Agreement and null subjects in German L2 development: new evidence from reaction-time experiments*

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In L1 acquisition research, developmental correlations between superficially unrelated linguistic phenomena are analysed in terms of clustering effects, resulting from the setting of a particular parameter of Universal Grammar (UG). In German L1 acquisition, there is evidence for a clustering of the acquisition of subject-verb agreement and the decrease of (incorrect) null subjects. The developmental connection between these two phenomena in L1 acquisition has been interpreted in terms of parameter setting. Vainikka and Young-Scholten (1994) have claimed that the acquisition of subject-verb agreement and non-pro-drop in adult L2 learners developmentally coincides in the same way as it does in child L1 learners. This is taken to indicate that UG parameters are fully accessible to adult L2 learners. In this article we will report on reaction-time (RT) experiments investigating subject-verb agreement and null subjects in 33 Korean learners of German and a control group of 20 German native speakers. Our main finding is that the two phenomena do not covary in the Korean learners indicating that (contra Vainikka and Young-Scholten) properties of agreement and null subjects are acquired separately from one another, rather than through parameter resetting.

I Introduction

The idea that adult L2 acquisition might be similar in nature to child L1 development was one of the starting points for the systematic investigation of L2 acquisition in the 1970s. At that time a number of researchers (cf. Dulay et al., 1982) observed that L2 learners

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systematically pass through developmental stages, similarly to what had been found for children learning their mother tongue (cf. Brown, 1973). It was concluded that L1 and L2 acquisition are parallel in major ways; the extent of the parallelism, however, was controversial.

In the meantime, the comparative study of L1 and L2 development has generated more complex hypotheses, involving finer and more precise conceptual distinctions (cf. White, 1989). The progress that has been made in recent years is to a large extent a result of various attempts to connect the empirical investigation of language acquisition with concepts and notions from theoretical linguistics, particularly with Chomskyan Universal Grammar (UG). In recent versions of the Chomskyan theory, a distinction is made between two types of UG constraints: 1) UG principles which hold for every language, such as the Empty Category Principle, the case filter, etc.; and 2) a set of options or UG parameters, which have to be filled in by experience (cf., e.g., Chomsky, 1981; Rizzi, 1982). Neither UG principles nor parameters are construction-specific and they have different surface-structure effects. Given this distinction, UG can function as a learning device in two ways. First, the grammars constructed by learners are constrained by UG principles. Secondly, UG parameters guide the acquisition process by making available a number of options to the learner, which once set at the appropriate values have consequences for the overall grammar, not just for one construction. In this way, the UG approach provides a framework to explain developmental connections between seemingly unrelated linguistic phenomena.

One of the major goals of UG-oriented language acquisition research is to determine in what ways the learning device utilized by children for L1 acquisition is still accessible to adult L2 learners. Several L2 acquisition researchers have taken the stance that child and adult learners access UG principles and parameters in much the same way (cf. duPlessis et al., 1987; Flynn, 1987; Martohardjono and Gair, 1993; Thomas, 1993; Eubank, 1992; 1994; Schwartz and Sprouse, 1994), but despite the accumulation of new data and models in recent years, it has proved difficult to resolve this question (cf. Claassen and Muysken, 1989; Meisel, 1991; Schachter, 1991, among others, for opposing views). Two approaches are discussed most extensively in current research:

1) The strong UG view: In L1 and L2 acquisition, both UG principles and UG parameters function as acquisition devices, and L1/L2 differences result from other factors, e.g., from language transfer.
2) The weak UG view: Whereas child L1 learners have full access to UG parameters, in adult L2 acquisition access to UG parameters has been lost, and UG principles are present only through the L2 learners' first language.

The two approaches make different predictions for grammatical phenomena that fall under UG parameters, and one way of empirically testing them involves three requirements. First, two grammatical phenomena, A and B, which are connected in a UG parameter, P, must be investigated where A is, for example, the trigger for setting B. Secondly, L1 acquisition research has demonstrated that A and B developmentally covary, and that this developmental clustering can be explained in terms of setting the parameter, P, at a particular value. Thirdly, to rule out transfer effects, we must find a group, G, of adult L2 learners which do not have A and B in their native language. If, under these three conditions, one could demonstrate that the two grammatical phenomena, A and B, developmentally coincide in G, parallel to what has been found for child L1 learners, then this parallelism would indicate that the process of parameter setting is operative both in L1 and in adult L2 acquisition, thus supporting the strong UG view. If, however, the acquisition of A and B in G does not co-occur under the three conditions mentioned above, then we have reason to believe that L2 learners acquire A and B separately from one another and that UG parameters are not operative in L2 learners in the same way as in child L1 learners.

Several sets of L2 data have been analysed from the perspective of parameter (re)setting, e.g., backwards versus forwards anaphora (Flynn, 1987), binding of reflexives and anaphors (Thomas, 1993), word order (duPlessis et al., 1987, among others), negation (Schwartz and Tomaselli, 1990), etc. The phenomenon of null subjects has also received considerable attention among L2 acquisition researchers working within the 'principles and parameters' model, for example, by White (1985), Hilles (1991), Lakshmanan (1991), Meisel (1991) and Platt (1993). In these studies it was found that only some of the properties associated with the null-subject parameter cluster developmentally in L2 learners and that the claim that a parametrically related set of properties associated with null subjects emerges at a certain point of L2 development was not borne out by the evidence presented in these studies.

In a recent interesting article, Vainikka and Young-Scholten (1994), using data from Turkish and Korean adult learners of German, claim to have demonstrated that in adult L2 acquisition the correct setting of the null-subject parameter developmentally covaries with the acquisition of subject-verb agreement:
In both first and second language ... learners, the acquisition of agreement
non-pro-drop and obligatory verb raising coincide. The parallelism between
first and second language development ... provides evidence against the
position that adults have no access to the parameters of UG, or that they
only have indirect access through the parameter settings of their first lan-
guage (Vainikka and Young-Scholten, 1994: 295).

Note that the three requirements mentioned above for testing between the strong and the weak UG hypothesis are met in Vainikka and Young-Scholten’s study. They point out that ‘agree-
ment’ and ‘null subjects’ are connected in a UG parameter, and that they developmentally covary in child L1 acquisition of German. Moreover, transfer effects can be excluded in the case of the Korean L2 learners, as Korean does not have subject-verb agree-
ment and is different from German with respect to null subjects.¹
Thus, the parallelism Vainikka and Young-Scholten found between child L1 and adult Korean learners seems to provide rather strong
evidence for the view that UG parameters are fully accessible to adult learners in the same way as they are to children learning their first language.²

In this article we will experimentally test Vainikka and Young-
Scholten’s results by using a reaction-time task with adult Korean
learners of German. We will show that their analysis of their own
data is descriptively inaccurate and that their results could not be replicated experimentally. We will conclude that the experimental
results support the weak UG hypothesis and that they do not pro-
vide evidence for the idea that UG parameters are fully accessible
to adult learners.

The article is structured as follows. We will first briefly describe
the major differences between Korean and German with respect to
null subjects and agreement. We then summarize findings from pre-
vious studies: 1) results on German child language; and 2) results on
L2 acquisition, focusing on Vainikka and Young-Scholten’s (1994)
findings for Korean L2 learners. We next go on to describe the
results of our sentence-matching (SM) experiments, first on native
speakers of German and finally on Korean L2 learners.

