Mary met

Interestingly, an English example like *John met Mary nude* is ambiguous between a subject-oriented and an object-oriented reading of the depictive. The subject-oriented reading is unproblematic, as it is allowed even if the depictive is attached higher than the object (cf. 16a). The object-oriented reading, however, can only be accounted for if the depictive is attached lower in the tree than the object. This is, in fact, the case if a VP shell is generated (cf. 16b). The existence of low attachment of adverbials in English is thus confirmed.⁶

- (16) a. **John** [_{VP} [_{V'} met Mary] **nude**].
 b. John [_{V'} met [_{VP} **Mary** [_{V'} t_V **nude**]]].

The proposed analysis makes a further prediction. Constructions in which Case theory can be satisfied without verb movement will not contain VP shells. So, no VP shells are projected in Dutch, as the case system of this language does not require adjacency of the object and the verb. For English, the fact that VP shell formation is constrained by economy entails that if a prepositional phrase complement (PP-complement) rather than a DP-complement is present, the verb will remain *in situ*. Because PPs do not enter a checking relation with the verb, the construction in (17) satisfies Case theory vacuously.

- (17) [_{VP} [_{V'} V AdvP] PP]

This prediction is correct. English PPs are like Dutch DPs in that they freely may be separated from the verb by, for instance, manner adverbials:

⁶A similar line of argumentation is used by Vanden Wyngaerd (1989) to motivate "scrambling" in English. However, Vanden Wyngaerd analyzed this phenomenon as movement to Spec-AgrOP rather than in terms of base generation.

- (18) a. John talked to Bill slowly.
 a'. John talked slowly to Bill.
 b. The director looked at the telegram pensively.
 b'. The director looked pensively at the telegram.

In sum, we make the following proposals: First, there is a universal system of θ -role projection that determines which positions can host an argument. This system is highly flexible, in that every θ -role can in principle be assigned within the head's maximal projection. Second, there is a parameter that determines both the direction and the domain of case checking and that selects out of the set of potential argument positions the ones that can actually be used in a given language. Third, from these modules it follows that adverbials may surface between the object and the verb in OV languages, but not in VO languages. In the latter, VP shells are formed if an adverbial (or another XP) is attached between object and verb.⁷

2.2. Further Consequences

In this section we consider the consequences of the assumptions made previously for particle constructions, extraction, and ECM.

It has been argued that, universally, the verb-particle combination forms a complex verbal head in syntax (K. Johnson (1991), Neeleman (1994), Neeleman and Weerman (1993a), Roeper and Keyser (1992), and others). The Dutch structure in (19a) and the English one in (19b) have been defended:

- (19) a. [_V Prt(P) V]
 b. [_V V Prt(P)]

Two remarks are in order here. First, the fact that particles precede the verb in OV languages, and follow it in VO languages, must be a result of the setting of the OV/VO parameter. This follows if particles, like objects, have features that must be checked against the verb (Neeleman and Weerman (1993b)); it would take us too far afield to discuss here which features might be involved. Second, as indicated, we assume that particles may optionally project. Projection is expected in syntactic positions, and therefore particles can be XPs. However, X-bar Theory allows nonprojection below the X-zero level. It can be argued that this is only possible if the verb-particle combination is stored as a lexical unit (Neeleman (1994)). We return to this in section 3.1.

⁷The generalizations suggested here abstract away from the influence of morphological case. To some extent DPs with morphological case behave like PPs in that their case does not need to be checked. If so, more word order freedom is to be expected, even in VO languages (see for discussion Neeleman and Weerman (1996)).

The behavior of Dutch particles follows straightforwardly from the assumption that they are adjoined to the verb. Their position in the clause is immediately to the left of the verb. Although the placement of adverbials is rather free in Dutch, they cannot separate a particle from the verb (cf. 20a,a'). Several other arguments can be given for the structure in (19a). One that is relevant here is that verb-particle combinations can be coordinated freely with simplex verbs (cf. 20b,b').⁸

- (20) a. dat Jan Marie geregeld [_v uit lacht].
 that John Mary regularly out laughs
 a'. *dat Jan Marie uit geregeld lacht.
 that John Mary out regularly laughs
 b. dat Jan het boek [[_v uit pakt] en [_v leest]].
 that John the book out wraps and reads
 b'. dat Jan het boek [[_v koopt en [_v in pakt]]].
 that John the book buys and in wraps

Note that particles, even if they project, will not block case checking in Dutch, as their presence does not affect the verb's syntactic checking domain. The situation in English is more complicated. Particles either surface adjacent to the verb, as they do in Dutch, or appear to the right of the object:

- (21) a. John looks up the information.
 b. John looks the information up.

Given the assumptions made before, the construction in (21a) is the most direct counterpart in English of the Dutch verb-particle construction. As in Dutch, the particle is adjoined to the verb in (21a), whereas in (21b) it has been separated from the verb by a movement operation. Indeed, the construction in (21a) shares certain other characteristics with its Dutch counterpart. No adverbial may appear between the verb and the particle (cf. 22a,a'), and coordination of the verb-particle combination with a simplex verb is unproblematic (cf. 22b,b').⁹

- (22) a. John slowly [_v looks up] the information.
 a'. *John looks slowly up the information.

⁸The example in (20b') cannot be a case of VP coordination plus conjunction reduction. In so far as forward conjunction reduction is allowed in Dutch, it requires a special intonational pattern that is absent here. It also cannot be the case that two VPs are coordinated and that there has been an across-the-board application of leftward object movement.

⁹Crucially, examples like (22b') cannot be analyzed as either cases of VP coordination plus conjunction reduction or instances of right-node raising. English does not have the required type of backward reduction, and the example is grammatical without the intonational breaks that accompany right-node raising. It seems that we are indeed dealing with a complex predicate coordinated with a simplex verb.

- b. John $[[_{\text{V}} \text{wrote up}] \text{ and } [_{\text{V}} \text{published}]]$ his dissertation last year.
 b'. John $[[_{\text{V}} \text{wrote}] \text{ and } [_{\text{V}} \text{mailed off}]]$ his dissertation last year.

The question, then, is how the construction in (21b) can be derived. Recall that particles may project, but do not have to. So, in English the constructions in (23a) and (23b) coexist.

- (23) a. $[_{\text{V}} \text{ V Prt}]$
 b. $[_{\text{V}} \text{ V PrtP}]$

The apparent optional movement in (21) can now be explained as a result of different underlying structures. An object added to the structure in (23a) can be licensed if generated to the right of the verb-particle combination, as in (24a). The reason for this is straightforward. In English, case is checked rightward in prosodically defined domains. These domains are built up in such a way that the right boundaries of phonological domains coincide with right XP brackets. In the prosodic structure derived from (24a), the verb, the particle, and the object will consequently be in the same ϕ (cf. 24b). Hence, the object's case can be checked.

- (24) a. $[_{\text{VP}} [_{\text{V}} \text{ V Prt}] \text{ DP}]$
 b. $\{ \text{V Prt DP} \}$

Suppose that an object is added to the structure in (23b). This object will not be licensed if it is simply generated to the right of the verb. Because the particle now projects, it will trigger ϕ -closure, with the effect that the object and the verb are no longer in the same checking domain (cf. 25). Additional measures are therefore required.

- (25) a. $[_{\text{VP}} [_{\text{V}} \text{ V PrtP}] \text{ DP}]$
 b. $\{ \text{V PrtP} \} \{ \text{DP} \}$

To begin with, the object is generated to the left of the verb. Then, the verb is moved out of its base position and attached to the top node of its own projection. In the newly formed structure, it is the moved verb that projects, and not the node to which it is attached. A VP shell is thus derived. The object can now be licensed, because in the prosodic structure assigned to (26a), the verb and the object are in the same checking domain:¹⁰

¹⁰The order verb-object-particle is the only possible order when the object is a pronoun. The reason for this might be that pronouns do not check their use in phonological phrases. They rather have to be part of the verb's clitic group. If so, an intervening head, such as a particle, would block case checking and therefore VP shell formation is obligatory, even if the particle does not project.

- (26) a. [_{V'} V [_{VP} DP [V t_V PrtP]]]
 b. {V DP} {t_V PrtP}

So, following K. Johnson (1991), we hold verb movement responsible for the separation of the particle and the verb in (21b). One argument that shows that such an analysis is on the right track is the following: As observed before, verb-particle combinations can be coordinated with simplex verbs in English. It is predicted that if this happens, the formation of a VP shell is blocked. The particle cannot be stranded by verb movement, because the verbs may not move separately (due to the coordinate structure constraint) and there is no unit that includes the two verbs, but excludes the particle. The examples in (27) are thus ruled out.

