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PRAGMATIC AND GRAMMATICAL PROPERTIES OF SUBJECTS IN CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT

JEANNETTE SCHAEFFER
schaeffe@ucla.edu
jschaef@bgu.ac.il

This study reports the results of an investigation of subject properties in the spontaneous speech of 14 4-year old English speaking children with Specific Language Impairment (SLI) and two control groups (age and MLUm). It is shown that while the children with SLI perform much below their age-level with respect to grammatical properties of subjects (subject-verb agreement, subject case), they behave adultlike on pragmatic properties of English subjects (subject-drop). This finding provides support for (i) the hypothesis that grammar and pragmatics are two independent language components, each of which develops at its own pace, and (ii) the hypothesis that children with SLI are impaired in their grammar, but not in their (non-linguistic and interface) pragmatics.

1. INTRODUCTION

Traditionally, Specific Language Impairment, or SLI, is considered a disorder that affects language, but no other cognitive function, hence the term: *Specific* Language Impairment. Many researchers nowadays agree that the disorder is even more specific: it mainly affects grammar, while other components of language, such as the lexicon or the pragmatic system remain mostly unimpaired.

One of the reasons to study Specific Language Impairment (SLI) in children is to gain insight in language organization and language development (Leonard, 1998, among others). An important hypothesis regarding these two related issues has been proposed by Fodor (1983) and Chomsky (1986), namely the Modularity Hypothesis, as informally described in (1):

(1) *Modularity Hypothesis*
The view of cognition in general, and language, in particular, as arising from a complex interaction of various cognitive domains and further, that these domains are autonomous in the sense that they are governed by distinct principles.

This description suggests that we can distinguish two types of modularity, as in (2):

(2) A. modularity of cognition (with language being one of the modules) – "Big Modularity" (Levy & Kave, 1999);
B. modularity of language – "Small Modularity" (Levy & Kave, 1999)

Results of studies on Specific Language Impairment showing that impairment can be isolated to language alone provide support for a Modularity Hypothesis corresponding to A: Big Modularity. As for the one in B, or Small Modularity, the question arises as to what components language itself consists of. We take a Chomskyan view of language as a starting point, and assume the components of language to be as in (3):

(3) *Components of Language*

I. Lexicon
II. Computational System: Grammar:
- morphosyntax
- semantics
- phonology

Processor/Parser
III. Pragmatic System

This study focuses on the question whether and how the Computational System, in particular, the Grammar and the Pragmatic System are distinct components. To this end, it examines grammatical and pragmatic data of the special population of children with SLI, and compares them with the language of typically developing (TD) children. It is hypothesized that children with SLI are not impaired in certain parts of the pragmatic component of language (to be made precise in section 2), but that they do have impairments in their grammar.

Our participant pool consists of a group of English speaking children diagnosed with SLI. Using their spontaneous speech transcripts we investigate the pragmatic and grammatical properties of *subjects*. The results show that the children with SLI perform well on the pragmatic properties, but less well on the grammatical properties. In contrast, (younger) TD children make errors with respect to both the pragmatic and the grammatical properties.

These results provide evidence for the division of labor between *grammar and pragmatics*, i.e. they support the hypothesis that language is modular. Moreover, the present study makes the modularity model more precise, in that it makes claims as to which properties of certain linguistic phenomena belong to grammar, and which ones to pragmatics. Furthermore, the comparison with TD child language contributes to theories of typical language acquisition. While it is often difficult to tease apart grammatical and pragmatic development in TD children, children with SLI provide a unique opportunity to study (prolonged) grammatical development against the background of a target-like pragmatic system. Assuming that children with SLI proceed through similar grammatical stages as TD children, but much more slowly, studying their language sheds light on controversial issues in typical language acquisition.

2. PRAGMATICS

2.1. *Studies on pragmatics in English acquiring children with SLI*

An investigation into the literature on the pragmatic abilities of children with SLI reveals a variety of results. In some studies, children with SLI perform below the level of MLU/language matched controls (Geller and Wollner, 1976; Snyder, 1975; 1978; Watson, 1977; Sheppard, 1980; Siegel et al., 1979; Stein, 1976; Tallal, Curtiss and Kaplan, 1988). These studies evoke the question of whether the weaker morphosyntactic abilities of the children with SLI restrict their ability to exhibit pragmatic knowledge that they do possess or whether they really lack certain pragmatic principles. In other studies, no differences in pragmatic abilities between children with SLI and their controls are found (Meline, 1978; Rowan et al., 1983; Prinz, 1982; Prelock et al., 1981). To make the picture even more confusing, another set of studies reports that the children with SLI perform at higher levels than their MLU controls in terms of pragmatics (Leonard et al., 1982; Johnston et al., 1993; Leonard, 1986; Craig and Evans, 1989).

Van der Lely (2003) argues that although children with impairments merely in their pragmatics have been identified, the difference with children with typical SLI appears clear: children with pragmatic language impairment show little overlap in linguistic characteristics with those children with grammatical impairment (van der Lely, 2003). Nevertheless, Bishop (1997; 2000) suggests that pragmatic disorders may also co-exist with grammatical impairment. She proposes that pragmatic impairments may be a) secondary consequences of SLI; b) an indication of autism spectrum disorder, or c) a syndrome in and of

itself. The first option finds support in studies by Rice, Sell and Hadley (1991) and Hadley and Rice (1991), who argue that children with SLI experience a negative spiral: because of the awareness of their impairment they become increasingly unwilling to engage in interactions with peers after experiencing lack of success. This results in a decrease of sentence initiation, question formation, response, turn-taking, etc. However, evidence to the contrary has been put forward by Bishop and Adams (1989) who show that certain kinds of pragmatically inappropriate language use cannot be accounted for by difficulties in sentence formation (e.g. providing much too much or too little information to the conversational partner, using stereotyped utterances, using abnormal prosody). The second option is defended by Shields, Varley, Broks and Simpson (1996a; b), who report close overlap in test profile between a group with what they call "semantic-pragmatic disorder" and children with high-functioning autism. However, the same study and other studies note that many children with pragmatic difficulties fall short of meeting diagnostic criteria for autistic disorder. As for the third option, Rapin and Allen (1983) and Bishop and Rosenbloom (1987) characterize a separate subtype of language impairment in which structural aspects of language (phonology and grammar) are relatively intact, but use of language is abnormal. Although they did find some children with relatively good mastery of syntax and phonology and poor pragmatics,[1] Bishop and Adams (1991; 1992) and Bishop et al. (2000) found a small positive correlation between children diagnosed as phonologically-syntactically impaired and children diagnosed as pragmatically impaired.

