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Case and agreement in English language development*

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ABSTRACT

This study examines the relationship between third person singular (3Psg) subject pronoun case and agreement, focusing on the hypothesis that these two grammatical subsystems develop together. This hypothesis is broken down into two separate, empirically testable hypotheses: (a) that correct subject case pronoun production and the production of agreement are correlated, and (b) that at the sentence level, correct case is dependent on the presence of agreement. Twenty-nine children between the ages of 2;6 and 4;0 were each audiotaped for approximately two hours playing and interacting with their primary caregivers. Transcribed production data showed that 3Psg masculine subject pronoun case was correlated with agreement marking, whereas 3Psg feminine subject pronoun case was not. This result suggests the influence of a retrieval factor, termed the DOUBLE-CELL EFFECT, on the *her* for *she* pronoun case error. At the utterance level, pronoun case was independent of the presence of agreement. Overall, the study indicates that the relationship between case and agreement may be discernible as a general correlation, yet indiscernible at the level of sentence production.

INTRODUCTION

Case and subject-verb agreement are undoubtedly linked in adult grammars. Syntactic theories recognize that the case of a subject noun phrase (NP) or determiner phrase (DP) is dependent on the grammatical features associated

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with INFL, the head of the Inflectional Phrase (IP). (Haegeman, 1991). This dependency is illustrated in the pair of sentences 1(a) and (b).

(1) (a) He/she/they go/es to the store.
(b) Mother wanted him/her/them to go to the store.

In sentence 1(a), *go/es* is a finite verb, expressing both agreement and tense. The subject of this finite clause must be in the nominative case, that, *he/she/they*. In sentence 1(b), *to go* is non-finite, the verb *go* cannot agree or show tense, and the subject of the clause must be expressed by an objective case pronoun, *him/her/them*. In this paper we will use the term OBJECTIVE rather than ACCUSATIVE because when compared to more conservative Germanic languages, it is clear that English has conflated the accusative and dative cases into a single objective case.

Even more recent syntactic theory has sought to house the various grammatical features of finiteness, tense and agreement in their own syntactic phrases, each nested within one another, with layers for expression of tense, subject agreement, and objective agreement (Chomsky, 1995). However, the essential facts remain uncontroversial: nominative case is reserved for the subjects of finite clauses, positively featured for agreement (+AGR) and tense (−TNS).

Given the facts of the structure of adult English, one can readily understand why researchers in the area of syntactic development have been led to hypothesize that case assignment and INFL (Aldridge, 1989; Radford, 1990; Guilfoyle & Noonan, 1992; Vainikka, 1994), or, that case and finiteness (Wexler, 1994; Schutze & Wexler, 1996), are developmentally linked. In this paper, this general set of proposals will be grouped together and referred to as the CO-DEVELOPMENT hypothesis. The idea of co-development is that two elements of structure must develop together because they are reflections of a single, enabling, syntactic component. Radford (1990) is classic in this regard because functional categories simultaneously enable subject agreement, case, and tense, and therefore all should co-develop. The developmental relationship may go beyond contemporaneous emergence and may include simultaneous refinement and mastery. Aldridge states the hypothesis in the following manner: 'mastery of case assignment is inextricably linked to the acquisition of the 1-constituent' (1989). More recently, Schutze (1997) maintains that case and agreement co-develop because they are both aspects of syntactic-feature checking. As Schutze puts it, 'case and agreement come and go together'. Regardless of which of these accounts one follows, all accounts agree on the following point. Children's pronoun case errors should be incompatible with the presence of functional categories, finiteness, or agreement.

However, translating co-development into an empirically defined, statistically demonstrable relationship is a challenge. There have been two

attempts to do this in the literature. In the first, Loeb & Leonard (1991) attempted to verify Radford's hypothesis of the co-development of finiteness and case by determining whether subject–verb agreement and the rate of subject pronoun case error were correlated. In the second, Schutze & Wexler (1996) and Schutze (1997) attempted to test an empirical consequence of the OPTIONAL INFINITIVE HYPOTHESIS, namely that non-nominative subject pronouns were associated with root infinitive verbs at the utterance level.