¹ Turkish does have subject-verb agreement, and therefore effects of positive transfer cannot
be completely ruled out in the Turkish L2 learners’ acquisition of the subject-verb agreement
paradigm of German.

² Note that Vainikka and Young-Scholten do not take L1 and L2 acquisition to be identical.
Rather, they argue that children and adults may use different triggers for creating new
phrase-structure positions. The crucial point, however, is that ‘...the agreement paradigm
and the setting of the null subject parameter coincide in our data’ (Vainikka and Young-
II Agreement and null subjects in German and in Korean

There is an extensive literature on the two phenomena under investigation which will not be discussed here. Rather, the following remarks are just meant as background information for those unfamiliar with the German or the Korean language.

1 Agreement

Whereas Korean does not have the syntactic property of subject-verb agreement, in adult German the grammatical person and the number of the subject are marked on the finite verb. These features are manifested in terms of suffixes and, at times, in terms of changes in the root vowel. Leaving aside morphological irregularities, such as the suppletive forms of sein (‘to be’), the distribution of the person/number formatives is as follows:

1) Person/number formatives in German (present tense)

<table>
<thead>
<tr>
<th>Person/number</th>
<th>Infinitive</th>
<th>1st sg.</th>
<th>2nd sg.</th>
<th>3rd sg.</th>
<th>2nd pl</th>
<th>1st pl</th>
<th>3rd pl</th>
</tr>
</thead>
</table>

2 Null subjects

Korean is a topic-prominent language which allows empty subjects and objects in main and embedded clauses. These empty arguments are identified by topic chains or by a c-commanding nominal (cf. Huang, 1984). Consider first the identification of empty arguments by topic chains:

2) a. e Ing:-lul sarangha-n-ta
    L.-acc. love-pres.-declarative
    "*loves Inge"

   b. A Peter-ka nukwu-lul sarangha-ni?
P.-nom. who-acc. love-interrog.
    "Who does Peter love?"

   B e Inge-lul sarangha-n-ta
   (= Peter) L.-acc.love-pres.-declarative
    "(Peter) loves Inge"

Sentence (2a) would be grammatical in a pro-drop language such as

3 In colloquial German, the -0 allomorph is used for 1st sg.: ich leb.
Italian. In Korean matrix clauses, however, subjects and objects can only be left out if an appropriate context is given, such as in (2b), in which the empty argument is bound by the subject element in speaker A's question.

In German a similar phenomenon can be found, but only in root clauses. In colloquial German, preverbal subjects can be left out in root clauses with the finite verb in Comp, if the appropriate context is given; this phenomenon is sometimes referred to as topic-drop (cf. 3). There is a controversy in the syntactic literature as to how empty root subjects as in (3) can be analysed. Some syntacticians have argued that these are identified through topic-chains, similar to empty topics in Chinese (cf. Huang, 1984); however, the phenomenon is much more restricted in German than in true topic-prominent languages. In this article we will not investigate empty root subjects (cf. Cardinaletti, 1992, for a recent syntactic analysis).

3) hab das Buch schon gelesen ‘have the book already read’ (I’ve already read the book)

Consider now the identification of empty arguments by c-commanding nominals. With respect to empty subjects in embedded clauses, there is a clear difference between German and Korean: whereas Korean allows empty subjects in embedded clauses, in German empty referential subjects are always ungrammatical in this type of clause; cf. the contrast in (4a) and (4b). Nonargument subjects can, however, be empty in German, even in embedded clauses; cf. (4c) and (4d):

4) a. Peter-ka [e Inge-lul saranha-n-tako] malha-n-ta
   Peter-nom. [ Inge-acc. love-pres.-that] say-pres.-dcl.
   ‘Peter says that (he) loves Inge’
   b. *Peter sagt [daß e Inge liebt]
   c. *... that e seems to me ...
   d. ... daß e mir scheint
      ‘that (it) seems to me . . .’

In Rizzi’s (1986) theory of pro, two parameters are hypothesized to account for the distribution of empty subjects: 1) licensing of pro and 2) identification/recovery of the content of pro. The licensing of the empty subject can be accomplished through government by Infl (or Agr). In English, Infl does not license pro, whereas in German and in Korean it does.

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4 Rizzi (1986) also discusses empty objects, but here the discussion will be restricted to subject pro. See Rizzi (1994) for a recent extension of his theory to cover root null subjects in early child language.
The identification parameter involves complex values. Specifically, whether or not a language identifies the content of pro (Φ-features in Rizzi’s terminology) via person and number features is parameterized. In other words, recovery of features – if there are any – via the licensor Infl/Agr can be in terms of person and number affixes. Rizzi claimed that in languages such as Korean, Φ-features do not exist. Therefore, the empty element ‘e’ in (4a) cannot be properly identified by Φ-features. According to Huang (1984), a c-commanding nominal can identify an empty argument in languages without Agr features, i.e., without Φ-features in the sense of Rizzi (1986). This amounts to saying that ‘e’ in (4a) can be identified by Peter in the matrix clause, and this exactly corresponds to the meaning of (4a). In contrast to Korean, Φ-features exist in languages such as Italian and German. For these languages, UG offers two options. If Infl (or Agr) has the feature [+pronominal], pro is identified via head binding (cf. Rizzi, 1986: 520ff.) and receives a thematic role. This allows pro to be used just like a definite pronoun as in the so-called pro-drop languages, such as in Italian. If Agr/Infl has the feature [−pronominal], empty referential subjects are impossible such as in German and English. In contrast to English, however, nonargumental subjects which do not have to be specified in terms of Φ-features may be empty in German (cf. (4d) above) as pro is licensed in German, but not in English. In sum, the distribution of empty subjects may be schematized as follows:

5) Null subjects in embedded clauses

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>German</th>
<th>Korean</th>
<th>Italian</th>
</tr>
</thead>
<tbody>
<tr>
<td>licensing of null subjects</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Φ-features exist</td>
<td>+</td>
<td>+</td>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>Agr = [+pronominal]</td>
<td>–</td>
<td>–</td>
<td>X</td>
<td>+</td>
</tr>
</tbody>
</table>

The account of empty subjects in the preceding paragraph gives rise to the question of what it is that Korean learners of German have to acquire, i.e., what parameter values they must change in order to match the German values. The interlanguage must move from a system 1) that does not use Φ-features to one that does; and 2) from a system in which Agr is not specified as either [+pronominal] or [−pronominal], noted as X in (5), to one in which Agr is [−pronominal]. In other words, the tasks of Korean learners of German are: 1) to determine that person and number features exist in German; and 2) to assign Agr the feature [−pronominal].
III Subject-verb agreement and null subjects in German child language

Null subjects have been studied in several studies in German L1 acquisition (Hamann, 1992; Weissenborn, 1992; Whitman, 1992), but in these studies the developmental relationship to the acquisition of subject-verb agreement has not been investigated. The major finding from our L1 acquisition studies is that the acquisition of the subject-verb agreement paradigm developmentally covaries with the systematic use of overt subjects (cf. Clahsen and Penke, 1992; Duffield, 1993).