In summary, there is no clear picture of the status of pragmatic skills in children diagnosed with SLI. One of the reasons for this vagueness may be the relative imprecision with which pragmatic skills are defined. Although they do not always make it explicit, most studies reporting pragmatic deficits in children with SLI seem to concern pragmatic abilities such as speech acts, conversational participation and discourse regulation (initiations, replies, topic maintenance, turn taking, utterance repair, etc.), and code switching. Partially following Bishop (2000) and references therein, we hypothesize that difficulties with these types of pragmatic abilities may follow from problems with sentence formation (as children with typical SLI have) or, alternatively, are the consequence of an additional autism spectrum disorder.

[1] If pragmatics can be impaired independently, without affecting other components of language, this provides support for the modularity of language, i.e. for the hypothesis that there is an independent pragmatics module.

As we will see in section 2.2 pragmatic abilities such as speech acts, conversational participation and discourse regulation, etc. constitute only a sub-part of the pragmatic system, which we will refer to as "linguistic pragmatics". This is not the part of pragmatics that we focus on in this book. Rather, the present study concentrates on different sub-parts of the pragmatic system, named "interface pragmatics" and "non-linguistic pragmatics".

2.2 Different types of pragmatics

In accounts of linguistic phenomena, including language acquisition data, the pragmatic system is sometimes used as a 'waste basket'. In such cases, phenomena that cannot be explained by linguistic principles or constraints are claimed to be due to (the lack of) a pragmatic principle, without much further discussion as to what the pragmatic system might look like. In order to avoid such 'abuse' of the pragmatic system one should cast her theories in a model of language that takes pragmatics seriously. Moreover, if pragmatics is invoked in the explanation of a certain linguistic phenomenon, one ought to make explicit which theory about the organization and nature of pragmatics is adopted.

In the present study, we take pragmatics to be a component of language, which lies outside the Computational System and the Lexicon (cf. the model of language we presented in section 1). However, in this model all pragmatic knowledge is included under one category. A closer look at what comprises pragmatic knowledge allows us to differentiate several pragmatic types and even classify such skills discriminantly as, for example, modular, or showing interaction with the Computational System. A modular model of pragmatics such as that proposed by Kasher (1991) is useful for these purposes.

Kasher (1991) defines pragmatic knowledge as "the knowledge of appropriateness relations between sentences and contexts of use" (Kasher 1991: 389). He views the pragmatic system as two different pragmatic competences: a purely linguistic pragmatic competence, and a non-linguistic pragmatic competence. As for linguistic pragmatics, Kasher hypothesizes that it is represented in our minds as a cluster of modules, whereas non-linguistic pragmatics is related to general cognitive systems, such as that of intentional action. Furthermore, he suggests an interaction device, namely interface pragmatics, which takes care of the application of general principles of intentional activity to particular cases of linguistic activity. Below we discuss the three types of pragmatics in more detail.

We adopt Kasher's (1991) notion of linguistic pragmatics to refer to speech acts, conversational participation and discourse regulation (initiations, replies, topic maintenance, turn taking, utterance repair, etc.), and code switching. As we hinted at in section 2.1, it is feasible that these types of pragmatic skills are shaped by morphosyntactic abilities, and thus, problems with these pragmatic skills might be caused by difficulties in morphosyntax. For example, if verbal inflection is impaired, this may affect the production of a correct imperative, i.e. the speech act of a command or a request. If there are problems with movement (see work by van der Lely and colleagues), this may have an impact on the formulation of, for instance, questions or relative clauses.

In addition to linguistic pragmatics, Kasher distinguishes non-linguistic pragmatics - a central, non-modular cognitive system with general principles of intentional action which apply to linguistic structure, but also to the output of other, non-linguistic functions. The system of non-linguistic pragmatics contains principles that are responsible for, for instance, *forming and revising beliefs*, politeness, registry, and style. As for its interaction with morphosyntax, it is not obvious that verbal or nominal inflections or word order directly influence the formation/revision of beliefs, politeness, style, etc., or vice versa, for that matter.

Finally, Kasher characterizes interface pragmatics as "[...] pragmatic knowledge which involves integration of data from a linguistic channel with data from other channels. For example, understanding certain indexical expressions, such as *she* or *there,* involves integration of the output of a language module with the output of some perception module, each serving as input for some central unit which produces the integrated understanding of what has been said in the context of utterance." (Kasher, 1991: 391). In this sense, interface pragmatic principles regulate application and integration between principles of non-linguistic pragmatics and linguistic outputs. This takes place in, for example, the comprehension of conversational implicatures or indirect speech acts: general cognitive principles (non-linguistic pragmatics) are applied to linguistic structures. In terms of production, we could say that integration needs to occur between the output of the Computational System and the output of other cognitive systems before the utterance can be spelled out. As Kasher (1991) notes, it remains to be determined whether interface pragmatics takes the form of a special pragmatic interaction device, or module, or whether it is part of a more central cognitive notion, such as intentional action.