Loeb & Leonard (1991) examined co-development among eight typically developing children and eight children with Specific Language Impairment (SLI). They reported that correct pronoun subject case (i.e. nominative as opposed to objective or genitive), and correct production of third person singular (3Psg) agreement markers (as opposed to their omission) were positively correlated. This significant correlation suggests a linkage at the level of the individual child. That is, a child who generally produces 3Psg agreement markers in obligatory contexts in general will be accurate with regard to the case of subject pronouns. Conversely, a child who is poor at producing 3Psg agreement markers in obligatory contexts is likely to be poor at producing correct nominative case subject pronouns. Unfortunately, Loeb & Leonard's correlation was not between two fully independent variables. When estimating the rate at which 3Psg markers were supplied in obligatory contexts, they included sentences with *he's* and *she's*, which could easily have been produced by rote. Inclusion of these rote forms would increase the apparent rate at which 3Psg markers are being produced, precisely for children who would also, apparently, have more accurate production of nominative 3Psg pronouns. To make these two variables truly independent, one would have to estimate the rate of 3Psg agreement marker production from sentences which did not have pronominal subjects. In addition, the correlation that Loeb & Leonard reports does not demonstrate that correct subject pronoun case is dependent on agreement. To demonstrate such a dependence, one must look, not at the overall performance of each child, but more deeply at the level of individual utterances.

Schutze (1997) claims to have demonstrated dependence. Schutze used chi square techniques to test whether or not non-nominative case (i.e. objective and genitive case) pronominal subjects were dependent upon the overt morphological marking of finiteness features. However, the demonstration suffered from one methodological flaw. The data used in the chi square tests were collapsed over long developmental time spans. As much as six months of data were collapsed into a single chi square analysis. In this fashion, sentences lacking agreement and exhibiting incorrect case for subject pronouns from early in the developmental span may have been grouped together with sentences exhibiting both agreement and correct case from later in the developmental span. As a result, the chi square tests may have only recapitulated the correlation found by Loeb & Leonard (1991), but not

actually have tested the hypothesis that case is dependent upon agreement at a particular moment in the development of an individual child's syntax. To demonstrate dependence of that sort, data must be confined to the same moment in developmental time.

In sum, researchers have sought to test the hypothesis of the co-development of case and agreement by tests of correlation and tests of association. However, methodology may have compromized the results of the empirical research reported to date. At this point, two methodological changes are needed for an effective demonstration of co-development: (a) correlation must be demonstrated between truly independent variables estimating accuracy at case assignment and agreement marking, and (b) dependence must be demonstrated in the sentential output of individual children at one particular point in developmental time.

Other factors have recently been brought to light concerning pronoun case errors that may also affect a possible demonstration of co-development. Specifically, the incidence of pronoun case errors is not entirely regulated by the state of the developing syntax. Large and significant differences have been observed in the rate of error across the pronouns. Focusing on the 3Psg pronouns, the error rate for the feminine pronoun is higher than that of the masculine pronoun, that is, *her* for *she* occurs at a significantly higher rate than *him* for *he* (Rispoli, 1994; Moore, 1995; Rispoli, in press). It has been proposed that the difference in error rate is the result of learning the word-specific paradigms for these pronouns (Rispoli, 1994; 1998a, 1998b). The feminine pronoun has a higher error rate because the word form *her* fills two cells of the 3Psg feminine (fem) paradigm (i.e. *she*, *her*, *her*). In contrast, the masculine (masc) pronoun has separate forms for each cell (i.e. *he*, *him*, *his*). This asymmetry can lead to a disproportionately large retrieval strength for *her*, making it difficult to inhibit *her* for *she* errors. The disproportionately large retrieval strength of *her*, and the resulting increase in the incidence of *her* for *she* errors has been termed the 'double-cell' effect by Rispoli (in press). Note that this proposal concerning the role of pronoun paradigm building is not an alternative to the hypothesis of co-development, but, rather, complements it. It might well be that paradigm building and lexical retrieval factors influence the production of pronominal case forms, and if this is so, these factors might cause variance in the correlation between 3Psg pronominal case and agreement marking, or the dependence of subject case on agreement. Given the power of the double-cell effect the relationships between case and agreement which are a reflection of co-development may well be nullified. Therefore, in a future test of co-development, it seems necessary to assess the relationship of agreement to each individual pronoun.