Clahsen (1991) found that before the acquisition of agreement, the mean proportion of empty subjects is about 40% for Daniel and Mathias, two children studied longitudinally over a period of more than two years. Contrary to the adult language, the children leave out various kinds of thematic subjects in these early phases (consult Clahsen, 1982, for more detailed descriptions). After subject-verb agreement has been acquired, grammatical subjects are explicitly realized in most cases.

Clahsen and Penke (1992) analysed the largest longitudinal corpus available on German L1 acquisition, the Simone-corpus, with similar results. Simone acquires the subject-verb-agreement paradigm between corpora 6 and 10, i.e., between the age of 2:0 and 2:4. Before corp. 6, i.e., in the preagreement stage, the frequencies of empty subjects are relatively high. In sentences with the 3rd pers. sg. suffix -t, for example, the mean proportion of overt subjects is 27% before Corp. 6 (cf. Clahsen and Penke, 1992: 208). From Corp. 10 on, i.e., after the subject-verb agreement paradigm has been acquired, subjects are more often realized, with percentages ranging from 73% to 92% (cf. Clahsen and Penke, 1992: Table IX, p. 207). The observed differences in the use of overt subjects between the preagreement stage and the later stage (after the agreement paradigm is acquired) are statistically significant $\chi^2(1) = 15.684$, $p < 0.01$, one-tailed, corrected for continuity.

In a recent article that came out of our project, Duffield (1993) presented a more detailed analysis of null subjects in the data from the Simone-corpus. Duffield (p. 22) found that the disappearance of null subjects in root-clause infinitives correlates exactly with the development of the subject-verb-agreement paradigm, thus confirming Clahsen and Penke’s (1992) findings. In addition, he found cases of referential null subjects, even well after the acquisition of the agreement paradigm, namely null subjects in postverbal positions and in embedded clauses. The frequencies of these (ungrammatical) null subjects are, however, rather low, 0 to 4.9% (cf.
Duffield, 1993: Table 29, p. 22), and the significance of these for the child's grammar is not clear.

Clahsen and Penke (1992: 206ff.) analysed the developmental clustering between agreement and null subjects in terms of parameter setting. They argued that before the acquisition of subject-verb agreement, the requirements on the recovery of null subjects are vacuous, as the element that is part of the parameter's triggering condition, namely Agr, has not yet been acquired. The acquisition of subject-verb agreement makes the options of the recovery parameter available to the child, i.e., after the syntactic category Agr has been incorporated into the child's grammar, the child can determine whether Agr is [-pronominal] or [+pronominal]. The child determines that Agr furnishes pro with no Φ-features in German, and pro therefore cannot function as an argument at this and later stages. This accounts for the decrease in the proportion of empty subjects after the acquisition of subject-verb agreement.

**IV Subject-verb agreement and null subjects in L2 acquisition**

In a number of L2 acquisition studies, the developmental relationship between subject-verb agreement and null subjects has been investigated, with varying results. Meisel (1991) analysed the longitudinal corpora from four adult learners of the ZISA research study on Romance learners of German with respect to agreement inflections and the use of lexical subjects. He found a vast amount of intersubject variation with respect to these two phenomena, and he argued that there are no developmental connections. Meisel (1991: 260ff.) compared frequency counts for subject omissions and correct use of subject-verb-agreement affixes over a period of approximately two years for each learner. He observed that the frequencies for both phenomena fluctuate and are not correlated, neither across nor within subjects. Meisel (p. 264) concluded that '... the emergence of subjects in the speech of L2 learners is a phenomenon totally independent of the development of agreement markings on the verb'.

Evidence from English L1 acquisition indicates that there is an initial stage at which subjects are optional and inflection is omitted (Valian, 1991). With the acquisition of present and past-tense inflections, subjects become obligatory (Brown, 1973; Bloom et al., 1975). Hilles (1991) investigated the developmental relationship between verbal inflection and the use of pronominal subjects in three groups

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5 Meisel did not distinguish between preverbal and postverbal null subjects in the way this has been done in recent L1 acquisition studies (Hamann, 1992; Duffield, 1993).
of Spanish-speaking L2 learners of English: two children (age: 4 and 5 years), two adolescents (age: 10 and 12 years) and two adults (age: 25 and 33 years). She found statistically significant correlations between the use of inflectional suffixes (tense and/or agreement markings) and the increase of overt pronominal subjects, but only for the two children and one adolescent; for one of the adolescents and the two adult learners, there was no indication of improvement with respect to either phenomenon, and therefore no evidence of any developmental correlation between verbal inflection and the use of overt pronominal subjects.

Lakshmanan (1991) investigated null subjects and subject-verb agreement in the longitudinal corpora of three (naturalistic) child L2 learners of English with different L1 backgrounds (Spanish, French, Japanese); the children's ages ranged between 4:6 and 5:4 at the beginning of the study. The percentages of null subjects and subject-verb agreement markings Lakshmanan calculated for these data indicate improvements in the development of overt subjects which were not accompanied by corresponding developments in the agreement system. Lakshmanan (1991: 407) concluded that her data from child L2 learners do not provide any evidence that their increase of overt subjects results from a resetting of a UG parameter. This is in contrast to what Hilles (1991) found for three of her subjects. Notice, however, that as Hilles' study only included native speakers of one language (Spanish) it is not clear what role L1 transfer plays in these learners' acquisition of English. For example, Spanish and English are similar in that Φ-features exist in both languages. In other words, the presence of a subject-verb-agreement paradigm in the L1 may have some influence on these learners’ acquisition of English. Thus, as pointed out by Lakshmanan (1991: 390), it is not evident from Hilles' study whether her learners access UG parameter values directly, or through the mediation of their L1.

The three studies mentioned above were not able to demonstrate developmental clusterings between null subjects and subject-verb agreement in L2 acquisition which could be interpreted as parameter-resetting effects. Against this background, Vainikka and Young-Scholten (1994) claimed to have shown such developmental clustering effects in the acquisition of German by Turkish and Korean adult learners, parallel to those found for German L1 acquisition. Vainikka and Young-Scholten concluded that the null-subject parameter is only set in connection with the acquisition of the subject-verb-agreement paradigm, both in child L1 and in adult L2 acquisition. Their data consist of a cross-sectional sample of spontaneous speech from 11 Turkish and 6 Korean adults learning German, and most of the samples come from the LexLern project at the
University of Düsseldorf (cf. Clahsen et al., 1990). Vainikka and Young-Scholten used the method of implicational scaling (cf. Meisel et al., 1981) to hypothesize three developmental stages in their data:

1) **Stage I (2 Turks, 1 Korean):** No subject-verb agreement; subjects optional.
2) **Stage II (6 Turks, 2 Koreans):** No subject-verb agreement; subjects more often overtly realized (around 70%, cf. their Table E).
3) **Stage III (3 Turks, 3 Koreans):** Subject-verb-agreement paradigm acquired; subjects obligatory (over 80% of obligatory subjects overtly realized).