- (27) a. *John [wrote and published]_i [his dissertation [t_i up]] last year.
 b. *John [wrote and mailed]_i [his dissertation [t_i off]] last year.

There are many theories about particle constructions that capture the data in (27), but far fewer that can explain the combination of (27) and (22b,b'). It seems that this combination of data can only be accounted for if the verb and the particle form a complex predicate that can be broken up by movement, as in the analysis proposed here.

A number of predictions follow from the proposed analysis. In the examples discussed so far, the particle does not have to project, as it does not take specifiers or complements. However, if such elements are present, projection is obligatory, and hence verb movement into a VP shell must take place. If it did not, the object's case could not be checked. This first prediction is borne out by the data in (28). The verb must be shifted leftward if the particle is accompanied by a specifier or a complement.

- (28) a. John [looked [(right) up]] the information.
 a'. John looked_i [the information [t_i [(right) up]]].
 b. John [ran [up (*the pole)]] the flag.
 b'. John ran_i [the flag [t_i [(up the pole)]]].

Consider next the behavior of verb-particle combinations that select a PP-complement. Because the DP contained in a PP-complement can check its case against the preposition, PPs are independent of the verb for their licensing. They therefore do not have to be contained in the verb's phonological domain. This means that whether the PP is added to (23a) or (23b), no VP shell has to be formed. Even if the particle projects, as in (29), this does not lead to ungrammaticality.

- (29) a. [_{VP} [_V V PrtP] PP]
 b. {V PrtP} {PP}

It is to be expected, then, that particles will never appear to the right of a PP-complement, because that is the order that would result from the unnecessary projection of a VP shell. This prediction is borne out:

- (30) a. John [gave up] on that solution.
 a'. *John gave_i [on that solution [t_i up]].
 b. John [walked out] on Mary.
 b'. *John walked_i [on Mary [t_i out]].

It is expected, furthermore, that a particle that intervenes between the verb and a PP-complement may be accompanied by elements that force projection, even though this was impossible for particles that intervene between the verb and a DP. As previously remarked, PPs are not dependent on the verb for their licensing. This prediction is also correct:

- (31) a. John [gave [right up]] on that solution.
 b. John [walked [right out]] on Mary.

A third prediction about particle constructions containing a PP-complement is that adverbials may not appear in between the verb and the particle: These two elements form a complex predicate at the surface as well as in the base. This prediction was also made for regular particle constructions that appear in the verb-particle-DP order (cf. 22a,a'). However, in that case the adverbial may also make it impossible to license the object. Such an independent factor cannot be used to rule out the ungrammatical examples in (32).

- (32) a. John initially [gave up] on that solution.
 a'. *John gave initially up on that solution.
 b. John finally [walked out] on Mary.
 b'. *John walked finally out on Mary.

The final prediction discussed in this section concerns the status of the object in a particle construction. If the verb remains *in situ*, the object of a particle is like any other object. But if a VP shell is created, the object is in fact an exceptionally case-marked specifier. It is well known that exceptionally case-marked subjects in English cannot be extracted from. One may therefore expect the object of a particle verb to be an island if a VP shell is projected, but not if the construction surfaces unaltered. This prediction is borne out by the data in (33) (see also Kayne (1985)).

- (33) a. [Which philosopher]_i did John [look up] [information about t_i]?
 a'. ?*[Which philosopher]_i did John look_j [[information about t_i] [t_j up]]?
 b. Who_i did John [send back] [pictures of t_i]?
 b'. ?*Who_i did John send_j [[pictures of t_i] [t_j back]]?

- c. What_i did John [cut open] [a box of t_i]?
 c'. ?*What_i did John cut_j [[a box of t_i] [t_j open]]?

Of course, extraction from the object of a particle verb in Dutch does not pose any difficulty (cf. (34)) because projecting VP shells is unnecessary in this language. Material that intervenes between the verb and the object does not block case checking because the checking domain is defined syntactically.

- (34) a. Waar_i heeft Jan [informatie over t_i] [op gezocht]?
 what has John information about up looked
 b. Wat_i heeft Jan [t_i voor foto's] [terug gestuurd]?
 what has John for pictures back sent
 c. (de sigaren) waar_i Jan [een doos van t_i] [open gesneden] heeft
 the cigars that John a box of open cut has

In sum, differences in the syntax of Dutch and English particle constructions follow from the fact that case is checked in syntactic domains in OV languages, whereas it is checked in prosodic domains in VO languages. This means that an extremely simple analysis of Dutch can be given: VPs containing a particle simply surface unaltered. In English, the situation is more complicated (but only slightly), as a VP shell must sometimes be created.¹¹

¹¹The proposed parameter also has consequences for the syntax of double-object constructions:

- (i) a. dat Jan zijn vader een boek geeft.
 that John his father a book gives
 b. John gives his father a book.

For Dutch, one can just assume that both the Goal and the Theme are contained in VP, such that the Goal (DP_G) c-commands the Theme (DP_T) (in accordance with the thematic hierarchy defended in Grimshaw (1990)). Such a construction would surface as in (ia), as case is checked in syntactic domains in Dutch.

- (ii) [_{VP} DP_G [_{V'} DP_T V]]

As argued by Larson (1988), a VP shell is generated in English double-object constructions. The verb must check the case of both arguments, which is impossible in the direct correlate of (ii):

- (iii) a. [_{VP} [_{V'} V DP_T] DP_G]
 b. *{V DP} {DP}

A grammatical construction will only be derived if the Goal is generated to the left of the verbal projection line. Movement of the verb will lead to a structure in which the case of the Goal can be checked by the moved verb and the case of the Theme can be checked by its trace:

- (iv) a. [_{V'} V [_{VP} DP_G [_{V'} t_V DP_T]]]
 b. {V DP} {t_V DP}

This analysis correctly predicts that extraction out of indirect objects is more problematic in English than in Dutch (for more discussion see Neeleman and Weerman (1996)).

The typological prediction, then, is that particles always show up adjacent to the verb in OV languages, whereas in VO languages they will be separated from the verb if they project. This prediction seems to be correct. OV languages like Afrikaans, Frisian, and German have particles that indeed appear to the immediate left of the verb. VO languages like Danish, Icelandic, Norwegian, and Swedish indeed show a dissociation of the verb and (projecting) particle-like elements.¹²

Up to now we have argued that the syntactic checking domain of Dutch is larger than the phonological checking domain of English, and therefore Dutch is the more permissive language. This is not always the case, however. In some constructions, the phonological domain is actually larger than the syntactic one. ECM is an example.

As is well known, the subject of an embedded infinitival clause may be case marked by a c-commanding head in English. This phenomenon is much more restricted in Dutch. In this language, V-to-V raising is a prerequisite for ECM (Reuland (1982)). Consequently, the range of overt subjects in nonfinite clauses is rather limited. Of the three types of ECM constructions found in English (cf. (35)), only one has a Dutch correlate (cf. (36)).

- (35) a. John sees [Mary dance the tango].
 b. John expects [Mary to read Shakespeare].
 c. John wants very much [for [Mary to be appointed]].

- (36) a. dat Jan [Marie de tango t_i] [ziet dansen]_i.
 that John Mary the tango sees dance
 b. *dat Jan [Marie t_i] verwacht [Shakespeare te lezen]_i.
 that John Mary expects Shakespeare to read
 c. *dat Jan besluit [om [Marie benoemd te worden]].
 that John decides for Mary appointed to be

In Dutch, a case is checked leftward in syntactically defined domains. Because a verb and the subject of its complement do not m-command each other, they will be contained in different syntactic domains. Consequently, ECM is ruled out unless something special happens. Something special indeed happens in V-to-V raising constructions. It is traditionally assumed that V-to-V raising unifies the domains of the embedded verb and the verb it is adjoined to (Evers (1975)).¹³

¹²See LeRoux (1988) for Afrikaans, De Haan (1997) for Frisian, Stiebels and Wunderlich (1994) for German, Collins and Thráinsson (1996) for Icelandic, and Svenonius (1996) for the mainland Scandinavian languages. Swedish is exceptional in that particles do not project and consequently appear adjacent to the verb. Resultatives do project, however, and display the expected behavior.