Referring back to Kasher's pronoun example, notions such as "reference" and "presupposition" seem to involve both non-linguistic pragmatics and interface pragmatics. Interface pragmatic principles integrate the output of the Computational System, for instance, a nominal expression, with the output of non-linguistic pragmatic rules that regulate knowledge about speaker and hearer beliefs, resulting in, for example, a definite or an indefinite expression. In this sense, interface pragmatics immediately influences the realization of certain linguistic structures, such as the above-mentioned choice between definite and indefinite nominal expressions, the choice of pronominal elements versus noun phrases, and, in turn, their correct position in the syntactic structure. It is exactly this part of pragmatics that is relevant for our discussion of subjects. A summary of Kasher's three types of pragmatics is provided in (4):

(4)

Linguistic Pragmatics	*Non-Linguistic Pragmatics*
modular	non-modular
- direct speech acts	- forming/revising beliefs
- conversational participation	- politeness
	- registry
- discourse regulation	- style
- code switching	

Interface Pragmatics
modular?
- conversational implicature
- indirect speech acts
- reference
- referentiality
- presupposition

In order to obtain an answer to the question as to whether the pragmatic system of children with SLI can be impaired in its own right, and is not a secondary consequence of impaired grammar (see Bishop's (2000) option a), as described in section 2.1), we should investigate either non-linguistic pragmatics, or interface pragmatics, or both (recall that linguistic pragmatic deficits could be a consequence of impaired grammar, as discussed in sections 2.1 and 2.2). In the next section we discuss a concept that is likely to be part of non-linguistic pragmatics. Being applied to outputs of the grammar by interface pragmatics, it has an impact on the realization of certain linguistic phenomena, including the realization of subjects.

2.3. *Speaker/Hearer Beliefs and the Concept of Non-Shared Assumptions*

In order to use referential expressions correctly, a speaker needs to be aware of the hearer's current beliefs or assumptions. For example, a speaker cannot refer to an object which has not been mentioned in the preceding discourse or is not present in the situational context with a definite determiner, or with a pronoun. The question is what exactly the principles are that govern the appropriate use of referential linguistic elements such as definite expressions and pronouns. We propose that one of them is the "Concept of Non-Shared Assumptions" (Schaeffer, 1999; 2000; Matthewson & Schaeffer, 2000; Schaeffer & Matthewson, 2005). This concept makes crucial use of the notions "Speaker Assumptions" and "Hearer Assumptions", which we will explain first.

In a conversation between two individuals, a speaker needs to take into account the interlocutor's beliefs. For example, if a speaker starts a conversation out-of-the-blue with the sentence: "The tree fell down" in a situation in which there is no tree visible, her interlocutor/hearer will be confused, because the use of the definite determiner *the* implies that the reference of the noun *tree* is believed to exist not only by the speaker, but also by the hearer. The hearer does not believe the reference of *tree* to exist because it has not been introduced to her in the preceding discourse. Consequently, communication break-down takes place. This phenomenon is also referred to as "Presupposition Failure". Similar break-downs occur when definite pronouns (*she*, *her*, *them*, etc.) are used out-of-the-blue.

We propose that break-downs such as the ones described above are the result of a failure in interface pragmatics, namely in the application of the "Concept of Non-shared Assumptions" (henceforth CNSA), which, in turn, we assume to be part of non-linguistic pragmatics. The CNSA is defined in (5):

(5) *Concept of Non-Shared Assumptions (CNSA)*
Speaker and hearer assumptions are always independent.

The CNSA expresses an obligation for the speaker to consider the hearer's assumptions/beliefs as a separate entity and therefore as something that is in principle different from the speaker's assumptions. However, in certain cases, speaker and hearer assumptions may coincide. If the CNSA is absent (from the non-linguistic pragmatics system), or fails to apply (in the interface pragmatics system), speaker and hearer assumptions are not always independent, implying that there are situations in which the speaker automatically attributes his/her own assumptions to the hearer.

Returning to SLI, investigating knowledge of speaker/hearer beliefs in children with SLI can provide a better insight into the question whether (non-linguistic and interface) pragmatics can be problematic for children with SLI in their own right (or not), rather than being the consequence of impaired morphosyntax. The answer to this question may then provide (counter-)evidence regarding the hypothesis that language is modular, in particular, that pragmatics constitutes a module separate from the Computational System.

In order to investigate the interface and non-linguistic pragmatic abilities of children with SLI we analyze one linguistic effect of the application of the CNSA, namely the realization of subjects. To make a comparison with the children's grammatical abilities we also investigate the purely grammatical properties of subjects in English, such as subject-verb agreement and Nominative case. But before we turn to SLI, we first outline the grammatical and pragmatic properties of subjects in adult language and in TD child language.

3. SUBJECTS IN ADULT ENGLISH

3.1. *Grammatical properties: Subject-verb agreement and Nominative case in adult English*

Subjects display certain obvious syntactic properties, such as agreement with the verb, and case. As is well-known, English subjects only trigger overt person/number agreement on the verb in 3rd person singular for main verbs (1a) and the auxiliary verbs *DO* and *HAVE* (6b, c), and in all persons for the verb *TO BE* (6d):

(6) a. Susan cycle*s* to the supermarket every day.
b. Doe*s* Bill like falafel?
c. Stephanie ha*s* eaten the entire cake.
d. I *am* / you *are* / she *is* / we *are* / you *are* / they *are* happy.

As for case, adult English subjects bear Nominative case (NOM) and this is marked overtly only on pronouns. Thus, most subject pronouns are distinct in their form from object and possessive pronouns, as illustrated in (7) for the first person singular pronoun:

(7) a. I/*me/*my saw Jane yesterday.
b. Bill invited me/*I/*my to the party.
c. Has anyone seen my/*I/*me keys?

We will see later that these grammatical subject properties are problematic in the language of both (young) TD children (section 3.2) and in children with SLI (section 7).