According to this sequence, it appears as if the agreement paradigm is mastered at the same stage at which the null-subject parameter is correctly fixed, namely at stage III. This, they claim, is parallel to what has been found for German child language, indicating that UG parameters are operative in adult L2 learners. As the sequence from stage I to III seems to hold not only for Turkish learners but also for Koreans, Vainikka and Young-Scholten argue that L2 learners may reset UG parameters to values not found in their first language.\(^6\)

As the data from the Korean L2 learners are taken as the crucial evidence in favour of the strong UG hypothesis, let us inspect these data more closely. First, the tables in the appendix to Vainikka and Young-Scholten’s article indicate that the three Korean learners in Vainikka and Young-Scholten’s group III have in fact acquired the subject-verb-agreement paradigm, and they do not tend to omit subjects. This observation tells us that these three Koreans are relatively advanced learners of German who seem to pattern like native speakers with respect to agreement and null subjects, but in contrast to Vainikka and Young-Scholten’s claims, the existence of this group of advanced Korean learners does not tell us that the two properties ‘agreement’ and ‘null subjects’ have been acquired at the same point in development. The three Korean learners might have acquired the subject-verb-agreement paradigm and the correct use of overt subjects at different points in development, and these intermediate stages are perhaps not represented in Vainikka and Young-Scholten’s cross-sectional data. If this were the case, then their

\(^6\) Recall that Korean and German are rather different with respect to null subjects and subject-verb agreement: neither Φ-features nor Agr exist in Korean. Thus, in the case of the Koreans’ acquisition of these properties of German, transfer effects can be excluded. This does not hold for the Turkish learners, however, as Turkish – similar to German – exhibits a subject-verb-agreement paradigm.
analysis in terms of parameter resetting could of course not be maintained.

Secondly, the less advanced Korean learners in their groups I and II have not acquired the agreement paradigm. These learners are (following Vainikka and Young-Scholten) not able correctly to set the null-subject parameter, and should therefore not have obligatory subjects. Table E (Vainikka and Young-Scholten, 1994: 302) demonstrates that this is in fact incorrect for two of the three Korean learners in their groups I and II, namely for Changsu and Dosik: of all the 17 learners, Changsu and Dosik achieve the highest scores for overtly realized subjects, 92% and 90% respectively, but neither Changsu nor Dosik has acquired the agreement paradigm (cf. Vainikka and Young-Scholten, 1994: Table 3, p. 294). Thus it seems as if the native-like performance on the use of subjects does not coincide with the acquisition of Agr in these learners.\(^7\)

Vainikka and Young-Scholten's (1994) findings are less conclusive than they would have us believe. We will therefore further investigate the strong UG hypothesis and test the developmental relationship between agreement and null subjects experimentally.

V Sentence-matching experiments

We administered a reaction-time (RT) experiment to investigate the developmental relationship between properties of null subjects and subject-verb agreement in L2 acquisition. In RT experiments, subjects react to a stimulus in a choice reaction context, and the time it takes subjects to react to a stimulus is measured. We adopted the model for the specific RT instrument used in our experiments from Freedman and Forster (1985) and earlier work by Chambers and Forster (1975). These authors studied adults on their native language, i.e., on English.

\(^7\) Vainikka and Young-Scholten (1994: 293) are aware of these discrepancies, and in order to explain them, they propose an additional requirement according to which Spec-positions must be overtly filled. Consider the data from Dosik. Vainikka and Young-Scholten (Table D, p. 300) provide independent evidence from verb raising for positing a functional projection (termed FP) above VP for Dosik. The frequent use of overt subjects is interpreted as an indirect effect of the filled-Spec requirement according to which the Spec-FP position must be lexically filled either with the subject or with some other XP. If this analysis were correct, one would expect to find (1) that the Spec-FP position, i.e., the position preceding the finite verb is always filled, and (2) that subjects as well as other XPs appear in this position. The data show that (1) holds, but that (2) is unclear. Dosik produces 50 and Changsu 12 sentences with raised verbs, and in all of these 62 sentences the position preceding the finite verb is overtly filled, thus confirming prediction (1). In more than 90% of these cases, however, it is the subject that precedes the finite verb, and there were only five cases of nonsubject XPs in this position. This distribution indicates that the position preceding the finite verb is directly rather than indirectly related to overt subjects.
The same/different matching task: In this task, Forster and his colleagues presented subjects with two stimuli (e.g., two words or two sentences) from a computer screen and then asked them to decide as quickly and accurately as possible whether these two stimuli are the same, or whether they are different. Chambers and Forster (1975) found that subjects responded more quickly to word pairs such as HOUSE/HOUSE than to nonwords such as HSEOU/HSEOU, even though the nonword stimuli were of the same length as the word pairs. They argued that an existing word could be encoded as a single element, whereas the nonword could only be encoded as a string of individual letters and that this slows down the response times on an RT task. Chambers and Forster conclude that in the same/different matching task the smaller the number of units or chunks, the quicker the processing, and thus the shorter the response time.

Forster (1979) and Freedman and Forster (1985) extended this technique to a sentence-processing task. They asked subjects to decide whether two sentences are the same or different. They tested grammatical sentences, as in (6), and ungrammatical pairs of strings, as in (7):

6) DOGS GROWL
   DOGS GROWL
7) GROWL DOGS
   GROWL DOGS

Note that this is not a grammaticality judgement task. The subject does not have to decide whether the sentence pair is grammatical or ungrammatical, but the subjects are required to make a same/different matching decision for both grammatical and ungrammatical sentence pairs. In their sentence-matching experiments with native speakers, Forster and his colleagues found effects similar to those observed for word/nonword matching: grammatical sentences such as (6) required significantly shorter RTs than ungrammatical strings such as (7). Grammatical sentences form a single unit (= CP or IP), whereas ungrammatical sentences cannot be represented as headed by a single syntactic node and thus require longer matching times, all other factors being equal. The idea behind this experiment is that the presence of structure (i.e., word structure or sentential structure) in the stimuli facilitates the same/different decision. In general, a subject's RT to a particular sentence pair can be taken to be a function of its grammaticality: grammatical sentences can be matched faster than ungrammatical ones. Therefore, performance in SM tasks provides a way of determining the availability of structural representations.
For some grammatical phenomena, however, the SM task does not produce ungrammaticality effects in native speakers, e.g., for subjacency violations in wh-questions (cf. Freedman and Forster, 1985; Crain and Fodor, 1987), and for sentences violating the verb-second constraint of German (Eubank, 1993; Clahsen et al., 1995). There is a controversy in the psycholinguistic literature as to how these missing ungrammaticality effects should be explained. This debate need not concern us here (cf. Clahsen et al., 1995, for some discussion). What we need to show, however, before we can use the SM task for L2 learners, is that the particular phenomenon under study produces a significant ungrammaticality effect in native speakers. If this is the case we may infer that, for the particular phenomenon under study, SM latencies provide a measure for the availability of the corresponding structural representations.

Sentence-matching experiments on L2 acquisition: Bley-Vroman and Masterson (1989), Eubank (1993) and Masterson (1993) were the first to apply the SM technique to study L2 acquisition. Their idea was that if the SM task provides a measure of the availability of structural representations in native speakers, then the SM task could also be used for measuring grammaticality/ungrammaticality in L2 learners. Suppose, for example, we compare sentences with correct and incorrect agreement in the SM task and, for native speakers, we would get a significant ungrammaticality effect for agreement violations (cf. Freedman and Forster, 1985). In early L2 learners, however, we might find no RT difference between these sentences. This would indicate that subject-verb agreement has not yet been acquired as the presence of correct agreement does not facilitate the experimental task. Eubank (1993) and Bley-Vroman and Masterson (1989)8 point out that applied in this way the SM task provides a very useful experimental technique in L2 acquisition research.