The purpose of this paper is to test the hypothesis that subject case assignment and agreement co-develop. The empiricial research reported in this paper is focused specifically on the subject pronoun case of the 3Psg masc

and 3Psg fem pronouns and its relationship to markers of 3Psg present tense (3Psg pres) (i.e. the regular verb suffix, -(*e*)*s*, irregular verb forms *is*, *does*, *has*, *says*, and the auxiliary form *is*). This empirical research attempts to replicate the findings of Loeb & Leonard (1991) and Schutze (1997), but also incorporates methodological innovations in order to avoid the problems noted in those previous studies. The research also takes into account possible differences between the 3Psg masc and 3Psg fem pronouns, which could potentially affect estimates of the relationship between subject case assignment and the morphosyntactic expression of agreement.

METHODS

Participants

The participants were 29 typically developing children between the ages of 2;6 to 4;0, with a mean age of 3;1. The participants were recruited from child-case centres in a large urban area in the western United States. The child participants were normally developing, with no major medical complications since birth. Prior to observation, the parents reported that the children demonstrated frequent use of multi-word utterances, produced occasional morphological overregularizations and pronoun case errors. It was also ascertained that the families of the child participants spoke Standard American English, to avoid the spurious influence of non-standard forms on the results. Participant families were paid $15 and an age appropriate book was also given for participation in the study. Speech samples obtained as part of this study (see Procedures) revealed that the children ranged in Mean Words per Utterance (MWU) from 2·0 to 4·4, with average MWU of approximately 3·0 (S.D. = 0·50). MWU was chosen as a gross measure of syntactic development to avoid the possibility of ascribing morphological productivity to forms that were produced by rote amalgam.

Procedures

The children and their primary caregivers were observed in two one-hour sessions, either at home or in a university playroom setting. The sessions were spaced no more than two weeks apart to minimize potential developmental change. The child–caregiver dyad was observed while engaged in three activities: (a) free play with human figure toys in a playground setting, (b) book-reading and (c) viewing family photographs. The purpose of these activities was to elicit talk using 3Psg pronouns. The sessions were audiotaped and context notes were taken by an observing researcher. Toys and books were selected so as to balance the number of male and female individuals represented.

Transcription and reliability

Within two weeks of the observation session, the audiotapes were transcribed into computer files, using the CHAT format, developed for the Child Language Database Exchange System (MacWhinney, 1995). All transcripts were then subjected to a consensus reliability pass, in which a second transcriber, who was not present at the original taping session, provided consensus reliability. The responsibility of the consensus transcriber was to confirm the presence of all transcribed words and bound morphology in the original transcript. If the consensus transcriber did not agree on a word in an utterance, the utterance was considered partially unintelligible and eliminated from the corpus. If the consensus transcriber did not confirm the presence of a bound morpheme or contraction, the affix or clitic was eliminated from the transcript. In essence, the original transcriber and the consensus transcriber had to agree on words and bound morphemes for those units to remain in the corpus of intelligible child utterances.

Independent transcript reliability was also performed on portions of the database to ensure relative accuracy on 3Psg masc and fem subject pronouns and bound morphology. Complete and intelligible child utterances in twelve randomly selected 15-minute segments were used in assessing reliability of pronoun transcription. When the original and independent transcripts had differing forms of a 3Psg masc & fem subject pronouns, it was considered a mismatch, with the following exception. When the original transcriber transcribed the genitive form *his* for the nominative form contracted with the verb *is*, *he*'*s*, the form was excluded from further analyses. This is because independent reliability transcribers did not agree with the transcription *his* in the subject position and transcribed the grammatically conventional *he*'*s* instead (see Vainikka, 1994 and Rispoli, 1998b, for a discussion of this transcription problem). This was actually only a problem for two children, and resulted in the loss of less than 10 utterances in the entire, 58 sample database. Agreement on the transcription of 3Psg subject pronouns ranged from 92% to 100% with an average agreement of 99%. When the 94 subject pronoun forms from these 12 segments were aggregated, there was a 99% agreement on 3Psg masc and fem subject pronouns.