3.2. *Pragmatic properties: The overtness of subjects in adult English*

In addition to agreement and case, subjects show variability in terms of overtness. Unlike in so-called *pro*-drop languages such as Italian and Spanish, whose grammars license empty subjects, finite clauses in adult English require overt subjects. However, it has been observed that in certain circumstances English does allow non-overt subjects in finite clauses. For example, Haegeman (1990a) points out that 1st person subjects may be non-overt in diary contexts, a phenomenon referred to as "diary drop", illustrated in (8) (the underscore indicates a null subject):

(8) *Diary drop*

a. A very sensible day yesterday. __ *saw* no one.
__ took the bus to Southwark Bridge. __ walked along Thames Street. . . .
(Virginia Woolf, *Diary*. Vol.5, 1936-1941, pp.203-204)

b. __ left the party *exhausted*.

c. __ hurt *myself* when trying to cut the roses.

Based on the following evidence, Haegeman argues that the subject of such sentences while non-overt is nevertheless syntactically represented. The non-overt subject is assigned the external theta-role of the verb, for example, in (8a) the non-overt subject is understood as the EXPERIENCER of *see*. In (8b) we see that the non-overt subject can take a predicative adjective, such as *exhausted*. A non-overt subject can also bind a reflexive anaphor, namely *myself*, as in (8c). Adopting Haegeman's claim that non-overt subjects in English are syntactically represented, non-overt subjects will be represented as *ec* (empty category) from now on.

Haegeman (1990a) further shows that besides 1st person singular it is also possible to drop 1st person plural and 3rd person subjects in diary contexts, as illustrated in (9):

(9) a. *ec* saw no one after we had left the party.
b. Can I describe Old Kot yesterday? *ec* had hurt himself while trying to cut the roses.
(Haegeman 1990a: 165-166)

A similar phenomenon can be observed in colloquial spoken English. The examples in (10) are from Thrasher (1977):

(10) a. *ec* really appreciate the help.
b. *ec* perjured himself again last night.
c. *ec* shouldn't leave that purse unattended.
d. *ec* thought I heard something.
e. When you get a minute, *ec* like to have a word with you.
f. This time next month, *ec* won't be able to buy beef at any price.

In addition to the syntactic reality of non-overt subjects in adult English, Haegeman (1990a, b) points out some syntactic constraints on the distribution of non-overt subjects. They do not occur after preposed elements such as Wh-elements, topicalized objects and inverted auxiliaries, as illustrated in (11)[2]:

(11) a. *When will *ec* be able to meet him? (Wh-question)
b. *How stupid *ec* was! (Wh-movement)
c. *This book, *ec* did not approve of. (Object topicalization)
d. *Will *ec* be able to meet him? (Yes-no question)

Furthermore, they do not occur in embedded clauses, as shown in (12):[3]

(12) *I wonder when *ec* will see her again.

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[2] Although non-overt subjects are not restricted to the first position of the clause, which is exemplified in (5f) above and in (i):
(i) a. <u>So</u> *ec* shall stop writing for a day (Haegeman 1990: 163-4)
b. <u>At night</u> *ec* sent a packet to London (Haegeman 1996: 27)
Adverbs/adverbial phrases seem to be the only constituents that can precede a null subject in adult English. For an elegant explanation of this apparent anomaly in the distribution of English null subjects, see Horsey (1998).

[3] But see Haegeman & Ihsane (1999; 2001) for a discussion of embedded null subjects in some dialects/registers of adult English.

Besides syntactic constraints on subject drop in English, Haegeman (1990a, b) notes a pragmatic one. The referent of *ec* must be recoverable from the context: only subjects that are discourse topics can be omitted. As we will see in section 5, this observation is a crucial one regarding the predictions for the children with SLI. It leads Haegeman to a *topic*-drop account à la Huang (1984) of null subjects in adult English.

Haegeman's (1990a, 1990b) original analysis hinges on the idea that *ec* must be some kind of *wh*-trace. *Wh*-traces are left by elements which undergo movement to an A'-position. Topicalization structures have been analyzed as involving movement to a pre-sentential A'-position, possibly spec CP (Huang, 1984; De Haan & Tuijnman, 1988, Cardinaletti, 1990), as illustrated in (13):

(13) $[_{CP}$ Ginger$_i$ $[_{IP}$ I only like t_i with sushi]]

Parallel to topicalization structures with an overt topic there can be structures with a non-overt topic. The argument is topicalized leaving a trace or variable in argument position. The topic can subsequently be dropped in the sense that an empty operator can be inserted in topic position. This empty operator binds the argument trace (it is coindexed with this trace). This is illustrated in (14):

(14) $[_{CP}$ TopicOp$_i$ $[_{IP}$ *ec*$_i$ saw no one]]

The operator itself is syntactically licensed because it occurs in initial position (Huang, 1984; Cardinaletti, 1990, Rizzi, 1992). From this position it can create a link with the discourse. The null topic is interpreted by identification with a salient discourse element. By coindexation the argument trace is thus identified (via the operator) with a discourse element. See Huang (1984) for a more detailed discussion.[4]

[4] Rizzi (1992; 1994) develops a slightly different analysis of English diary-drop. On the basis of Lasnik and Stowell (1991) he argues that the non-overt subject in English diary-drop is not a variable, but rather a null constant. As Lasnik and Stowell (1991) claim, only the trace bound by a genuine quantifier is a variable; the trace bound by the non-quantificational empty operator (such as the Topic Operator) is not, it is a null constant. However, A'-positions such as spec CP are not suitable hosts for the null constant. A null constant is only possible if the specifier of the root is an A-position. In order to solve this problem Rizzi invokes an axiom stating that the root of a sentence must be CP. This principle is weak in that it may be 'turned off' in certain special situations, for example in diary contexts. If the "CP = Root" principle is not active CP is not projected and IP is the root. The specifier of IP is an A position, and thus a null constant in spec IP is licit.