¹³It has been argued that, at various stages of generative grammar, head movement extends syntactic domains. In Evers's (1975) pre-GB analysis, head movement facilitated pruning; in Baker's (1988) analysis, the Government transparency corollary explains transparency effects; and in recent Minimalist work, such effects follow from the assumption that head movement lifts minimality barriers. For our present purposes, it is sufficient to say that if an XP is generated in the projection

Consequently, in (36a) the case of the embedded subject can be checked against the matrix verb. (36b,c) are ungrammatical because no V-to-V raising, and therefore no extension of the matrix verb's checking domain, takes place. This is actually a general pattern in OV languages. Afrikaans, Frisian, and German, for example, all have ECM in V-to-V raising constructions only—that is, only if clause union takes place.¹⁴

Given the way case is checked in English, it also follows that in this language ECM requires no extension of the syntactic domain. As case is checked in phonological domains, the matrix verb and the exceptionally case-marked subject should be part of the same phonological phrase. This turns out to be so. Although the embedded subject *Mary* and the matrix verb *expect* are part of different syntactic domains (cf. (37a)), they are contained in the same ϕ (cf. (37b)). Hence, case checking may proceed.

- (37) a. [John [expects [Mary [to leave]]]].
 b. {John} {expects Mary} {to leave}.

It is now predicted, correctly, that if an adverbial intervenes between the embedded subject and the verb, case checking is impossible, even when the adverbial is part of the complement clause. As shown in (38), intervention of an adverbial has the effect that the verb and the embedded subject end up in different prosodic domains.

- (38) a. [John [expects [tomorrow [Mary [to leave]]]]].
 a'. *{John} {expects tomorrow} {Mary} {to leave}.
 b. [John [expects [Mary [to leave tomorrow]]]].
 b'. {John} {expects Mary} {to leave tomorrow}.

In sum, the assumption that case is checked in different domains in OV and VO languages explains not only differences in the syntax of particles, adverbials, and double-object constructions, but also the fact that English allows a wider range of ECM constructions than Dutch.

It is, in fact, a general property of VO languages that if they allow ECM, they do so without V-to-V raising. This is not to say that there are no other factors

of a head Y and Y moves to a higher head Z, then the m-command domain of XP is ZP and not YP. In some analyses of the constructions at hand, clause union is not derived by movement of the embedded verb but by other technical means (either by base generation of a complex verbal head, or by scrambling of all embedded material to the matrix clause). Although we still prefer an analysis in terms of verb raising, we do not discuss the issue here, because it does not bear directly on the proposal in the main text: What we argue is that clause union is a prerequisite for ECM in OV languages, and this is uncontroversial.

¹⁴See Broekman (1995) and Ponelis (1993) for Afrikaans, De Haan (1993) for Frisian, and Evers (1975) for German.

governing ECM, but among these we do not find (overt) V-to-V raising—the factor that determines the well-formedness of ECM in OV languages.¹⁵

¹⁵It has been claimed earlier that clause union is typical of ECM in OV languages but not of ECM in VO languages. Bennis and Hoekstra (1985), for example, suggested that the interaction of adverbials and exceptionally case-marked subjects leads to this conclusion. Bennis and Hoekstra focused on contrasts between English and Dutch, but corroborative evidence can be found in Scandinavian languages like Danish (Allan, Holmes, and Lundskaer-Nielsen (1995)) and Swedish (Holmes and Hinchliffe (1994)). Nevertheless, there are VO languages where the distribution of ECM is very limited. The Romance languages are examples. Although ECM is widespread in Rumanian (see Rivero (1991) for discussion), it is absent in French and Italian:

- (i) Am vrut pe cineva să citească cartea.
I have wanted ACC somebody to read book-the
(Rumanian)
- (ii) a. *Je croyais Jean être arrivé.
I believe John be arrived
(French)
b. *Sostengo Gianni essere intelligente.
I believe John be intelligent
(Italian)

As observed by Kayne (1981), ECM is not entirely absent from French and Italian. If the embedded subject moves to a higher position, the structure becomes grammatical:

- (iii) a. Le garçon que_i je croyais t_i être arrivé.
the boy that I believe be arrived
b. Il ragazzo che_i sostengo t_i essere intelligente.
the boy that I believe be intelligent

The contrast between (ii) and (iii) can be understood as follows. In French and Italian the infinitival marker *de/di* is obligatorily absent in ECM constructions. Suppose, therefore, that the I-node is empty and hence subject to a PF-licensing constraint which operates in a way comparable to PF-case checking. Then, the ungrammaticality of the examples in (ii) is a consequence of the fact that the empty I-node and the matrix verb are not in the same phonological domain:

- (iv) ... {V Subject} {I ...} ...

In (iii) the empty I-node and the matrix verb are not separated by an overt XP but by a trace. It can be argued that traces do not trigger ϕ -closure; they behave like phonological words at PF, so that they block processes like *wanna* contraction but not case checking. Hence, the constructions in (iii) correspond to the following well-formed PF-structure:

- (v) ... {V t I ...} ...

Note that in English and Rumanian the I-node is filled by *to* and *să*, respectively, so that the PF-constraint is satisfied vacuously. Thus, it can be maintained that, modulo intervening factors (in this case PF-licensing of the empty I-node), ECM is available in VO languages even if no V-to-V raising takes place.

3. ACQUISITION

If the OV/VO parameter is accessible to the language learner, one expects that setting this parameter has a range of effects. This parameter governs the position of objects with respect to the verb as well as scrambling, the distribution of particles, extraction, and ECM. If the language acquirer finds out that the verb follows (or precedes) the object, he or she will automatically have knowledge about these other phenomena. In this section we test the effects of the OV/VO parameter in L1 and its accessibility in L2 acquisition. In section 3.1 we see whether Dutch and English data from L1 acquisition are as expected under the proposed parameter. In section 3.2 we consider L2 acquisition of Dutch by speakers of English and L2 acquisition of English by Dutch natives, and we see if patterns here deviate from the patterns of L1 acquisition.

3.1. First-Language Acquisition

Before we turn to development in children, it is important to consider the extent to which L1 data can be used to motivate parametric clustering. As we see it, such clustering can never be demonstrated conclusively on the basis of L1 acquisition. This is apparent in view of the fact that any pattern of acquisition can be captured in terms of construction-specific parameters (because such parameters do not make any predictions about typological clusters in the first place). Hence, the alternative can never be proven wrong (although it seems to us uninteresting). More important, even if there is parametric clustering this does not mean that all consequences of the pertinent parameter can be observed simultaneously. Due to independent reasons, constructions that illustrate implications of an already-set parameter may not be available for some time. These independent reasons may be internal to the grammar; some effects of a parameter may for instance depend on the setting of another parameter. The cause of delay may also be located outside the grammar, namely, when pragmatics or computational complexity come into play. A similar point has been made by Otsu (1981), Schachter (1989), and White (1985), among others.

So, the main evidence for parametric clustering must come from theoretical and typological considerations. This is not to say, however, that no predictions with respect to L1 acquisition are made. Most important, parametric clustering predicts that certain types of errors do not occur. If two phenomena are parametrically related, they represent a single learning task. Even though appearance of one of the phenomena may be delayed for independent reasons, it does not, as such, have to be learned separately. Consequently, errors that are predicted if the second phenomenon were to be acquired independently should not occur.¹⁶

¹⁶Obviously, the reverse is not true. The absence of errors does not indicate a relation between the relevant phenomenon and any particular parameter.

A further, more indirect, prediction is that if there is a delay, there should be a plausible independent factor explaining it.

Given this, the crucial question is whether children make certain errors when acquiring phenomena related to the OV/VO parameter. If such errors are absent, the L1 data can be said to confirm the proposed formulation of the parameter. In order to determine this, we have followed the development of several children as observable in the CHILDES corpora (MacWhinney (1995)). For Dutch we used the corpora of Hein and Thomas (Elbers and Wijnen (1992)) and Laura and Sarah (Van Kampen (1997)). For English we studied the corpora of Peter (Bloom (1970)) and Shem (Clark (1978)). In addition, we have made use of observations in the literature.

Many studies on first-language acquisition show that basic word order is acquired very early in Dutch and English. In fact, as soon as any order can be observed (i.e., once the child has reached the Two-Word stage), there are few or no counterexamples with respect to the basic order of the target language. Dutch children will use OV order, as argued, for instance, by De Haan (1987), whereas VO order is used by English children (see, e.g., Bloom (1970) and Lebeaux (1989)). Here we give some examples illustrating this:

- (39) a. Boeke kijk.
 book watch
 (Laura, 1;9)
 b. Paardje rijden.
 horsie ride
 (Laura, 1;10)
 c. Dit hebben.
 this have
 (Sarah, 1;11)
 d. Boekje lezen.
 bookie read
 (Sarah, 2;0)
- (40) a. Open train.
 (Peter, 1;9)
 b. Fix it.
 (Peter, 1;9)
 c. Want some juice.
 (Shem, 2;2)
 d. I want that one there.
 (Shem, 2;2)

It is predicted that once the OV/VO parameter is set, children will know whether the target language allows for scrambling. Note that this can only be observed if the child is able to produce more complex structures than those in (39) and

(40): at least an adverbial, an object, and a verb must be present. In order to test this prediction, we have performed a search in the corpora previously mentioned for a set of common adverbials. Our findings are as expected. As soon as adverbials, objects, and verbs are combined, English children utter word orders like in (41), whereas at no stage were we able to find violations of case adjacency in the corpora of Peter and Shem. As far as we know such violations have never been reported in the literature either.