Two one-hour tapes were randomly selected to assess independent reliability in the transcription of affixes and contractions. The overall agreement in transcription of affixes and contractions was 98% and 90%. The agreement in transcription of markers of 3Psg agreement (including contracted *is*, various auxiliaries, irregular verb forms and the regular suffix) was 100% and 96%. When the 121 instances of 3Psg markers were aggregated, there was 97% agreement on the presence of 3Psg markers.

Coding

All non-spontaneous child utterances, such as imitations of interlocutor utterances, self-repetitions, songs, poems and routines were eliminated from the corpora for the analyses reported in this paper. The data reported in this paper are based only on complete and fully intelligible child utterances. 3Psg masc and fem subject pronouns produced by the children were scored for correct or incorrect case forms. The expected environment for the nominative was defined as pre-verbal or pre-adjectival (e.g. *he want that*; *she happy*). Coding procedures yielded a total of 1170 3Psg masc and fem pronominal subjects. There were 665 *he* and 197 *she* correct subject pronouns. In addition, there were 71 *him* for *he* errors and 192 *her* for *she* subject pronoun case errors. All sentences with the obligatory context for 3Psg agreement markers were coded for the presence or absence of the obligatory marker (i.e. regular suffix–*es*, irregular verb forms *has*, *does* and *says*, auxiliary and copula *is*). There were approximately 4500 complete and intelligible sentences with 3Psg subjects in the database provided by these 29 children.

RESULTS

Correlation of subject case and 3Psg agreement

To test the hypothesis that nominative case and agreement were correlated, two correlational analyses were conducted; (a) the percent correct production of *he* with the percent production of agreement markers in obligatory contexts, and (b) the percent correct production of *she* with the percent production of agreement markers in obligatory contexts. By performing separate correlations for the masc and fem pronouns with 3Psg agreement marking, the double-cell effect that arises in the 3Psg fem pronoun could be isolated. All children used in these correlational analyses produced a minimum of five subject pronouns and a minimum of five sentences with obligatory contexts for agreement markers. As a result of this criterion, 28 children were used to test the correlation between the correct production of *he* and 3Psg agreement marking, whereas 20 children were used in testing the correlation between the correct production of *she* and agreement marking. Recall that Loeb & Leonard also used sentences with pronominal subjects in estimating the rate at which 3Psg agreement markers were supplied in obligatory contexts, resulting in a lack of independence between the two variables. In this study, sentences with 3Psg masc and fem pronoun subjects were not included among the sentences used for estimates of the rate of 3Psg agreement marking. In this regard, the two variables used in these bivariate correlations were independent. In addition, the variables of age and MWU were also included in the correlational analyses.

The correlation between the percent correct production of *he* and the percent correct production of agreement markers in obligatory contexts was significant, $r = 0{\cdot}42$, $p < 0{\cdot}05$ ($n = 28$) (see Fig. 1), whereas the corresponding