However, there are several problems with this analysis. As Haegeman (1990a, b) points out, if the non-overt subject is the trace of a null topic operator, then why is the phenomenon restricted to subjects? In adult English, subjects can be dropped, objects cannot, as can be seen in (15):

(15) a. *ec* saw her at the party.
b. * I saw *ec* at the party.

In addition, diary drop displays non-overt expletives and quasi-arguments, as in the examples in (16):

(16) a. *ec* rained in the night, wind, rain, and hail
(dropped subject: *it*)
b. *ec* isn't much we can do about it
(dropped subject: *there*)
(Haegeman 1996a: 13).

Expletives and quasi-arguments such as in (11a and b) respectively, cannot receive a topic interpretation, since they do not have a referent.

In later work Haegeman solves these problems by proposing that the subject *ec*s in diary drop are 'null constants' rather than topics (Haegeman, 1996b; 1997; see also Rizzi, 1994; 1997). Null constants can occupy A(rgument) positions, and may thus represent dropped expletives or quasi-arguments. They are licensed only in the leftmost position of the clause. It is this position that enables *ec* to be identified with an antecedent in the discourse. Thus, only if *ec*s can move to sentence-initial position, are they licensed. If the *ec* cannot raise for some syntactic reason (possibly because of relevant intervening material) it fails to be licensed and the sentence cannot appear with a null subject. [5]

Now let us turn to the pragmatic requirements of a non-overt subject. Following Haegeman (1990a; 1990b; 1996), among others, we assume that *ec*s must be identified by a referent in the discourse. Identification is the process whereby *ec* is coindexed with some expression, for example, a pronoun or a definite description. According to Larson and Segal (1995: 201-206) the semantic process of coindexation involves

As for the identification requirements of English null subjects, Rizzi's analysis converges with topic-drop theories: Empty categories in the topmost position of the structure can be identified directly by discourse.

[5] This explains the rarity of non-overt objects in adult English: the material between the null object constant and its trace is such that it breaks the chain between the two.

contextual determination of semantic values for variable-reference terms such as pronouns and definite descriptions by assigning them a numerical index equal to the index of their referent in an infinite sequence of entities. This referent must be salient for all discourse participants.

As many researchers of semantics and pragmatics have pointed out, saliency of a referent is not necessarily always achieved by verbal discourse, or "linguistic context", as we will call it. A referent can also be salient by virtue of a "situational context". Consider the following examples from Thrasher (1977: 19), uttered by a customer at a clothing stall who is holding a garment (17a) and by someone standing in front of a vending machine (17b):

(17) a. *ec* feels like real silk
b. *ec* must be broken

These sentences could be used discourse-initially, so that the referent of *ec* would not be salient in previous discourse, but must be salient instead in the non-linguistic situational context in which the utterance is made.

The question is what entity is regarded as salient in a given context. More formally stated: For a given instance of *ec*, how do we select the set of entities over which the interpretation of *ec* could possibly range, and how is the most plausible candidate chosen from that set? A key to the answer to this question might lie in the pragmatic Principle of Informativeness (Greenfield & Smith, 1976; Clancy, 1993; 1997, 2003), which is formulated in (18):

(18) *Principle of Informativeness*
Omit uninformative arguments.

The principle in (18) of course raises the question as to what makes an argument uninformative. Allen (2000) attempts to make this concept precise by listing a set of eight features that have been shown to influence argument representation in other languages. She bases herself on work by Clancy (1993; 1997), Greenfield and Smith (1976), Givón (1983), Chafe (1987), and Du Bois (1987). The features are divided into three groups: I. Knowledge features; II. Confusion features; III. Search-space features. All these features are binary; they are either + or -. A + value indicates informativeness, while a – value points to uninformativeness. Below we present a summary of Allen's description of these three groups.

Knowledge features concern the presence of the referent in the common ground between the speaker and the hearer, whether that common ground is established by the linguistic or the situational context. They include three features: ABSENCE, NEWNESS, and QUERY. ABSENCE characterizes a referent that is not present in the situational (physical) context of the conversation. A null argument whose referent is [+ABSENCE] is harder to identify than a null argument whose referent is [-ABSENCE]. NEWNESS characterizes a referent that is new to the immediate linguistic discourse, i.e., if it has not been mentioned in the preceding 20 utterances (Chafe, 1976; Givon, 1983; Du Bois, 1987). First and second person arguments are all classified as non-new, following Chafe (1976) and Du Bois (1987). A [+NEWNESS] referent is more informative than a [-NEWNESS] referent, making argument drop less felicitous. QUERY characterizes a referent that is the subject of a question or the response to a question. The identity of a [+QUERY] referent is much less certain than it would be if the referent were already given in the context (a [-QUERY] referent), and thus a null argument would be less felicitous.

As for Confusion features, they concern the resolution of potential confusion about the identity of a referent when various potential referents are present in the linguistic or situational context. Allen (2000) distinguishes three confusion features: CONTRAST, DIFFERENTIATION IN CONTEXT, and DIFFERENTIATION IN DISCOURSE. CONTRAST characterizes a referent that the speaker is explicitly contrasting with other potential referents in the linguistic or situational context. This is usually done through tone of voice, gesture, or other contextual means. The value [+CONTRAST] signals a change in the current situation, and therefore makes the referent new information. In such a case a null argument is less felicitous. DIFFERENTIATION IN CONTEXT characterizes a referent that is one of two or more potential referents in the situational context. A [+DIFFERENTIATION IN CONTEXT] referent causes uncertainty in the identification of the target referent, and therefore, an argument with such a referent is less likely to be null. DIFFERENTIATION IN DISCOURSE characterizes a referent that is one of two or more potential referents already established in the linguistic discourse, more precisely, in the five preceding utterances (Givón, 1983). A null argument with a [+DIFFERENTIATION IN DISCOURSE] referent is less felicitous than a null argument with a [-DIFFERENTIATION IN DISCOURSE] referent.