- (41) a. Didn't have a nap today.
(Peter, 2;4)
- b. I'm gonna make one right here.
(Peter, 2;7)
- c. I got a horse too.
(Peter, 2;9)
- d. Because the thief steal purse first.
(Shem, 2;4)
- e. Throwing the ball now.
(Shem, 2;5)
- f. You make exercises in here.
(Shem, 2;7)

In Dutch, on the other hand, we expect both scrambling and nonscrambling orders to be found as soon as adverbials, objects, and verbs are combined. One proviso must be made: In adult Dutch, scrambling is restricted by and large to definite DPs (abstracting away from special readings of indefinites). The reason for this is that scrambled elements must have a specific reference as they are anaphorically dependent on the preceding discourse ("D-linked," "familiar," and "nonfocused" are other terms used in the literature). In fact, scrambling order and "specificity" co-occur across languages (De Hoop (1992), Neeleman and Reinhart (in press)). This strongly suggests that this connection is encoded in UG. Consequently, we expect that scrambling orders appear as soon as the child uses definite DPs. The corpora of Hein, Thomas, Laura, and Sarah suggest that this is indeed the case. Some examples of scrambling orders are given in (42).¹⁷

- (42) a. Ik wil de yoghurt even pakken.
I want the yogurt quickly get
(Thomas, 2;7)
- b. Ik ga de knoop even pakken.
I go the button quickly get
(Thomas, 2;7)

¹⁷Note that in (42f,h,j,m) the verb has moved to C. However, the fact that the object appears to the left of the adverbial shows that we are dealing with scrambling constructions here.

- c. Ik wil even Kermit ook meenemen.
I want quickly Kermit also along-take
(Thomas, 2;8)
- d. Ik vind dat ook lekker.
I find that also tasty
(Thomas, 2;10)
- e. Ditte nu opeten.
this now eat
(Hein, 2;5)
- f. Ik heb m'n vuilnisbakauto hier.
I have my garbage-can-car here
(Hein, 2;7)
- g. Ik ga dat ook weer opruimen.
I go that also again up-clean
(Hein, 2;9)
- h. Zie de knie even niet.
see the knee for a while not
(Hein, 2;9)
- i. Dese ook nog lese, hè.
this one also still read, right
(Laura, 2;3)
- j. 'k Wi dese hier.
I want this one here
(Laura, 2;3)
- k. De zakje eve kijke.
the bag for a while watch
(Laura, 2;10)
- l. Ja, joep ook in dieretuin esien.
yes Joep also in zoo seen
(Sarah, 2;4)
- m. Ik mag deze nou, ikke.
I can have this one now, I
(Sarah, 2;6)
- n. Deze, ik ga deze nu dicht, zo dicht.
this one I go this one now closed, so closed
(Sarah, 2;11)

As soon as adverbials are present we also find definite DPs in the unscrambled order:

- (43) a. Heb je ook Emilie zien?
have you also Emilie seen
(Thomas, 2;4)

- b. Ik wil ook jouw pap.
I want also your porridge
(Thomas, 2;10)
- c. Moet nog de beer geven.
must yet the bear give
(Hein, 2;7)
- d. Jolande zo deze stiften.
Jolande thus this one draw
(Hein, 2;8)
- e. Moet even die kussen hebben.
must for a while that pillow have
(Hein, 2;9)
- f. So dese maken.
thus this one make
(Laura, 2;3)
- g. Ikke ook die hebbe.
I also that one have
(Laura, 2;4)
- h. Moet eve dit pakken.
must quickly this take
(Laura, 2;7)
- i. Moe efe die afhalen.
must quickly that one off-take
(Laura, 2;11)
- j. Zo, wil jij even die boek.
so, want you for a while that book
(Sarah, 2;8)
- k. Jij moet ook deze meedoen.
you must also this one along-do
(Sarah, 3;3)

These data agree with our predictions. The conclusion that scrambling is available as soon as adverbials are available is further supported by the findings of Schaeffer (1997). Schaeffer performed an experiment in which the use of scrambling across negation was tested with adults and children of various ages. Her conclusion was that from the very first stages the syntactic option of scrambling is present in Dutch children. We replicate her findings for the placement of definite DPs and proper names in a pragmatic context that favors scrambling in Table 1 (Schaeffer (1997, 96)).

Table 1 shows that there is scrambling in 2-year-olds and that there is a development in the usage of this grammatical option. Schaeffer (1997) concluded that this development is due to a discourse principle concerning specificity, which has not yet been acquired by the 2-year-olds, but which is present, at least in

TABLE 1
Placement of Definite Determiner Phrases (DPs) and
Proper Names with Respect to Negation

Age	Definite DP		Proper Name	
	Pre-Neg.	Post-Neg.	Pre-Neg.	Post-Neg.
2	30% (7)	70% (16)	31% (6)	69% (13)
3	72% (26)	28% (10)	73% (22)	27% (8)
4	82% (31)	18% (7)	79% (22)	21% (6)
5	76% (26)	24% (8)	86% (25)	14% (4)
6	83% (24)	17% (5)	86% (18)	14% (3)
Adults	96% (105)	4% (4)	99% (67)	1% (1)

Note. The numbers in parentheses refer to the absolute number of occurrences of the pattern.

some form, in the 3-year-olds. This is, in fact, a familiar pattern in acquisition. As argued by Chien and Wexler (1990) and Avrutin and Wexler (1992), for instance, Binding Theory is operative from the earliest stages on. The pragmatic principles that complement Binding Theory, however, are learned relatively late.¹⁸

We next turn to ECM. We have done a search in the previously mentioned corpora for potential ECM verbs. The prediction is that Dutch children will only produce ECM constructions with matrix verbs that trigger verb raising. Given the complexity of verb raising, ECM should be rather infrequent in Dutch. This is correct. We found few examples, and we did not find overgeneralizations to other classes of verbs. Some examples are given in (44).

- (44) a. Laat es Kermit laten zien.
let once Kermit let see
(Thomas, 2;9)
- b. 'k Hoor grote aankomen.
I hear big-one arrive
(Hein, 2;6)

¹⁸A superficial survey of the CHILDES corpora might suggest that scrambling is delayed in some children. This, however, can be seen as a result of two factors. First, Schaeffer (1997) noted that 2-year-olds only rarely use adverbials. Second, the percentage of nonscrambling in 2-year-olds is 70%. Consequently, the chance of finding nonscrambled orders first is much greater than the chance of finding scrambled orders. A more detailed survey reveals that, at least for definite DPs, scrambling and nonscrambling appear more or less simultaneously. For Laura, we found a delay of more than a month in our search. For Sarah, however, we found that the scrambled order is present before the nonscrambled one.

- c. Ziet mij praten.
sees me talk
(Sarah, 2;5)
- d. Ik ziet een kussen liggen.
I see a pillow lie
(Sarah, 2;8)

The prediction for English is that ECM will appear with all classes of ECM verbs. This prediction is in accordance with the facts. ECM in English is much more frequent than it is in Dutch, and it occurs with verbs that have Dutch counterparts both requiring and not requiring verb raising (see Radford (1990) for some discussion). Examples are given in (45) and (46) respectively:

- (45) a. Let me see.
(Peter, 1;11)
 - b. Wanna see me walk on the horsie.
(Peter, 2;9)
 - c. Wanna see me take em out now.
(Peter, 2;9)
 - d. Hear him make noise.
(Peter, 2;10)
 - e. You see little spider go.
(Shem, 2;3)
 - f. Let me see you drum here.
(Shem, 2;6)
- (46) a. Am gonna get a horsie see it.
(Peter, 2;1)
 - b. Want me get it.
(Peter, 2;3)
 - c. Want em to fall down.
(Peter, 2;8)
 - d. I want you to go eat it.
(Shem, 2;3)
 - e. I want Shem do it now.
(Shem, 2;3)
 - f. I want you to have another one.
(Shem, 2;11)