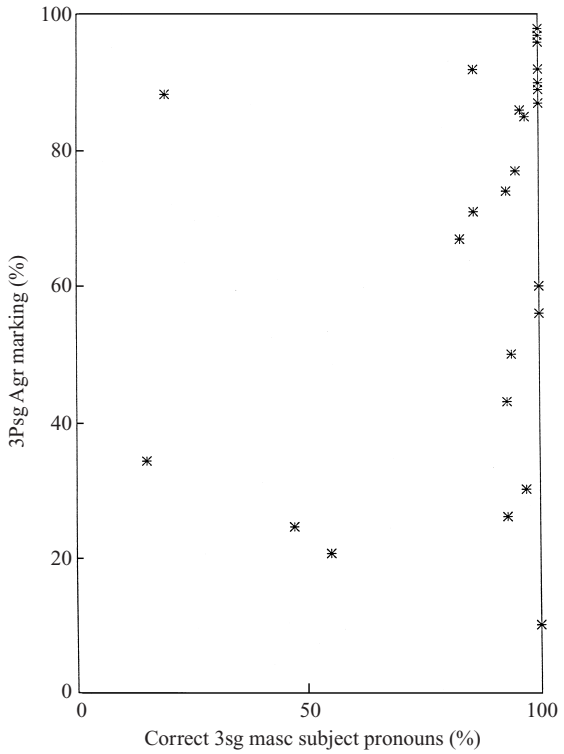

Fig. 1. The relationship between 3Psg agreement marking and 3Psg masc subject pronoun case.

correlation for the feminine pronoun *she* was not, $r = 0{\cdot}37$, $p > 0{\cdot}05$ ($n = 20$) (see Figure 2). MWU did not prove to be significantly correlated with the percent correct production of 3Psg subject pronoun case, but age was negatively correlated with the correct production of 3Psg masc subject pronouns, $r = 0{\cdot}40$, $p < 0{\cdot}05$. Visual inspection of the scatterplot in Figure 1 reveals that 10 of the 28 children in this analysis produced no 3Psg masc subject pronoun case errors. Seven of these 10 children produced 3Psg agreement markers in obligatory contexts 80% of the time or better. These seven children clearly 'anchor' the relationship of case and agreement. Only four children produced the correct nominative case *he* less than 60% of the time. Three of these four children produced 3Psg agreement markers in

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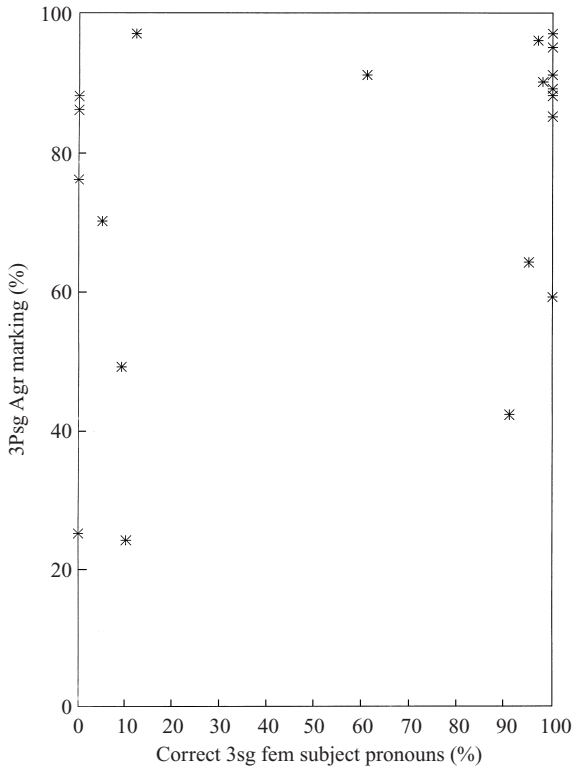

Fig. 2. The relationship between 3Psg agreement marking and 3Psg fem subject pronoun.

obligatory contexts less than 40% of the time. There was one outlier, a child who produced the correct nominative case *he* less than 20% of the time, and yet still produced 3Psg agreement markers in obligatory contexts over 80% of the time. Rote production of *it's*, *that's* and *what's* may well have made this child appear more competent than she truly was, although she still produced agreement marking 67% of the time with lexical NP subjects. The negative correlation of age and 3Psg masc subject pronoun production was probably due to the fact that this outlying child was 4;0. In sum, the significant correlation found between the percent correct production of *he* and the percent correct production of agreement markers in obligatory contexts is characterized by a group of children who were accurate at case and proficient at agreement, as well as a fair amount of variation among children who were less accurate at case marking.