Finally, the Search-space features concern differences in the relative size of the search space one must consider to find the target referent. Allen (2000) distinguishes two features in this group: INANIMACY

AND THIRD PERSON. INANIMACY characterizes referents that are not animate. In typical discourse the number of animate entities (humans, animals) is usually smaller than the number of inanimate entities. In other words, the search space for inanimate referents is larger than the search space for animate referents. A null argument with a [+INANIMATE] referent is therefore harder to identify than a null argument with an [-INANIMATE] referent. THIRD PERSON characterizes a referent that is not first or second person. In typical discourse, the number of potential third person entities is usually larger than the number of first and second person entities. Thus, the search space for [+THIRD PERSON] referents is larger, which makes it less likely for the corresponding argument to be null.

The eight features described above contribute to the (un)informativeness of the referent in question. Note that a referent can be described as (un)informative only if the assumptions of the hearer are taken into account. Since it is plausible to assume that the referent of a null argument is always uninformative to the speaker (the speaker knows the referent of the argument s/he drops) (un)informativeness is really determined from the point of view of the HEARER. The more uninformative the referent is to the hearer, the more salient it is, and therefore the more felicitous it is to omit the argument. In other words, a pragmatically ideal null argument would have a referent that has a – value for all eight informativeness features.

Let us now review the null subjects in the examples given so far and see if these arguments have uninformative referents. First, the diary drop constructions, which are repeated in (19):

(19) *Diary drop*

a. A very sensible day yesterday. __ *saw* no one.
__ took the bus to Southwark Bridge. __ walked along Thames Street. . . .
(Virginia Woolf, *Diary*. Vol.5, 1936-1941, pp.203-204)

b. __ left the party *exhausted*.

c. __ hurt *myself* when trying to cut the roses.

All null subjects in the sentences in (19) have the first person singular referent *I*. This follows from the nature of diaries, which are written in first person singular. Furthermore, the referent of the pronoun *I* is generally either the author or a fictive person introduced at the beginning or in the title of the diary. In other words, general world knowledge provides us with the referent for diary drop null subjects.

The application of Allen's (2000) eight informativeness features to the diary drop null subjects in (19) leads to the following results. As for the Knowledge features, the referent, the speaker/writer, is not absent from the situational context, and thus it has the feature [-ABSENCE]. By virtue of being 1st person the referent has the feature [-NEWNESS]. Furthermore, the referent is [-QUERY] because it is not the subject of or the response to a question. With respect to the Confusion features, the referent is [-CONTRAST] because there is no contrast between potential referents. It is also [-DIFFERENTIATION IN CONTEXT] because there is only one potential referent in the situational context, namely the author or the fictive person introduced at the beginning or in the title of the diary. The feature [DIFFERENTIATION IN DISCOURSE] is irrelevant because there are neither 'only one' nor 'two or more potential referents' already established in the five preceding utterances. Finally, for obvious reasons, the Search-space features for the referents of the diary drop null subjects in (19) are [-INANIMACY] and [-THIRD PERSON].

In summary, the referents of the diary drop null subjects in (19) are: [-ABSENCE], [-NEWNESS], [-QUERY], [-CONTRAST], [-DIFFERENTIATION IN CONTEXT], [-INANIMACY] and [-THIRD PERSON]. The negative values of seven out of the eight informativeness features make for a high degree of uninformativeness, or, in other words, a high saliency of the referent, and thus the pragmatic requirements for being a null argument are satisfied. Since all the syntactic requirements for null subjects are also met in these sentences, the subject can be null.

The next set of subject drop examples, in which there is a 1st person plural null subject (a) and a 3rd person singular null subject (b) is repeated in (20):

(20) *First person plural and 3rd person singular*

a. *ec* saw no one after we had left the party.

b. Can I describe Old Kot yesterday? *ec* had hurt himself while trying to cut the roses.
(Haegeman 1990a: 165-166)

How can we pragmatically characterize the referents of these null subjects? The Knowledge features are all negatively specified. Since the referent of the null subject in (20a) includes the speaker, who is never absent from the situational context it has the feature

[-ABSENCE]. It is also [-NEWNESS] because it is 1st person. In addition, it is classified as [-QUERY] as it is not the subject of or the response to a question. As for the Confusion features, the referent is [-CONTRAST], because there is no contrast emphasized between potential referents. Regarding DIFFERENTIATION IN CONTEXT it could be argued that there are two potential referents in the situational context, namely *we* and *I*. Therefore, it gets classified as [+DIFFERENTIATION IN CONTEXT]. The feature DIFFERENTIATION IN DISCOURSE is irrelevant again because there is no mention of a referent in the preceding linguistic discourse. The Search-space features INANIMACY and THIRD PERSON are both classified negatively. Thus, we end up with a referent that is [-ABSENCE], [-NEWNESS], [-QUERY], [-CONTRAST], [+DIFFERENTIATION IN CONTEXT], [-INANIMACY] and [-THIRD PERSON]. Six out of the eight informativeness features are negatively specified, one is positively specified, and one is irrelevant. The null subject in (20a) shows that this is (pragmatically) sufficient to be omitted.