A further prediction is that children will treat verb-particle constructions differently in Dutch and English. It is to be expected that in English, Case theory will trigger separation of the particle and the verb from the start, whereas in Dutch, particles should systematically appear adjacent to the verb. This seems to be

correct. A search in the Dutch corpora for typical particles and resultatives shows that only sentences of the type in (47) are produced; crucially, sentences in which a particle is not adjacent to the verb (or the verb's trace in the case of verb second) are absent and have not been reported in the literature (Bennis, den Dikken, Jordens, Powers, and Weissenborn (1995)).¹⁹

- (47) a. Nog 'n bord ook opeten.
still a plate also up-eat
(Thomas, 2;7)
- b. Ditte nu opete.
this now up-eat
(Hein, 2;5)
- c. Even blokjes uithale.
quickly blocks out-take
(Laura, 2;9)
- d. Eve zo zak ope hou.
for a while thus sack open hold
(Laura, 2;9)
- e. Ga sap afpakke.
go juice away-take
(Sarah, 2;4)

English children show a more complex development. Hyams, Johnson, and Schaeffer (1993) and Snyder and Stromswold (1997) showed that English children first go through a stage in which particles occur to the right of the object:

- (48) a. I wanna get the paint off.
(Michael, 2;4)
- b. S'more put my diaper on.
(Michael, 2;5)

Next, children seem to acquire the alternative order V-Prt-NP. In this stage, orders like those in (49) are attested alongside those in (48) (examples from Hyams et al. (1993)):

- (49) a. A scraper gets off a little bit of sauce.
(Michael, 2;11)

¹⁹There is some discussion of whether particles in Dutch form a lexical unit with the verb. If they do, they will not project, and hence they do not directly bear on the issue of case adjacency. However, resultatives in Dutch also form a complex predicate with the verb, and these elements clearly do project (cf. Neeleman and Weerman (1993a)). The fact that resultatives, like particles, appear adjacent to the verb corroborates the analysis in the main text. In order to avoid potential problems with particle constructions, we considered resultatives as well as particles where acquisition is concerned.

- b. Y'know he's beatin up the pony.
(Sarah, 4;10)

This development shows that VP shell formation is triggered as soon as particle verbs are present in the child, as expected under our approach.

The fact that the order V-Prt-NP is acquired later on also follows on the assumptions made in section 2.2. As argued there, VP shell formation is obligatory if the particle is an XP and blocked (by economy) if it is an X⁰. The data suggest that children start with the hypothesis that particles are XPs. This is to be expected, as particles occupy a syntactic position, which entails that they must project, unless the verb and the particle form a lexical unit. As a result, the child may only leave the particle *in situ* (i.e., analyze it as a head) if such an additional lexical stipulation is made. As this is a further learning task, it follows that the V-Prt-NP order is acquired later than the V-NP-Prt order and that this order is learned for each verb-particle combination separately.²⁰

These data suggest that there is some delay in the occurrence of verb-particle constructions when compared to the first occurrence of verb-object constructions. The reason for this is rather straightforward. The child must be able to generate complex heads in order to generate verb-particle constructions. The claim that the ability to generate complex heads is a prerequisite for generating verb-particle constructions has been made earlier by Snyder (1996), who pointed out that in English there is a strong correlation between the first occurrence of nominal compounds and the first occurrence of verb-particle constructions. The mean age at which verb-particle constructions are acquired in English is 2;2. This is also the age at which the first novel nominal compounds are produced (Snyder (1996, 732–733)).

We believe a similar correlation holds in Dutch. Lohuis-Weber and Zonneveld (1996) showed that Joost uses the first nominal compounds around age 2;1 and that compounding is a productive process from then on. In the same period Joost acquires verb-particle constructions. According to Bennis et al. (1995), Joost's first use of a verb-particle construction is at age 2;0 and Wim Zonneveld (personal communication, August 31, 1997) informed us that from then on such constructions appear productively.

We finally turn to extraction from objects of particle verbs. Recall that this type of extraction is blocked if a VP shell is formed. Hence, it occurs freely in Dutch but not in English (cf. (33) and (34)). Because these constructions are rather complex, they do not occur in early stages of development. This means that we cannot directly test whether knowledge of subextraction is acquired simultaneously with basic word order. Nevertheless, it must be the case that speakers do not acquire knowledge about these constructions directly, but rather

²⁰Presumably, Dutch children also start by analyzing particles as maximal projections, but this does not lead to a different word order for reasons spelled out in section 2.

as a result of the setting of an independent parameter. Precisely because of the complexity of these constructions, it is unlikely that they will be part of the input. In fact, learning the English paradigm would require negative evidence.

To conclude, the child language data agree with the parameter that we have proposed. Of course, the evidence in favor of the parameter presented in this section differs from the evidence we used to construct the parameter. By necessity it is less direct because, for independent reasons, the various effects of the parameter do not show up simultaneously. Limitations on computational capacity, for example, have the consequence that, whereas knowledge about basic word order can be observed from the very first stages, the related phenomena can only be observed if more complex structures can be handled. What the child language data do show, however, is that certain mistakes are never made. This can be explained if the relevant data are not learned separately, but rather as the consequence of the setting of an independent parameter, here the OV/VO parameter.

3.2. Second-Language Acquisition

The conclusion that parameters are accessible to L1 learners is, of course, not disputed. For L2 acquisition, however, there is a controversy. As already mentioned, some linguists argue that the resetting of parameters is responsible for L2 acquisition, whereas others argue that parameters are accessible in the critical period only and that L2 acquisition involves the positing of construction-specific rules guided by general learning strategies.²¹

Obviously, the discussion about the accessibility of parameters in L2 can only be held if non-construction-specific parameters are available. Only in that case do the various theories on L2 acquisition make different predictions. If parameters are indeed accessible to L2 learners, the implicational relations between knowledge of one construction and knowledge of another, as we claim exist in L1 acquisition, is expected to re-occur in L2 acquisition. If parameters are not accessible the relevant phenomena should all be learned separately, in contrast to L1 acquisition (Bley-Vroman (1990), White (1985)).

In order to find out which prediction is correct, we have developed a test for four groups of speakers: two control groups of Dutch and English native speakers and two groups of second-language acquirers—Dutch learners of English and English learners of Dutch, respectively. The English control group and the group of English learners of Dutch each consisted of 14 participants. The Dutch control group and the group of Dutch learners of English each comprised 15 participants. The participants with a Dutch background were pupils in the 1st year of secondary

²¹The latter view of L2 acquisition raises the question as to which age the critical period extends. The data collected by Johnson and Newport (1989) show that language learning rapidly changes in character after about age 7. This suggests that for the majority of learners the critical period ends then.

school (with an age between 13 and 14). They had received approximately 1 year of training in English (2 hr a week plus homework). The English learners of Dutch were of the same average age; they were pupils from an international school who had been in the Netherlands for a period between 1 and 8 years. They received explicit training in Dutch (3 hr a week plus homework). The English control group participants were adult speakers of various ages.²²

The test was a written judgment test. It was explained to the participants that they should give grammaticality judgments and not judgments concerning the truth value or plausibility of a sentence. Care was taken that simple language was used in the test, and the participants were told that they could ask for clarification of the meaning of lexical items. There was no time limitation for completion of the test. For each of the five constructions related to the parameter (OV/VO order, distribution of particles, scrambling, ECM, and extraction from objects of complex predicates) 12 sentences had to be judged. So, the two tests each contained 60 sentences that were presented in random order. The participants were asked to correct ungrammatical sentences where possible, so that there was an indication whether the sentences were rejected for the relevant reasons. They were also asked not to insert or leave out lexical items when correcting ungrammatical sentences (an instruction not always followed).

An example of an item relevant to case adjacency is (50). The sentence is judged ungrammatical and corrected in the right way.

- (50) Andrea is reading slowly the newspaper.
 CORRECT
 ✓ INCORRECT
 CORRECTION: Andrea is reading the newspaper slowly.

Sometimes a sentence was judged ungrammatical for the wrong reasons, but in that case the corrected version shows this, as can be seen in (51). Because the sentence was meant to test knowledge about adverbial placement, the item got a positive score.

- (51) My mother is going to repair her bike tomorrow.
 CORRECT
 ✓ INCORRECT
 CORRECTION: My mother goes to repair her bike tomorrow.

²²All test groups, then, are of comparable age, except for the English control group. This seems unproblematic because all individuals are outside the critical period. Moreover, the scores of the Dutch and English control groups are essentially the same. The overall score on all constructions was 95% for the Dutch control group and 94% for the English control group (see Tables 2 through 5 and Appendix B for further information).