Visual inspection of Fig. 2 reveals that the relationship between the case form of the 3Psg fem subject and 3Psg agreement was markedly different. Two groups of children emerged from the data: those who were accurate at

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producing the nominative *she*, and those who were not. The difference between these two groups was remarkable. Eleven children produced *she* 80% of the time or better, whereas eight children produced *she* less than 20% of the time. In fact, five children were categorical in their replacement of *her* for *she*. Children who were accurate at producing *she* showed a range of proficiency at 3Psg agreement marking in obligatory contexts, from approximately 40% to 100% of the time. There was a group of eight children who produced *she* accurately 100% of the time, who also produced 3Psg agreement markers 80% of the time or better, but this group was not large enough to result in a significant correlation. Moreover, there was a wide range of proficiency in 3Psg agreement marking among the children who produced *she* 20% of the time or less. That group of eight children produced 3Psg agreement marking in obligatory contexts anywhere from approximately 20% of the time to 100% of the time. Finally, there was only one child between these two groups. That child produced the nominative *she* accurately approximately 60% of the time and produced 3Psg agreement marking in obligatory contexts approximately 90% of the time. In sum, visual inspection confirms the lack of significant correlation, and further reveals two distinct groups of children, those who were very accurate at producing *she*, and those who produced *her* for *she* over 80% of the time.

The dependence of nominative case on 3Psg agreement marking

To test the hypothesis that correct production of correct nominative case depended upon the presence of 3Psg agreement marking, both binomial tests and chi square tests were used. To perform the binomial tests, it was necessary to estimate the probability of a correct nominative case subject given the presence of 3Psg agreement marking and the probability of a correct nominative case subject given the absence of 3Psg agreement marking. In essence, the former rate provided a test probability, a p value against which the latter was tested for a significant difference. In this test, nominative case was one value of a binomially distributed variable, with objective case the opposite value. A statistically significant outcome provided evidence for rejecting the null hypothesis of independence, whereas non-significance was interpreted as grounds for accepting the null hypothesis that case and agreement were independent. Alpha was set at 0·05. The binomial test was chosen over the more familiar chi square test for two reasons. First, the binomial test could be run on a smaller number of utterances. Secondly, the binomial test is a more direct test of Schutze's (1997) hypothesis than chi square. Schutze makes no prediction about the case of subjects in sentences lacking agreement marking (they may be nominative or non-nominative), but Schutze does predict that sentences with agreement marking should have nominative pronouns. Testing the probability of nominative case given agreement marking against an expected p-value derived from sentences

without agreement marking, seemed to be a natural translation of Schutze's hypothesis.

Of course an adequately large *n* is needed for any inferential test. Only a subset of the children produced enough sentences with subject pronouns, both nominative and non-nominative, across both conditions of agreement marking (i.e. presence vs. absence), to be used in the binomial test. Using a minimum of five sentences with pronominal subjects in both conditions of agreement as a cutoff, only seven children's data qualified for the binomial tests. A summary of the seven binomial tests is displayed in Table 1.

TABLE 1. *Distribution of sentences with pronominal subjects : agreement × case*

	3Psg agreement marking						
	+Agreement: Subject case			−Agreement: Subject case			
Child	*he/she*	*him/her*	*he/she* (%)	*he/she*	*him/her*	*he/she* (%)	Alpha
3	20	14	58	5	5	50	NS
8	3	4	43	2	5	29	NS
15	5	0	100	11	6	65	NS
23	13	5	72	14	5	73	NS
24	8	0	100	31	5	86	NS
28	4	1	80	13	12	52	NS
29	7	3	70	4	7	36	NS

Displayed from left to right are: (1) the child participants' numerical ID number; (2) the frequency of correct (nominative) subjects in sentences with 3Psg agreement markers; (3) the frequency of incorrect (objective) case subjects in sentences with 3Psg agreement markers; (4) the percentage of sentences with 3Psg agreement marking that had correct nominative case subjects; (5) the frequency of correct nominative case subjects in sentences lacking agreement; (6) the frequency of objective case subjects in sentences lacking agreement; (7) the percentage of sentences lacking 3Psg agreement marking that had nominative subjects; and finally, (8) whether the observed alpha was significant. As one can see from Table 1, none of the binomial tests were significant. Although it is true that the nominative case subject pronouns were usually produced at a higher rate in sentences with agreement than in sentences lacking agreement, for no child was the difference large enough to demonstrate the dependence of case on agreement.