The goal of our RT experiments is to discover whether developmental clusterings exist between subject-verb agreement and the null-subject property in the L2 acquisition process of German by Korean learners. In order to achieve this goal, we must first examine

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8 Masterson (1993) and Bley-Vroman and Masterson (1989) suggest the SM task as a supplement to grammaticality judgement tasks. They argue that grammaticality judgement tasks are not valid for studying L2 competence and that the SM task might also have certain flaws. If, however, the results from these two techniques converge, then they feel they can have confidence in the validity of both methodologies. This point seems to us slightly circular, because a technique that has shown or is assumed to be invalid, namely grammaticality judgement tasks, should not be used to validate a technique whose validity we wish to assess. For this reason, we have not compared our SM findings with results from grammaticality judgement tasks.
whether in native speakers of German, agreement violations and incorrect null subjects yield significantly longer RTs in the sentence-matching task than the corresponding grammatical sentences. Provided that these two phenomena produce ungrammaticality effects in native speakers, we can start using the SM task to study L2 learners.

The main prediction for our SM experiments with Korean L2 learners is that if adult L2 acquisition is not fundamentally different from child L1 development and is guided by UG parameters, then we would expect to find that those learners who pattern like native speakers in the agreement condition also pattern like natives in the null-subject condition and that those L2 learners who differ from native speakers in the agreement condition also differ from native speakers in the null-subject condition. This would support the view that parameter resetting is at work in adult L2 acquisition. We will examine the SM tasks for native speakers and adult L2 learners separately. Before turning to the results let us briefly describe the experimental procedure and the subjects who were included in the experiments.

1 Procedure

The task of the subjects was to judge as rapidly and precisely as possible whether two sentences which appeared on a PC screen were identical or not. After subjects gave the start signal by pressing any key on the keyboard, the first sentence appeared on top of the screen followed, after a short delay, by the second sentence, which was presented indented at the bottom of the screen. Both sentences remained on the screen for a short period and then disappeared. Subjects responded by pressing a colour-marked key on the keyboard: a blue button for 'matching' items or a red one for 'non-matching' items. Subjects' RTs were measured from the moment the second sentence appeared on the screen up to the subjects' response reaction. The presentation of items as well as the recording of response latencies were controlled by a computer program (cf. Eubank and Bley-Vroman, 1989). After each trial some feedback was provided as to whether the response had been correct or not. The subjects started the next test item by pressing an arbitrary key. Another feature of the computerized presentation is that a warning appeared on the screen if the subject did not respond within the given time or if an invalid button was pressed. Before the experiment began, subjects were provided with a detailed oral introduction which was accompanied by a short practice to familiarize subjects with their task. The experiments were carried out at the
University of Düsseldorf, where 10 SIEMENS personal computers were available. Subjects were tested in several groups on separate days.

As proposed in Freedman and Forster (1985), only those matching items for which a correct response had been obtained were included in the data analysis. Test items leading to wrong or invalid responses were not included in the analysis because other non-controlled factors might have been involved, which prohibit any direct comparison to the RTs of correct responses. Furthermore, the effects of occasional trials with extremely long or short response latencies were minimized by establishing cutoff points two SD units above or below the mean response time for each subject. Values above or below these cutoff points were set equal to the appropriate cutoff value; this procedure, too, was adopted from Freedman and Forster (1985). In order to determine significant differences, separate ANOVAs were calculated for subjects and items, with the resulting $F$ values being combined to form min $F$ (cf. Clark, 1973).

2 Materials

The main items of the experiment were grammatical and ungrammatical German sentences containing violations of subject-verb agreement and the null-subject property. The overall ratio of grammatical and ungrammatical items was set at 1:1. The experimental items are presented in Appendix I.

a Agreement: Three grammatical sentences were constructed for each possible combination of three grammatical persons in singular or plural, resulting in 18 items altogether. To minimize the effect of lexical idiosyncracy, only regular high-frequency verbs of German were used (cf. Ruoff, 1981). In addition to that, the length of the sentences was controlled with respect to number of words and number of syllables: for each sentence, the number of words was either 6 or 7, and the number of syllables 10 or 11. Ungrammatical sentences differed from their grammatical counterparts only in their verbal suffixes, as illustrated by the following sentence pair:

8a. Du fliegt nach Korea am nächsten Sonntag
     you fly-2nd sg. to Korea next Sunday

8b. *Du fliegt nach Korea am nächsten Sonntag
     you fly-3rd sg. to Korea on the next Sunday

9 All 'correct matches' for each subject went into the calculations on the RTs, and there was no minimum number of matches needed in order to qualify for inclusion in the RT comparisons.
b Null subjects: Recall that embedded sentences with empty referential subjects are ungrammatical in German, because (following Rizzi, 1986) German Infl/Agr is [-pronominal] and cannot identify an empty argument via head binding. If SM is sensitive to this kind of violation, embedded sentences with null subjects should take longer to match than grammatical control sentences.

24 embedded sentences were constructed, 12 with and 12 without overt referential subjects. In the grammatical sentences, the subjects of the matrix clause were either proper names or common nouns, while in the embedded sentences the subjects were personal pronouns (cf. 9a). In the ungrammatical items, the pronominal subjects of the grammatical sentences were replaced by adverbs which contained the same number of syllables as the pronouns (cf. 9b). Each embedded sentence was introduced by the complementizer daß ('that'), which is most commonly used in German. The test items contained 7 words and 8 or 9 syllables each. To exclude the potential influence of different verbal suffixes on RTs, only 3 ps. sg. subjects were used, in both embedded and matrix clauses:

9) a. Der Lehrer sagt daß er Musik hört
   the teacher says that he music hear-s

b. *Der Lehrer sagt daß oft Musik hört
   the teacher says that often music hear-s

c Filler items: Two kinds of filler items were used to make sure that the subjects were in fact performing the task accurately: 1) nonmatching pairs in which one word of the second sentence was replaced with a different one of the same length (cf. 10); and 2) pairs of meaningless word strings consisting of 6/7 constituents (cf. 11). These filler items were not included in the data analysis:

10) Du schwimmst jeden Morgen in der Schwimmhalle
    you swim every morning/evening in the swimming pool'

11) Zu Blume die kochen Auto deutsch
    'to flower the cook car German'

The overall ratio between matching and nonmatching pairs was set at 3:1,\(^\text{10}\) i.e., in the agreement condition, 11 filler items were used,