In (52), however, the correction is relevant, as it shows that the speaker treats DPs and PPs alike with respect to case adjacency. Therefore, this item got a negative score.

- (52) David talked softly to Donna.
 CORRECT
 ✓ INCORRECT
 CORRECTION: David talked to Donna softly.

Consider as a final example (53), which is taken from the Dutch test. (Of course, the example was not glossed in the test.)

- (53) Gelukkig heeft de man de auto op tijd gezien.
 fortunately has the man the car in time seen
 CORRECT
 ✓ INCORRECT
 CORRECTION: Gelukkig, de man heeft op tijd
 fortunately, the man has in time
 de auto gezien.
 the car seen

In this case the speaker incorrectly judged the sentence as ungrammatical, and she corrected the sentence in two ways. First, the topicalized adverbial is reanalyzed as a left-hand satellite. This is irrelevant for the purpose of our test. Second, the adverbial *op tijd* 'in time' and the object appear in reversed order. This is relevant, as it shows that the speaker rejects scrambling. Hence, the sentence got a negative score.

For all constructions we tried to balance the number of grammatical and ungrammatical test sentences to control for response biases. With two constructions this was impossible, as the test sentences necessarily were grammatical. As we have seen in section 2, scrambling in Dutch is possible but not obligatory and extraction of particle verbs is always allowed. For these categories ungrammatical English test sentences can easily be constructed. Appendix A contains examples of test items for all constructions.

Sentences that were judged incorrectly by a majority of the speakers in the control groups or that appeared to be suspicious for other reasons (namely, unforeseen ambiguities) were removed from the final test results. For the Dutch test this means that 3 sentences were ignored, whereas 5 sentences were omitted from the English test. In no case did omission affect more than 2 sentences from a single category, so that at least 10 sentences per category remained.

Although a score of 100% was achieved for most constructions by most participants in the control groups, lower scores occurred occasionally, as can be concluded from Tables 2 and 3. In these tables PRT stands for the placement of

TABLE 2
English Control Group

<i>VO</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
98%	97%	93%	96%	89%

TABLE 3
Dutch Control Group

<i>OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
100%	100%	96%	91%	90%

particles and particle-like elements with respect to the verb and the object, *SCR* for scrambling/case adjacency, *ECM* for Exceptional Case Marking and *EX* for extraction from the object of a particle verb (or another complex predicate).²³ We assume that deviations from the perfect score are due to performance factors and other variables that are not under our control. A speaker might accept an ungrammatical sentence because he or she can assign a pragmatically plausible interpretation to it or because he or she is simply confused. Of course, such factors are irrelevant from our perspective and hence we should somehow correct for their influence when considering the test results. In order to do so, we assume that a speaker has knowledge of a particular construction if he or she reaches a score of 75%. This is represented in Tables 4 and 5 by a “+” (for “presence of knowledge”) or a “-” (for “absence of knowledge”). We refer to the participants by means of an alphabetical character. Apparently not all intervening variables are neutralized by the 75% criterion, as some cells contain a “-.” However, it is clear that the control groups performed very well on our tests, and hence these tests provide a valid measure of knowledge of the relevant constructions.

The results of the L2 acquisition groups are presented in Tables 6 and 7. Again the tables are obtained by abstraction through the 75% criterion, indicating knowledge or absence of knowledge of the relevant constructions.²⁴ It is quite clear that there is no direct relation between knowledge of basic word order and knowledge of the related constructions. Generally, speakers have knowledge of basic word order but do not have a comparable score on the other test sentences.

We first turn to the Dutch learners of English. The most telling cases in Table 6 are Participants B and M, who did know that English is a VO language but failed on all the other constructions. There are also participants that master basic word order as well as one or more of the other constructions, but none of the participants masters all of them. Finally, Participants F and N, who perform well

²³See Appendix B for the scores per participant.

²⁴See Appendix B for the scores per participant.

TABLE 4
English Control Group

	<i>VO</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	+	+	+	+	+
B	+	+	-	+	+
C	+	+	+	+	+
D	+	+	-	+	+
E	+	+	+	+	+
F	+	+	+	+	+
G	+	+	+	+	+
H	+	+	+	+	+
I	+	+	+	+	+
J	+	+	+	+	+
K	+	+	+	+	+
L	+	+	+	+	+
M	+	+	+	+	+
N	+	+	+	+	+

Note. VO = verb object order; PRT = placement of particles and particle-like elements with respect to the verb and the object; SCR = scrambling/case adjacency; ECM = Exceptional Case Marking; EX = Extraction from the object of a particle verb (or another complex predicate).

TABLE 5
Dutch Control Group

	<i>OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	+	+	+	+	+
B	+	+	+	+	-
C	+	+	+	+	+
D	+	+	+	-	+
E	+	+	+	+	+
F	+	+	+	+	+
G	+	+	+	+	+
H	+	+	+	+	+
I	+	+	+	-	+
J	+	+	+	+	-
K	+	+	+	+	+
L	+	+	+	+	+
M	+	+	+	+	+
N	+	+	+	+	+
O	+	+	+	+	+

Note. OV = object verb order; PRT = placement of particles and particle-like elements with respect to the verb and the object; SCR = scrambling/case adjacency; ECM = Exceptional Case Marking; EX = extraction from the object of a particle verb (or another complex predicate).

TABLE 6
Dutch Learners of English

	<i>VO</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	+	-	+	-	-
B	+	-	-	-	-
C	+	-	+	-	-
D	+	-	-	+	-
E	-	-	-	-	-
F	-	-	-	+	-
G	+	+	+	+	-
H	+	-	+	+	-
I	+	-	+	+	-
J	+	-	-	-	-
K	+	+	+	+	-
L	+	-	+	-	-
M	+	-	-	-	-
N	-	-	+	-	-
O	+	-	+	+	+

Note. VO = verb object order; PRT = placement of particles and particle-like elements with respect to the verb and the object; SCR = scrambling/case adjacency; ECM = Exceptional Case Marking; EX = extraction from the object of a particle verb (or another complex predicate).

TABLE 7
English Learners of Dutch

	<i>OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	-	-	-	-	-
B	-	-	+	-	-
C	+	+	+	-	-
D	+	-	+	-	-
E	+	+	-	-	-
F	+	-	-	-	-
G	+	+	+	-	+
H	+	+	+	-	-
I	+	+	+	-	-
J	+	-	+	-	-
K	+	-	+	-	-
L	+	-	+	-	-
M	+	+	+	-	+
N	+	+	+	-	-

Note. OV = object verb order; PRT = placement of particles and particle-like elements with respect to the verb and the object; SCR = scrambling/case adjacency; ECM = Exceptional Case Marking; EX = extraction from the object of a particle verb (or another complex predicate).

TABLE 8
Proportion of Successful Participants

	<i>VO/OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
English control group	14/14	14/14	12/14	14/14	14/14
Dutch control group	15/15	15/15	15/15	13/15	13/15
Dutch learners of English	12/15	2/15	9/15	7/15	1/15
English learners of Dutch	12/14	7/14	11/14	0/14	2/14

Note. *VO/OV* = verb object/object verb order; *PRT* = placement of particles and particle-like elements with respect to the verb and the object; *SCR* = scrambling/case adjacency; *ECM* = Exceptional Case Marking; *EX* = extraction from the object of a particle verb (or another complex predicate).

on one of the other constructions, but do not master basic word order, also show that there is no relation between one and the other in L2 acquisition of English.²⁵

Similarly, English learners of Dutch show that there is a dissociation of knowledge of *OV* order and knowledge of the related constructions. Most speakers have knowledge of one or more of the other constructions in addition to basic word order, but, again, none of them masters all five constructions. The most extreme example is Participant F, who fails on everything but basic word order. The reverse also happens. There is one participant, B, who has not acquired basic word order yet, although he does know that Dutch is a scrambling language.²⁶

The results are summarized in Table 8, where the number of participants that master a particular construction is compared with the total number of participants that took the relevant test. All groups have a rather good control of basic word order, but there is a striking contrast with respect to the other constructions. Where the control groups have a constant high score, there is a large variation and overall low scores in the L2 acquisition groups.

Another summary of the test results is presented in Table 9, where the percentage of speakers that mastered both basic word order and the related constructions is provided. As can be seen, the control groups ended up with a high percentage. The L2 groups, however, had a percentage of zero. On the assumption that the *OV/VO* parameter proposed here is correct, and on the assumption that parameters are accessible to L2 acquirers, one would expect rather different

²⁵An anonymous reviewer suggested that another interpretation is possible for the low performance of the Dutch L2 acquirers on scrambling, even for those who performed well on *VO*. This suggestion is that the *OV/VO* parameter has been set correctly but that the participants incorrectly assumed that English has *V-to-I* or *V-to-C*. To control for this, we included several sentences where the crucial verb is an infinitive (i.e., (50 and 51)). The scores on these sentences do not deviate from the other sentences.