Three children, children 3, 23 and 29 produced enough of the relevant sentences to perform a chi square test of association ($n \geqslant 5$ for all cells of the contingency table). None of the chi squares were significant. In sum, neither binomials nor chi square tests lent support to the hypothesis that 3Psg pronoun subject case was dependent upon 3Psg agreement.

Because a crucial empirical consequence of Schutze's (1997) hypothesis is that subject pronoun case errors cannot occur with expressed agreement, an appendix is provided with all of the sentences found in the corpora containing crucial counterexamples of subject pronoun case errors co-occurring with agreement. Eight children, with an age range of 2;6 to 4;0 produced 38 antithetical sentences. The great majority of these sentences, 37 of 38, had *her* subjects. This almost certainly reflects the influence of the double-cell effect (Rispoli, 1998b). It seems doubtful that these antithetical sentences can be characterized as mere noise in samples that otherwise clearly indicate a dependence of case upon agreement. The antithetical sentences represent a healthy proportion of the sentences that combined 3Psg masc and fem pronominal subjects and agreement marking produced by these eight children. In fact, they represent 21 % to 57 % ($M = 37$ %) of these children's output of such sentences.

DISCUSSION

Like Loeb & Leonard (1991) this study also found a correlation between subject pronoun case errors and 3Psg agreement. However, unlike the former study, the present research separated the errors of the 3Psg masc subject from those of the 3Psg fem subject, and found that only the 3Psg masc subject error rate was correlated with the marking of agreement. Recall that the rationale for two separate correlations was the possibility that the double-cell effect might seriously affect the relationship between case and agreement. It appears from this study that the double-cell effect nullified the correlation between case and agreement. This result is indirect evidence that the rate of pronoun case error is affected by the phonological composition of a pronoun's word specific paradigm, as first proposed in Rispoli (1994), and later revised in Rispoli (1998a; 1998b). However significant this finding may seem, it is still in need of verification in independently collected databases.

This research found no evidence of subject pronoun case being dependent upon the marking of agreement at the level of the utterance. Recall that one of the problems with Schutze's (1997) attempt to demonstrate dependence was that data were collapsed over a developmental period as long as six months. This introduced a confound, that sentences from an early point in development were being compared to sentences produced later in development. There was a distinct possibility that the significant chi square ratios Schutze found were actually reflecting the correlation of subject pronoun case and agreement marking over time. To eliminate this confound, the current study looked at children at one point in time, and found no evidence of dependence. Given the small *n* involved, this result is in need of further corroboration.

The picture that emerges from this study is the following. There is some correlation between the production of 3Psg subject pronoun case and the

marking of 3Psg agreement in obligatory contexts. This correlation is a relationshop that arises at the level of the individual child when that child is compared with other children. That is, in general, a child who is profficient at marking the 3Psg pronoun subjects correctly is more likely to mark 3Psg agreement. This relationship, however, can be derailed. In particular, the difficulties presented by learning a particular pronoun's paradigm can substantially affect this relationship. An example of the influence of pronoun paradigm building is the double-cell effect. Children who become entrenched in the substitution of *her* for *she* can, nevertheless, become quite good at marking agreement. Sentences such as those found in the Appendix, can then become a substantial part of the child's output.

Although this paper is about the relationship between 3Psg subject pronoun case production and 3Psg agreement marking, the research reported here has implications for the broader topic of co-development in morphosyntax. There is no doubt that case and agreement are related at the level of sentence production for adults (Levelt, 1989). But how are we to extrapolate from this fact, a viable and demonstrable hypothesis about the development of these two morphosyntactic subsystems? Demonstrating co-development is not a simple task. Factors such as the double-cell effect can interfere with relationships between developing subsystems. Moreover, even if two subsystems are correlated in development, they may not be inextricably linked at the level of sentence production.