\(^{10}\) In other studies using the matching paradigm, the ratio between matching and nonmatching items was set either at 1:1 or at 3:1. We have chosen the latter because of the high number of test items included in our experiments. In general, there seems to be no compelling reason to take any particular ratio between matching and nonmatching items; cf. Bley-Vroman and Masterson (1989: 231) for discussion.
and in the null-subject condition 18. The structure of the filler items was quite different from that of the experimental items; they were used to prevent subjects from attempting to develop special strategies for the experimental items (cf. Freedman and Forster, 1985). Table 1 presents a summary showing the total number of the various types of items used in our experiments.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Items used in the SM experiments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experiment 1 (agreement)</td>
</tr>
<tr>
<td>Matching sentences</td>
<td>51</td>
</tr>
<tr>
<td>Grammatical</td>
<td>18</td>
</tr>
<tr>
<td>Ungrammatical</td>
<td>18</td>
</tr>
<tr>
<td>Meaningless word strings</td>
<td>15</td>
</tr>
<tr>
<td>Nonmatching sentences</td>
<td>17</td>
</tr>
<tr>
<td>Grammatical</td>
<td>6</td>
</tr>
<tr>
<td>Ungrammatical</td>
<td>6</td>
</tr>
<tr>
<td>Meaningless word strings</td>
<td>5</td>
</tr>
</tbody>
</table>

3 Results

a Experiment 1: Twenty native speakers of German (14 females and 6 males) were tested in the first experiment. All were students of the University of Düsseldorf, their ages ranging from 19 to 28. The purpose of our first experiment was to replicate the ungrammaticality effects that have been found in SM experiments on English in another language, namely German. The results of this experiment are reported in detail in Claßen et al. (1995). Here we present a brief summary (Table 2).

The mean correct 'same' response time for ungrammatical items involving agreement errors was 279 msec longer than for the corresponding grammatical items. The ANOVA results indicate that this difference is significant. In fact, 19 out of 20 subjects had shorter mean RTs to grammatical items than to ungrammatical ones (see Appendix IIA). These figures replicate findings on English SM studies. The figures for null subjects are parallel to those on subject-verb agreement: the mean correct RTs for items such as (9a) and (9b) produced a significant ungrammaticality effect of 269 msec,

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Native speakers' mean RTs for subject-verb agreement and null subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grammatical</td>
</tr>
<tr>
<td>Agreement</td>
<td>1674</td>
</tr>
<tr>
<td>Null subjects</td>
<td>1872</td>
</tr>
</tbody>
</table>
and 19 out of 20 subjects had shorter mean RTs to grammatical items than to ungrammatical ones (see Appendix II A).\textsuperscript{11} These results indicate that SM is sensitive to ungrammaticality resulting from illegal empty subjects and agreement errors.

\textit{b} Experiment 2: 33 adult Korean learners of German were tested in experiment 2. All were students studying at the University of Düsseldorf: 17 males, 16 females, with ages ranging from 22 to 35 (mean age: 27.5). Some had attended and some were still attending German language courses (between 1 month and 2.5 years) and the duration of residence in Germany ranged from 1 month to 16 years. In order to familiarize the subjects with the lexical items used in the experiment they were provided with a word list of all the items used in the experiment, at least 24 hours before the actual experiment was carried out. Subjects were required to check the word list and to familiarize themselves with unknown words. The time intervals set for the native speakers of German used in experiment 1 were readjusted appropriately, each multiplied by 1.5. This was based on a pretest with one native speaker of Korean. In general, no subject had any difficulty with the time intervals provided.

In order to make sure that the Korean subjects were capable of dealing with embedded clauses such as those used in the experiment, we included a pretest in which each subject was required to translate three embedded sentences headed by the complementizer \textit{daβ} from German into Korean. All of our 33 subjects passed this pretest.

The main goal of experiment 2 was to examine potential developmental correlations between agreement and null subjects in the L2 acquisition of German. To investigate this, we must first determine which of the 33 Korean subjects from our study acquired both agreement and the correct properties of lexical/null subjects in German, which learners acquired just one of these grammatical properties and which acquired neither of them. For this purpose we will rely on the results of the SM experiment. Recall from our first

\textsuperscript{11}\textsuperscript{11} Lynn Eubank (pers. comm.) has suggested that an underlying \textit{pro} subject must be generated to fill the empty subject position in the embedded clause of (9b) and that therefore the syntactic representation of (9b) contains one element more than the corresponding sentence (9a), thus yielding the observed RT increase. This reasoning might probably hold for Italian-type languages in which sentences with \textit{pro} and with overt subjects are grammatical. In such languages, 'number of words' cannot be used as a matching criterion, since (syntactically speaking) a \textit{pro} is as real as any other NP. The grammar of German, however, does not generate \textit{pro} in sentences such as (9b). There is, therefore, no reason to believe that the native speakers of German studied in our experiment filled the subject positions of sentences such as (9b) with \textit{pro}. We maintain that the RT increase in sentences such as (9b) is not a length effect, but results from their ungrammaticality.
experiment that correct subject-verb agreement and correct overt subjects lead to a facilitating effect in the SM task: sentences without agreement or null-subject errors yielded significantly shorter RTs than corresponding ungrammatical sentences; this holds for all but one of the native speakers. We expect the same facilitating effect for those L2 learners who acquired agreement and the correct properties of null subjects in German. On the other hand, those L2 learners who have not yet acquired these two properties of German should not produce significant SM differences between grammatical and ungrammatical sentences. The results are as follows:

1) **Agreement:** 18 out of 33 Korean learners pattern like native speakers of German in the SM task and produced significantly shorter SM latencies in the grammatical items (see Table 3).

2) **Null subjects:** 26 out of 33 Korean learners pattern like native speakers with significantly shorter SM latencies in the grammatical items (see Table 4).

**Table 3**

<table>
<thead>
<tr>
<th></th>
<th>Grammatical</th>
<th>Ungrammatical (+392)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement</td>
<td>3547</td>
<td>3939</td>
<td>min $F(1,32) = 13.05, p &lt; .01$</td>
</tr>
</tbody>
</table>

**Table 4**

<table>
<thead>
<tr>
<th></th>
<th>Grammatical</th>
<th>Ungrammatical (+305)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null subjects</td>
<td>3005</td>
<td>3310</td>
<td>min $F(1,21) = 16.17, p &lt; .01$</td>
</tr>
</tbody>
</table>

As a preliminary result we conclude that 18 out of 33 Korean learners acquired the correct subject-verb-agreement paradigm of German and that 26 out of 33 learners acquired the correct properties of null subjects in German (see Appendix IIB for individual subject scores).

In order to examine clustering effects between agreement and properties of null subjects, two questions were examined: 1) Do those 18 Korean learners who produced significant effects in the agreement condition also have significantly shorter SM latencies in the grammatical sentences without null subjects? 2) Do those 26 Korean learners who pattern like native speakers in the null-subject condition also produce significantly shorter SM latencies in sentences without agreement errors? The results are summarized in Tables 5, 6 and 7.

Table 5 shows that the four logically possible combinations are represented in our data: 13 learners have acquired subject-verb agreement as well as correct overt subjects, two learners have not
Table 5  Korean learners’ acquisition of agreement and lexical subjects

<table>
<thead>
<tr>
<th>Null-subject condition: not acquired</th>
<th>Agr not acquired</th>
<th>Agr acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

acquired any of the two phenomena and 18 learners have acquired just one of the two properties, five ‘agreement’ and 13 ‘overt subjects’.

The data from those 13 learners who patterned like native speakers in both conditions are ambiguous. Proponents of the strong UG hypothesis might speculate that these learners have acquired subject-verb agreement and correct overt subjects at the same time, and they might take this to indicate that these learners have set the null-subject parameter at the correct value for German. Alternatively, however, one might argue that both phenomena have been acquired separately from one another, not involving any kind of parameter setting. Hence, the data available from these 13 learners are compatible with both the strong and the weak UG hypothesis. The same holds for those two learners who have not acquired any of the two phenomena indicating that they seem to be at a lower stage of L2 development than the other learners.