²⁶Note that the scores on scrambling are comparably high. This might be due to the explicit training in Dutch adverbial placement (i.e., scrambling constructions) that is part of the L2 acquisition courses taught to the participants. In addition, a response bias may have played a role here, because, as explained before, all test sentences were grammatical.

TABLE 9
Percentage of Participants with a Perfect Score

	<i>English Test</i>	<i>Dutch Test</i>
Dutch participants	0	73
English participants	86	0

results. In that case, there should be an overall match between the results for basic word order and the results for other constructions. In other words, one would expect the proportion of successful L2 participants in the first column of Table 8 to be comparable to proportions in the other columns, as is the case for the control groups. Similarly, one would expect the percentage of L2 participants with a perfect score in Table 9 to be much higher, given the high percentage that has already acquired basic word order (i.e., reset the parameter).

If L2 acquisition does not involve parameter resetting, however, the results one expects are pretty much the results found in the test. Basic word order and the constructions related to it are acquired independently in L2 acquisition, and therefore knowledge of one of these constructions should not imply knowledge about the others. As Tables 6 through 9 show, this is indeed the case. Moreover, there is a lot of individual variation in the extent to which the various constructions have been acquired. This is expected if L2 acquisition involves the positing of construction-specific rules.

One may try to defend the Parameter Resetting Theory by attributing the lack of clustering in L2 acquisition to independent factors. Of course, this is only possible if there is independent evidence for the relevance of such factors. As far as we can see, such independent evidence does not exist, however. Whereas it is likely that computational complexity affects child language, this cannot be the case with L2 acquirers. L2 acquirers, being adults, obviously do not suffer from short-term memory limitations. The speakers are perfectly able to handle sentences of large complexity in their mother tongues, and therefore defects in their second language must be defects in knowledge. This is corroborated by the fact that speakers are in principle able to handle complex constructions in their second language. Participant O in Table 6, for example, shows knowledge of such complex constructions as subextraction and ECM, but has not yet mastered the relatively simple syntax of English particles. So, if L2 learners perform poorly on constructions related to OV/VO word order, the parameter resetting approach forces one to assume that this is due to language-internal factors: There should be principles in the target grammar that interact with the OV/VO parameter and that are not mastered yet by the speakers. As we explain later, there are no plausible independent factors of this type.

In the case of scrambling one may think that discourse conditions may affect performance on scrambling. Although there is a relation between scrambling and

specificity, as already mentioned in section 3.1, this can hardly explain the test results. Scrambling is ruled out in VO languages, and this grammatical limitation cannot be overruled by a discourse principle. So, if Dutch learners of English violate case adjacency, this shows that they do not have access to the parameter. Similarly, the absence of the appropriate discourse principle in English learners of Dutch cannot explain their errors. The point is that the discourse principle filters out certain options allowed by the grammar, which implies that its absence should lead to greater leniency. The errors made by the English speakers, however, typically involved rejection of grammatical sentences (cf. (53)).

Recall that in the case of particle verbs, delay in first-language acquisition seems to be related to the acquisition of complex heads. Obviously, verb-particle constructions can only be generated if complex head structures are available. Because both Dutch and English allow complex heads, it does not seem very likely that this factor affects the performance of L2 acquirers, at least not on a resetting view of L2 acquisition.

Finally, consider what may cause difficulties in acquiring ECM constructions. It is true that for this construction an independent grammatical factor may come into play. The theory of case checking predicts that ECM is a limited phenomenon in OV languages, whereas it is more generally available in VO languages. Because not every VO language has ECM, however, there must be a further conditioning factor. This means that the poor performance of Dutch learners of English on ECM may be because they have not mastered this further factor yet. This independent factor cannot explain the poor performance of English learners of Dutch, however. They typically overgeneralize ECM to constructions without clause union, and such overgeneralizations are unexpected if L2 learners have access to the OV/VO parameter. Thus, whereas the Dutch learners of English provide weak evidence against parameter resetting in the case of ECM constructions, the evidence provided by the English learners of Dutch is quite strong.²⁷ From this perspective it is striking that none of the English learners of Dutch mastered ECM (see Table 7).

So, it seems hard to reconcile the parameter resetting approach with the lack of clustering in L2 acquisition by appealing to independent factors. At least in the case of the OV/VO parameter, there are no plausible factors that could cause a delay for the constructions related to OV/VO word order.

There might be another option to reconcile the parameter resetting view with the L2 test results. Recall that the language acquirer must both determine the domain and the direction of the case checking. OV order and a syntactic definition of the checking domain are related by logical necessity; VO order and a prosodic

²⁷Of course, if the independent factor has been identified, the evidence by the Dutch learners of English may turn out to be stronger than it appears. In footnote 15, we argued that ECM is available in VO languages when the inflectional node of the embedded clause is lexicalized. If this is indeed the crucial factor, the presence of *to* in English should allow L2 learners to realize ECM in all contexts where it is potentially available.

definition are related by economy. Suppose now that the implicational relation between the two parametric choices is disturbed in L2 acquisition—for instance, because L2 learners (for some reason or other) cannot use economy as a guiding principle in parameter setting (cf. the discussion of the Subset Principle in White (1989)). If so, one may expect difficulties for Dutch learners of English, who may stick to a syntactic definition of the checking domain, even after acquiring VO order.

This hypothesis is not sufficient to explain the data, however. Note first that it does not extend to the English learners of Dutch. Because OV order and phonological checking are logically incompatible, it is impossible for an L2 learner of Dutch to stick to his or her original specification of the checking domain once OV order has been acquired. Consequently, the difficulties such learners face remain unexplained. For the Dutch learners of English, a different problem remains. Even if economy is not available as a guiding principle, one would expect clustering of the phenomena related to the choice of the checking domain (i.e., all phenomena except basic word order). This type of clustering also does not occur. Many speakers have knowledge of one or two of the related phenomena and fail on the others. The most telling cases are Participants A, C, and L, who know that the object and the verb must be adjacent. If L2 acquisition is parameter resetting, this implies that they have correctly defined the checking domain in prosodic terms. Nevertheless, Participants A, C, and L do not master any of the other phenomena related to prosodic checking.

The test results suggest, then, that in L2 acquisition parameters are not accessible, at least not directly: In contrast to what we have seen for L1 acquisition, knowledge of basic word order does not imply knowledge of related phenomena. One way to understand these results would be to say, following Clahsen and Muysken (1986; 1989), that L2 acquisition involves the positing of construction-specific rules guided by general learning strategies. As an anonymous reviewer pointed out, this would tie in with the claim made in Clahsen (1991) and Müller (1994) that, even in L1 acquisition, parameters cannot be reset. If parameter resetting is impossible in L1 acquisition, one would expect things to be similar in L2.

4. CONCLUSION

In this final section we briefly discuss two implications of the view of parameters defended here, the first concerning L2, the other L1.

To begin with, let us consider which views of L2 acquisition are compatible with the results of our test. What must minimally be true is that parameters are not directly accessible to L2 learners. This leaves room for several theories. One could assume that UG is not accessible at all and that L2 acquisition completely depends on general learning strategies (Clahsen and Muysken (1986)). Alternatively, one might say that UG is available indirectly, namely via the L1 grammar,

and that in L2 acquisition the patterns provided by the L1 system are input to overriding construction-specific rules (Clahsen (1990), Clahsen and Muysken (1989)). A third option is that UG is directly available to L2 learners but that parameters, once set, cannot be used anymore in acquisition. This means that the effects of the parameter must be mimicked by construction-specific rules (cf. the position of Schachter (1988; 1990)). The conclusion that seems to be warranted, then, is that L2 acquisition involves the positing of construction-specific rules, guided by general learning strategies. The degree to which UG plays a role in this process cannot be decided on the basis of the data presented in this article.

If L2 acquisition crucially involves construction-specific rules and general learning strategies, individual differences in the success and rapidity of L2 acquisition can be understood more easily. As is well known, there is a striking contrast in this respect with the uniform results of L1 acquisition (Bley-Vroman (1990)). The individual differences between L2 learners can also be observed in our test. At least for the English participants there does not seem to be a clear relation between the length of their stay in the Netherlands and their knowledge of Dutch. Speaker E in Table 7, for instance, has been in the Netherlands for 8 years and she only has acquired basic word order and particle placement. Speaker N, in contrast, has only been in the Netherlands for 1 year and she has already acquired scrambling in addition to particle placement and basic word order. During their stay in the Netherlands, both speakers received approximately 3 hr of explicit training in Dutch per week.