Grammatical features interrelate in a highly abstract manner. Consider the features of finiteness and their relationship to case assignment. Whereas it is possible to express the relationship between +AGR, +TNS and nominative case in a precise, theoretically satisfying manner, we must not overlook the simple fact that all grammatical features are expressed in morphological or lexical form. Successful retrieval of those forms in the course of sentence production does not happen automatically in development. Even if grammatical features emerge together and could be said to co-develop IN THE ABSTRACT, their expression is still dependent upon lexical and morphological retrieval in real time. We have seen in this paper, that the double-cell effect has the potential to derail the correlation between case and agreement, resulting in marked individual differences in the pathways leading to the eventual coordination of case and agreement.

We are faced with another problem in creating viable hypotheses about co-development in morphosyntax. Feature checking on a scale large enough to handle the complex distinction between finite and non-finite clauses must be integrated in real-time. Co-development hypotheses have failed to consider what it means to check syntactic features against one another in real-time. This study suggests that between 2;6 and 4;0, feature checking is still not totally integrated into the real-time processes of lexical retrieval and sentence production. Until co-development hypotheses come to grips with these

performance aspects of morphosyntactic development, they will not be able to make accurate, detailed predictions about what happens at the level of sentence production in early childhood. This problem may become extremely serious when research is conducted on languages in which the agreement and case systems are more complicated than those of English.

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APPENDIX

The utterances in this appendix all contain a 3Psg masc or fem subject pronoun case error and the overt marking of 3Psg agreement. The children producing the utterances are identified by a numerical ID number and an indication of gender. The utterances are arranged by AGE and MWU.

Child 24 (m) MWU = 3·3 age = 2;6

*CHI: Her's a girl.

*CHI: Her wants to sit by grandma.

*CHI: Her's gonna sit right there.

*CHI: Her's # stuck.

Child 28 (f) MWU = 2·7, age = 2;7

*CHI: Her does it too!

Child 27 (f) MWU = 3·3 age = 2;7

*CHI: Her is # a baby a girl.

*CHI: Her is Magic.

*CHI: Her is a mommy now.

*CHI: Her is a mommy now.

Child 28 (m) MWU = 3·6 age = 3;1

*CHI: Her is older.

*CHI: Her likes some ketchup and some tato.

*CHI: Her puts it under water.

Child 8 (f) MWU = 3·6, age = 3;5

*CHI: Her needs get 〈in〉 [/] in front with Gramma.

*CHI: Her needs her dress on.

*CHI: No, her needs stay here.

*CHI: Her needs 〈get〉 [//] go somewhere.

Child 4 (m) MWU = 3·6 age = 3;6

*CHI: Let's see her goes on # here.

*CHI: And her's got her pick her up.

*CHI: And ⟨her⟩ [/] her's got hold her and walk downstairs.

*CHI: Here her goes on her head!

*CHI: Her's getting shots.

*CHI: Her's on backwards.

*CHI: Now her's on forwards.

*CHI: Her's walk her fingers.

Child 3 (f) MWU = 3·8 age = 3;6

*CHI: Her's gon go in here.

*CHI: Her's gon have for dinner a hay.

*CHI: Now her fits there, yep.

*CHI: ⟨Now⟩ [/] now her has to go on a ⟨s⟩ [/] # slide.

*CHI: Hey, her's trapped now.

*CHI: Her's gonna lay and watch.

*CHI: Yeah, and her's dirty, ⟨and her⟩ [//] and this one is stupid.

*CHI: her is all clean.

*CHI: Her's lost.

*CHI: ⟨Her's in⟩ [/] her's in bed.

*CHI: Her wants the ⟨ha⟩ [/] hat on.

*CHI: Her's going to party.

*CHI: Her's gonna teetertoter.

Child 14 (f) MWU = 4·4 age = 4;0

*CHI: Him is # crying a little bit.