More interesting with respect to the theoretical issues under debate are those learners who have only acquired one of the two properties. Table 5 shows that out of the 26 Korean learners who patterned like native speakers in the null-subject condition, only 13 learners produced significant ungrammaticality effects in the agreement condition. A $\chi^2$-test, based on the figures in Table 5, shows that there is no significant connection between these two variables in the Korean learners ($\chi^2 = .34$, $p = .56$, ns). This provides evidence for the claim that subject-verb agreement and the correct properties of null subjects are developmentally dissociated in L2 acquisition.\(^{12}\)

A second statistical test made use of ANOVA for the RT figures in Tables 6 and 7. Table 6 presents RTs for null-subject sentences from those Korean learners who have acquired subject-verb agreement, and Table 7 presents RTs for subject-verb agreement from those Korean learners who patterned like native speakers in the null-subject condition.

Table 6  Korean Agr acquirers’ mean RTs for null subjects ($n = 18$)

<table>
<thead>
<tr>
<th>Grammatical</th>
<th>Ungrammatical</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null subjects</td>
<td>3161</td>
<td>3381(+220)</td>
</tr>
</tbody>
</table>

\(^{12}\) Notice incidentally that many more of the learners had acquired the correct properties of null subjects without having acquired agreement (=13) than had acquired agreement without having the correct properties of null subjects in German (=5). This suggests that the distribution of null subjects is easier to learn in L2 development than subject-verb agreement.
The figures in Table 6 and 7 show that although the mean RTs for ungrammatical items are longer than for grammatical items, these differences are clearly not significant. Thus we can be sure that for these Korean learners there is no connection between subject-verb agreement and the acquisition of the correct properties of null subjects in German.

Finally, the SM latencies in the ‘agreement’ condition (Table 7) are longer than those of the null-subject condition in Table 6; this holds for grammatical and ungrammatical items. In addition, there is a difference in the general trend when comparing the native speakers and the L2 learners in terms of absolute SM latencies: for the natives, the RTs for ‘agreement’ prompts were shorter than those for ‘subject’ prompts (Table 2), whereas for the L2 learners it is the opposite (Tables 3 and 4). This holds for both grammatical and ungrammatical items. The significance of these observations is not clear, however. The SM technique does not claim to provide a direct measure of grammatical complexity or the like, and no predictions are made for absolute SM latencies in different syntactic constructions.

VI Discussion

In contrast to what was found for child German, our experiment with the Korean L2 learners shows that in these learners there is no clustering effect between subject-verb agreement and the correct properties of null subjects in German. This was demonstrated for 18 learners who had acquired one of the two phenomena. The remaining 15 learners had either acquired both or neither of the two phenomena. Since the experiment is based on cross-sectional data, we do not know whether these learners acquire the two phenomena at the same time, or whether they learn subject-verb agreement and the correct properties of null subjects separately from one another. Whereas the data from these 15 learners are compatible with both the strong and the weak hypothesis, the data from the other 18 learners are incompatible with the strong version of UG hypothesis. We suggest that the differences between L1 and L2 learners can best be explained in terms of the weak UG hypothesis according to which UG parameters are fully accessible to child L1 but not to adult L2 learners. Most probably, however, proponents of the
strong UG view will not be convinced by this finding. Instead, they might point out shortcomings of our study and suggest alternative explanations. Let us anticipate and discuss some potential counterarguments.

First, one might argue that the acquisition of the two phenomena ‘agreement’ and ‘null subjects’ do in fact covary in L2 learners, but that the SM task simply fails to demonstrate this correlation. The general argument is that from being unable to find a connection in one specific experiment, one cannot conclude that there is no connection. This is of course a valid point, but notice that the results of other L2 acquisition studies (summarized earlier) are consistent with our findings, although they were based on entirely different kinds of data. These parallels minimize the danger that our experimental findings are just task-specific artifacts.

Secondly, one might object that the L2 subjects in our study are at a relatively advanced level of development when the experiment was conducted, and that they may have gone through an earlier stage at which ‘agreement’ and ‘null subjects’ have indeed been linked. Hence, if ‘agreement’ and ‘null subjects’ were connected at the point of acquisition, but not at the time we conducted the experiment, the 18 learners who have acquired either agreement or null subjects must have lost one of these properties later in development. This possibility cannot be excluded, but it seems to be totally ad hoc, and additional considerations would be required to explain why, how and when these 18 learners should have lost one of the two properties. Moreover, the evidence available from longitudinal studies (see above) does not support the idea that the L2 learners’ acquisition of agreement is developmentally connected with the correct use of overt subjects.

Thirdly, the observation that in L1 acquisition the setting of the null-subject parameter(s) is crucially tied to the acquisition of the subject-verb-agreement paradigm does not necessarily entail that this is the only way to set the parameter(s). Since there is nothing that forces the relation to be a biconditional one, L2 learners might have full access to UG parameters, but simply use different triggers from those used by children to set the parameter(s). Thus, the observation that subject-verb agreement and the correct use of overt subjects do not seem to be connected in L2 acquisition does not prove the inaccessibility of UG parameters. Consider, for example, the 13 Korean learners who pattern like native speakers on null subjects in our experiment, but not on agreement. One might speculate that these 13 learners have set the null-subject parameter at the correct value for German without having acquired subject-verb agreement. These L2 learners are certainly exposed to German
input in which pronouns occur in environments which would be excluded in Korean, and perhaps these data provided the trigger for correctly setting the null-subject parameter.

The trouble with this account is that exposure to subject pronouns is not a reliable trigger for setting the null-subject parameter at the correct value for German. In the input, learners are confronted with conflicting data; some sentences have overt subjects, and some sentences have null subjects. Hence, it is unclear how the learners should set the null-subject parameter just from observing that German allows overt subjects in certain environments. The second problem with the idea that, in the acquisition of German, the null-subject parameter is correctly set without having subject-verb agreement is that we must not apply it to L1 acquisition as it makes the wrong predictions. We would expect to find children whose usage of overt subjects is adult-like, but who have not acquired subject-verb agreement. Such cases, however, have not been documented in L1 acquisition studies of German. Thus the observed differences between L1 and L2 learners cannot be explained under this account. Despite these problems, we cannot completely rule out the possibility that, for reasons presently unknown,\(^{13}\) Korean L2 learners rely on different triggers from those used by German children when they acquire correct overt subjects of German. However, what we can reject on the basis of our results are Vainikka and Young-Scholten’s (1994) claims concerning the clustering of agreement and null subjects in L2 learners. Whereas the acquisition of subject-verb agreement is the precursor to parameter setting in first language development, the correct use of overt subjects in L2 learners is – contra Vainikka and Young-Scholten – not tied to their acquisition of the agreement paradigm.

Fourthly, one might speculate that the theoretical notions we have adopted from syntactic theory, specifically Rizzi’s theory of pro, are flawed, and that the linguistic phenomena we have studied follow from other parameters or that they do not even involve UG parameters of any kind. This could mean that UG parameters do not guide the acquisition process, neither of L1 nor of L2 learners, and then there is of course room for other ways to approach the data. However, any alternative account should be able to explain why agreement and null subjects cluster together in child L1 acquisition, whereas in L2 learners they seem to be independent.