Consider now the third person null subject in (20b). The first Knowledge feature is specified positively, [+ABSENCE], because it is unlikely that "Old Kot", the referent of the null subject is present in the situational context. Since the referent was mentioned in the immediately preceding utterance, it has the feature [-NEWNESS]. It is also [-QUERY] because of the sentence's declarative status. Two of the Confusion features are specified negatively, namely [-CONTRAST] (no contrast is emphasized between potential referents), and [-DIFFERENTIATION IN DISCOURSE], because there is only one potential referent in the preceding linguistic discourse, namely "Old Kot". The third Confusion feature DIFFERENTIATION IN CONTEXT is irrelevant because the referent is probably absent from the situational context altogether. Finally, the Search-space features are [-INANIMACY] and [+THIRD PERSON]. In summary, in (20b) we have a referent of a null subject with five negatively specified informativeness features, two positively specified features, and one irrelevant feature:[+ABSENCE], [-NEWNESS], [-QUERY], [-CONTRAST], [-DIFFERENTIATION IN DISCOURSE], [-INANIMACY], [+THIRD PERSON].

As for the examples from Thrasher (1977), repeated here as (21), we would like to note that they all need some context to determine the referent of the null subject. However, since it does not take much effort to make up such a context or situation in one's mind quickly, the null subjects in these sentences are quite acceptable. Once such contexts are

created, the informativeness features can be applied in much the same way as to the null subjects in the sentences in (19) and (20).

(21)
a. *ec* really appreciate the help.
b. *ec* perjured himself again last night.
c. *ec* shouldn't leave that purse unattended.
d. *ec* thought I heard something.
e. When you get a minute, *ec* like to have a word with you.
f. This time next month, *ec* won't be able to buy beef at any price.
(Thrasher, 1977)

The upshot of the exercise of applying the informativeness features to referents of English null subjects is that it shows that not all, but a certain number of features need to be specified negatively in order to meet the pragmatic requirements for subject drop. The question is whether there is a threshold, and if yes, what that threshold is. So far, we have seen that with five out of eight informativeness features specified negatively a subject can still be null (20b). The threshold might vary from speaker to speaker, and from situation to situation. However, as a rule of thumb, it seems plausible to assume that more than half of the informativeness features need to have the value – to allow for subject drop. Fewer negatively specified informativeness features might lead to difficulty in identifying the referent and therefore to confusion or communication breakdown.

Concluding, English subject drop exists, given the right syntactic and pragmatic environments. It is constrained by syntactic factors such as the ones exemplified in (11) and (12), namely, a null subject cannot appear after a preposed constituent, or in an embedded clause. Provided that the syntactic requirements are met, subject drop in English is driven by pragmatic features of informativeness, which enable the referent to be identified in the context.

As we mentioned before, and in anticipation of the discussion of null subjects in TD and SLI child language we would like to emphasize that the application of informativeness features only makes sense if the speaker takes the hearer assumptions into account. The speaker needs to take the hearer's point of view into account in order to decide if an informativeness feature should receive a positive or a negative value. For example, to determine whether the feature DIFFERENTIATION IN DISCOURSE is + or – the speaker has to consider whether the hearer is able to choose an entity from the set of potential referents in the five preceding utterances. If there are two or more potential

referents, this feature gets specified positively, even if the speaker her/himself is sure about the referent. If the values of the informativeness features were only up to the speaker, they would all be negative, since supposedly, the speaker always knows the referent of a (null) argument s/he produces. It follows then that a necessary condition for the application of the informativeness features is the pragmatic Concept of Non-Shared Assumptions (CNSA), namely that in principle speaker and hearer assumptions are independent. If speaker and hearer assumptions are not distinguished, the speaker assumptions are automatically attributed to the hearer, implying that the speaker does not need to take the hearer's point of view to calculate whether a null argument's referent is uninformative enough or not.

Concluding, besides grammatical properties adult English subjects also display pragmatic properties: uninformative subject arguments may be omitted (pragmatic Principle of Informativeness) provided that the syntactic requirements for diary-drop are fulfilled.

The next section discusses some of the grammatical subject properties in TD English child language, namely subject-verb agreement and Nominative case. After that the properties of null subjects in TD English child language are examined, in particular the pragmatic properties.

4. SUBJECTS IN TD STANDARD CHILD ENGLISH

4.1. *Grammatical properties: Subject-verb agreement and Nominative case in TD standard child English*

Roger Brown (1973) was one of the first child language researchers to document that TD children acquiring standard English often produce uninflected verbs in the 3rd person singular and omit copular and auxiliary forms of the verb *to be*. Initially, this phenomenon in child language was labeled "agreement omission in finite constructions". The findings were confirmed by many other researchers, such as Radford (1986), Hyams (1992), Wexler (1992; 1994). However, Hyams (1992) and Wexler (1992; 1994) re-interpreted these constructions as "non-finite constructions". They claimed that the error did not consist of agreement omission, but rather of the use of non-finite verbs in obligatory contexts for verbal agreement or finiteness.

In their quantitative study of the development of several syntactic phenomena in English-speaking children with SLI and TD children Rice and Wexler (1996a) show that TD English-speaking 3 year olds

produce non-finite verbs in obligatory contexts for verbal agreement 39% of the time. Interestingly, commission errors such as the ones in (22), are hardly ever observed.

(22) @ = *unattested in standard English child language*
a. @I walk**s** to school (every day)
b. @They eat**s** ice-cream (every day)
c. @You **am** funny
d. @He **are** happy

By age 4;0 the non-finiteness errors have completely disappeared.

As for Nominative case on the subject, several researchers of child English have observed that TD standard English speaking children sometimes use a non-Nominative subject pronoun (Rispoli, 1994; Vainikka, 1994; Schuetze, 1997). Wexler et al.'s (1998) quantitative study of 20 children shows that 3-year olds use Accusative or Genitive subject pronouns 15%, and 3;7 year old children 17% of the time. By the age of 4;0 we no longer find any case errors.