We now consider the properties of the construction-specific rules required in all alternatives. It is necessary that these rules are sensitive to structural rather than linear properties, because near-native knowledge can be achieved by L2 learners. Note that the structural nature of L2 rules by itself cannot be used as argument for the accessibility of UG. Sensitivity to structural properties is, in fact, also visible in other domains. Learning mathematics, for instance, involves acquisition of structural rules, as is shown by the fact that in an algebraic string, groups of symbols must be recognized. Similarly, the generative nature of the construction-specific rules comes as no surprise. Again, in learning mathematics a rule system is internalized on the basis of a limited input that allows an infinite number of new problems to be solved.

Evidence presented in Smith, Tsimpli, and Ouhalla (1993) corroborates that L2 acquisition indeed involves structural rules that are not directly related to UG. In the context of a larger investigation, Smith et al. asked participants to learn an artificial language that has properties which are in conflict with UG and which are not attested in any known natural language. To give one example, negation in this language was achieved by topicalization rather than by insertion of a negative element. It turned out that adults were remarkably successful in acquiring this language. On the assumption by Smith et al. that the relevant rules violate UG, this success cannot be due to parameter resetting. Hence, what must be involved here are structural rules acquired on the basis of general learning strategies.

As this example shows, it must be assumed in any theory that structural rules can be construed through general learning strategies. If such rules are motivated in other domains of cognition, it comes as no surprise that they play a role in L2 acquisition. So, a perspective on L2 acquisition that involves general learning strategies does not imply that ad hoc entities must be introduced. In this sense, such a theory is not to be preferred or dispreferred a priori over a theory of parameter resetting. The matter is an empirical one, and as we have seen, the test results do not seem to support the resetting view.

In addition to the linguistic argumentation presented in this article, there is some neurological evidence for a distinction between L1 and L2 acquisition. Recently, Kim, Relkin, Lee, and Hirsch (1997) used functional magnetic resonance imaging to determine the spatial relation in the human cortex between languages acquired in childhood and languages acquired by adults. What they found was that

within the frontal-lobe language-sensitive regions (Broca's area), second languages acquired in adulthood ("late" bilingual subjects) are spatially separated from native languages. However, when acquired during the early language acquisition stage of development ("early" bilingual subjects) native and second languages tend to be represented in common frontal cortical areas. (p. 171)

Interestingly, this difference in the representation of second languages acquired by children and adults does not occur in the temporal-lobe language-sensitive regions (Wernicke's area). This may tie in with claims defended in this article. In general, Broca's area appears to be more closely associated with structural linguistic knowledge than Wernicke's area. It is possible, then, that the age of acquisition primarily affects the representation of structural knowledge of a second language, something that would be expected if parameters are not accessible after the critical period.

We finally turn to L1 acquisition. Alongside the general learning strategies, a child has at his or her disposal a specific linguistic learning system containing preprogrammed principles and parameters. In this respect, acquiring linguistic knowledge differs from, for instance, learning mathematics or physics, for which no specialized learning strategy seems to be available. As argued before, there is reason to believe that knowledge of many constructions is related to each parameter. If language acquisition is parameter setting, one might therefore expect children to take giant steps. In practice, however, language development is much more gradual. Although there are leaps, these are rather local. Verb-second, for example, is acquired in a very short period of time (Ruhland, Wijnen, and van Geert (1995)), but this involves knowledge of only a single construction.

For the OV/VO parameter there is a simple solution to this problem. As we have seen, the OV/VO parameter is set at a very early stage. This means that knowledge of related complicated constructions is already acquired then. Inde-

pendent factors have the effect, however, that not all knowledge can be put into practice. Limitations on computational capacity, for instance, have the consequence that conditions on extraction have no overt reflex in early stages.

More generally one may hypothesize that central parameters are set very early. If this is so, the development observed in children is mainly the result of such factors as lexical learning and short-term memory extension. This would provide an explanation for the graduality of language development, while the advantages of the parameter model are maintained. Parameter setting is perhaps more instantaneous than usually assumed.

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APPENDIX A

Examples from the Dutch L2 test

OV/VO ORDER

- Ik heb de poes gezien. (correct)
 I have the cat seen
 Moeder wil schrijven het briefje morgen. (incorrect)
 mother wants to write the letter tomorrow

PLACEMENT OF PARTICLES

- Het meisje wil haar vriendin terug bellen. (correct)
 The girl wants her girlfriend back call
 Kevin zal schoon het raam maken. (incorrect)
 Kevin will clean the window make

SCRAMBLING/CASE ADJACENCY

- Natascha moet iedere dag haar huiswerk maken. (correct)
 Natascha must every day her homework do
 Olga heeft het boek langzaam gelezen. (correct)
 Olga has the book slowly read

EXCEPTIONAL CASE MARKING

- Katrien hoort ons lachen. (correct)
 Katrien hears us laugh
 Mijn broertje verwacht Mandy te komen. (incorrect)
 my brother expects Mandy to come

EXTRACTION FROM THE OBJECT OF A COMPLEX PREDICATE

Dat is de poes waar Luuk foto's van
that is the cat that Luuk pictures of
weggegooid heeft. (correct)
away-thrown has

Wat heeft het jongetje voor speelgoed
what has the boy for toys
in de prullenback gegoooid? (correct)
in the dustbin thrown

Examples from the English L2 test

OV/VO ORDER

David wants to finish his homework. (correct)
I think I have that cat seen before. (incorrect)

PLACEMENT OF PARTICLES

Steve will paint the door black. (correct)
The barman kicked right out the man. (incorrect)

SCRAMBLING/CASE ADJACENCY

My father will wash his car tomorrow. (correct)
Andrea is reading slowly the newspaper. (incorrect)

EXCEPTIONAL CASE MARKING

The teacher expects us to do our homework. (correct)
Brenda wants very much Kelly to be her best friend again. (incorrect)

EXTRACTION FROM THE OBJECT OF A COMPLEX PREDICATE

What did Cindy cut open a box of? (correct)
What did you send a message about back? (incorrect)

APPENDIX B

In this appendix we give the percentage of correct answers per participant and per construction. In the tables, PRT stands for the placement of particles and particle-like elements with respect to the verb and the object, SCR for scrambling/case adjacency, ECM for Exceptional Case Marking and EX for extraction from the object of a particle verb (or another complex predicate). See the main text for further discussion.

TABLE 1A
English Control Group (%)

	<i>VO</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	100	100	100	100	90
B	100	86	67	80	80
C	92	100	100	100	80
D	100	100	75	100	80
E	100	100	92	100	100
F	100	88	100	90	90
G	100	100	100	100	90
H	100	90	100	100	100
I	100	100	100	100	100
J	100	100	83	100	90
K	92	100	100	90	80
L	92	100	100	100	90
M	100	100	92	90	80
N	100	100	100	100	80

TABLE 1B
Dutch Control Group (%)

	<i>OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	100	100	100	90	100
B	100	100	92	100	64
C	100	100	100	90	82
D	100	100	100	60	100
E	100	100	92	100	91
F	100	100	83	100	82
G	100	100	100	100	91
H	100	100	100	80	100
I	100	100	92	50	100
J	100	100	92	100	73
K	100	100	92	90	100
L	100	100	100	100	82
M	100	100	92	100	100
N	100	100	100	100	100
O	100	100	100	100	91

TABLE 1C
Dutch Learners of English (%)

	<i>VO</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	83	36	92	70	50
B	100	64	58	70	50
C	100	73	83	50	40
D	83	64	58	80	20
E	67	27	67	30	10
F	75	73	67	80	20
G	100	82	83	90	50
H	100	73	92	100	40
I	100	73	92	80	70
J	83	73	50	70	20
K	100	90	83	80	60
L	92	82	93	70	20
M	83	45	58	70	50
N	58	73	83	70	40
O	100	73	92	80	80

TABLE 1D
English Learners of Dutch (%)

	<i>OV</i>	<i>PRT</i>	<i>SCR</i>	<i>ECM</i>	<i>EX</i>
A	67	33	58	30	36
B	67	36	92	40	55
C	83	92	100	40	73
D	83	36	100	30	55
E	92	90	67	50	55
F	92	64	67	50	36
G	92	82	92	60	91
H	83	80	92	50	55
I	100	92	100	70	64
J	92	75	92	20	73
K	83	67	100	30	73
L	83	75	92	40	36
M	100	100	100	70	91
N	92	92	83	70	40