Finally, one might argue that we have not chosen the right control group for our SM studies on L2 acquisition. Specifically, as sug-

\(^{13}\) L1 transfer might be relevant in this regard, but note that in our study of Korean learners of German transfer effects can be excluded.
gested by one *Second Language Research* reviewer, German children, when they acquire subject-verb agreement and the correct properties of null subjects, might respond in the SM task in the same manner as the Korean L2 learners. If this were the case we could not maintain our claim that L1 and L2 learners differ with respect to accessing UG parameters.

The problem with this proposal is that it is not testable. German children acquire the subject-verb-agreement paradigm and the correct use of overt subjects between the age of approximately 2:0 and 2:5, and it is simply impossible to conduct an SM task with 2-year olds. Instead, we have made use of several control groups. The SM results from the L2 learners were compared with SM findings on native speakers of German, yielding clear differences. Secondly, we have reanalysed Vainikka and Young-Scholten’s (1994) findings from spontaneous speech samples of Korean learners (see above), and these data can also be thought of as a control. Like the SM results, these data demonstrate that the acquisition of agreement and the correct use of overt subjects are developmentally dissociated in Korean L2 learners. Thirdly, we compared findings on Korean L2 learners with corresponding results from child L1 acquisition studies, yielding clear differences. These different kinds of comparisons and the empirical evidence we currently have lead us to conclude that the findings can best be explained in terms of the weak UG hypothesis.

**VII Conclusion**

We conducted an RT experiment with adult Korean learners of German in which we found that those learners who pattern like native speakers in the agreement condition do not produce a parallel effect in the null-subject condition and vice versa indicating that the two phenomena we have investigated are independent in L2 acquisition. Our results are parallel to those of other L2 acquisition studies, summarized above. Vainikka and Young-Scholten’s (1994) strong UG hypothesis, however, was not confirmed: the L2 acquisition data cannot be analysed in terms of setting or resetting of UG parameters; rather, agreement and the null-subject property seem to be separate acquisitional tasks for L2 learners. We have discussed various attempts to make these findings compatible with the strong UG hypothesis, none of which appear to be convincing to us. We conclude that our results support the weak UG view according to which processes such as parameter setting are not at work in L2 development.
References


Agreement and null subjects in German L2 development


Appendix I

A Subject-verb agreement

In the ungrammatical items, the verb (italicized) was replaced with the element in parentheses:

1) Ich besuche heute abend ein Mädchen (besucht)
   ‘I see tonight a girl’ (see-3rd sg.)

2) Du wartest sehr lange in dem Warterraum (warte)
   ‘You-2nd sg. wait very long in the waiting room’ (wait-3rd sg.)

3) Er lebt in München mit einem Ausländer (lebst)
   ‘He lives in Munich with a foreigner’ (live-2nd sg.)
4) Wir gehen nach Hause mit dem Professor (geht)  
‘We go home with the professor (go-3rd sg.)
5) Peter und Inge wohnen in Düsseldorf (wohnt)  
‘Peter and Inge live in D’ (live-3rd sg.)
6) Ihr macht einen Spaziergang im Volksgarten (machst)  
‘You-pl. have a walk in the Volksgarten’ (have-2nd sg. a walk)
7) Du fliegst nach Korea am nächsten Sonntag (fliegen)  
‘You-2nd sg. fly to Korea next sunday’ (fly-3rd pl.)
8) Er braucht das Auto heute nachmittag (brauchen)  
‘He needs the car this afternoon’ (need-3rd pl.)
9) Ich arbeite morgen in der Bibliothek (arbeiten)  
‘I work tomorrow in the library’ (work-3rd pl.)
10) Ihr kauft eine Lampe auf dem Flohmarkt (kaufen)  
‘You-2nd pl. buy a lamp at the flea-market’ (buy-3rd pl.)
11) Wir spielen Tennis in der Sporthalle (spiele)  
‘We play tennis in the sports hall’ (play-1st sg.)
12) Ich schreibe dem Professor einen Brief (schreiben)  
‘I write the professor a letter’ (write-3rd pl.)
13) Du bezahlst fünfzig Mark für einen Tisch (bezahlen)  
‘You-2nd sg. pay fifty marks for a table’ (pay-3rd pl.)
14) Inge und Hans lernen fleißig Englisch (lernen)  
‘Inge and Hans learn diligently English (learn-1st sg.)
15) Ihr sucht das Auto in einem Parkhaus (suchst)  
‘You-pl. look for the car in a car park’ (look-2nd sg. for)
16) Maria und Peter kommen aus Heidelberg (kommen)  
‘Maria and Peter come from Heidelberg’ (come-1st sg. from)
17) Er findet eine Wohnung in Wuppertal (finden)  
‘He finds a flat in Wuppertal’ (find-3rd pl.)
18) Wir bestellen drei Bier in einer Kneipe (bestellt)  
‘We order three beers in a pub’ (order-2nd sg.)

B Null subjects
In the ungrammatical items, the subject pronoun of the embedded clause (italicized) was replaced with the element in parentheses:

1) Peter sagt, daß er zu Hause bleibt (nur)  
‘Peter says that he at home stays’ (only)
2) Inge sagt, daß sie einen Freund hat (nur)  
‘Inge says that she a friend has’ (only)
3) Hans sagt, daß er das Museum besucht (oft)  
‘Hans says that he the museum visits’ (often)
4) Der Mann sagt, daß er Kaffee trinkt (gern)  
‘The man says that he coffee drinks’ (gladly)
5) Peter sagt, daß er nach München fährt (jetzt)
Peter says that he to Munich drives' (now)
6) Maria sagt, daß sie die Zeitung liest (oft)
   'Maria says that she the paper reads' (often)
7) Der Arzt sagt, daß er Kopfschmerzen hat (oft)
   'The doctor says that he headache has' (often)
8) Hans sagt, daß er zur Mensa geht (jetzt)
   'Hans says that he to the students' union goes' (now)
9) Die Frau sagt, daß sie Tennis spielt (gern)
   'The woman says that she tennis plays' (with pleasure)
10) Maria sagt, daß sie ein Regal kauft (bald)
    'Maria says that she a shelf buys' (soon)
11) Inge sagt, daß sie einen Brief schreibt (jetzt)
    'Inge says that she a letter writes' (now)
12) Der Lehrer sagt, daß er Musik hört (oft)
    'The teacher says that he to music listens' (often)

Appendix II
The following tables present individual subject scores from our SM experiments, Appendix IIA for German native speakers (n = 20) and Appendix IIB for Korean L2 learners (n = 33).
In the first column each subject is given a code number. The next three columns present RTs (in msec) for subject-verb agreement, column 2 for grammatical items, column 3 for ungrammatical ones and column 4 contains the RT differences between grammatical and ungrammatical items. The next three columns present RTs for null and overt subjects, column 5 for grammatical sentences (with overt subjects), column 6 for ungrammatical sentences (with null subjects), and the final column contains the RT differences between grammatical and ungrammatical items.

### Individual subject scores: German native speakers

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**B Individual subject scores: Korean L2 learners**

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