The findings regarding verbal agreement or finiteness and non-NOM subject pronouns are summarized in Table 1:

Table 1. Proportions of morphosyntactic errors in TD standard English child language (Rice and Wexler, 1996; Wexler et al., 1998)

age	**verbal agreement errors**	**non-NOM subject pronouns**
3;0	39%	15%
3;7		17%

4.2. *Pragmatic properties: Subject drop in TD standard child English*

Young TD standard-English speaking children up until age 3;0 drop subjects at substantial rates (Bloom, 1970; Brown, 1973; Hyams, 1983; 1986, among many others). Hyams (1992; 1996) analyzed the phenomenon quantitatively, and found percentages of pragmatically non-adultlike subject omission in English child language as presented in Tables 2 and 3:

Table 2. Proportions of (non-adultlike) null subjects for Adam (from Hyams, 1992)

age	**2;7**	**2;8**	**2;9**	**2;10**	**2;11**	**3;0**
	70%	75%	70%	40%	25%	10%

Table 3. Proportions of (non-adultlike) null subjects in sentences with lexical verbs (from Sano & Hyams, 1994; Hyams, 1996, based on Hyams and Wexler, 1993, and Pierce, 1992)

child	**age**	**proportion**
Eve	1;6-2;1	26%
Adam	2;5-3;0	41%
Nina	2;0 2;2	44% 11%

Table 2 shows the proportion of subject drop in Adam per month from age 2;7 - 3;0, which decreases from 70% (2;7) to 10% (3;0). In Table 3 we see proportions of subject drop for Adam from age 2;5-3;0, but now collapsed, and for Eve and Nina.

Interestingly, all null subjects in the TD children's data were sentence-initial. No null subjects were found in WH-questions (see also Roeper & Rohrbacher, 2000, and Bromberg & Wexler, 1995), embedded sentences, or in sentences with preposed elements. This suggests that, however young the children are they adhere to the syntactic requirements for diary drop in English.

The relatively large proportions of non-adultlike subject drop in TD child English might then lead us to the conclusion that young TD children, up until at least the age of 3, lack the pragmatic rules that govern subject drop in English, namely the CNSA and the informativeness features. Although we will ultimately argue that this conclusion is correct, it is too hasty to draw it as this point. A brief review of studies that distinguish child null subjects in finite and non-finite constructions is in place here.

More fine-grained research on null subjects in the child versions of non-*pro*-drop languages suggests that there is a syntactic correlation between the finiteness of the verb, and the overtness of the subject (Weverink, 1989; Sano & Hyams, 1994; Hyams, 1996; Wexler, 1994, among others). This is the same research that has re-interpreted "agreement omission" in English (see section 2.2) as "non-finiteness". Without going into too much detail, the general explanation is that non-finite verbs do not license overt subjects, and therefore the subject is

null, or at least underspecified in clauses without a finite verb. Thus, in these cases it is the configuration of the child's developing syntactic system that renders the subject null. If we are concerned with the pragmatic factors that drive subject omission, subjects that are null because of syntactic reasons should be excluded. Therefore, the focus should be on sentences with clearly finite verbs.

Sano and Hyams (1994) carried out a detailed quantitative study and investigated the overtness of subjects in different types of finite constructions, namely "inflected *be*", "modals", "3rd person singular –*s*", and "past tense –*ed*". They show that constructions with inflected *be* and modals hardly ever contain null subjects. However, if the verb has a 3rd person singular -*s*, or a regular past tense -*ed* inflection, there is a substantial proportion of null subjects. Consider Table 4:

Table 4: Proportions of null subjects with finite verbs ending in -*s* and –*ed* (from Sano and Hyams, 1994)

name of child	**age**	**-s**	**-ed**	**total –s/-ed**
Eve	1;6-2;3	10% (5/50)	23% (9/40)	16% (14/90)
Adam	2;3-3;0	26% (16/62)	57% (13/23)	34% (29/85)
Nina	2;2-2;4		19% (3/16)	

Eve produces null subjects in 10% of her 3rd person singular present tense constructions and in 23% of her regular past tense constructions, which cannot be explained by a syntactic correlation with the form of the verb. Adam's proportions are even higher: 26% in the present tense and 57% in the past. For Nina only regular past tense counts were done, and she dropped subjects in these contexts 19% of the time. Concluding, despite the fact that part of the proportion of null subjects in child English can be explained by syntactic factors, we are still left with a significant number of non-adultlike, non-syntactically explainable null subjects. Again, interestingly, these null subjects all meet the adult syntactic requirements for diary drop, namely, they all appear in sentence initial position.

Following Haegeman (1996b) and Hamann (2002) we assume that subject omission from finite structures in TD child English must be analyzed as diary drop. For adult English diary drop we proposed that

once the syntactic requirements are fulfilled, uninformative arguments may be omitted. Recall also that the determination of the referent's (un)informativeness depends on the point of view of the hearer. In order to take the hearer's assumptions into account the CNSA must be in place and must be applied. We suggest that the pragmatically non-adultlike omission of subject arguments in finite constructions in early TD English is due to the lack of the (application of the) pragmatic CNSA. As long as this concept is absent or fails to apply, children will not systematically distinguish between speaker and hearer assumptions, and often automatically attribute their own assumptions to the hearer. When children attribute their own assumptions to the hearer the application of informativeness features will result in a null subject of which the referent is identifiable by the speaker, i.e. the child, but possibly not by the hearer. When children do distinguish between speaker and hearer assumptions the application of informativeness features will take place adultlike and possibly result in a null subject that is identifiable by both speaker and hearer. In other words, young typically developing English acquiring children overgenerate null subjects: they allow null subjects in a larger number of pragmatic contexts than adults do: not only when the referent is uninformative to the hearer, but also sometimes when it is uninformative only to the speaker. By the age of about 3;6, typically developing English speaking children no longer produce non-adultlike null subjects, indicating that they have acquired the (application of the) pragmatic CNSA.

This proposal is supported by data from studies on null subjects in several child languages. Allen (2000) applied the eight informativeness features to the null arguments of four children acquiring Inuktitut, aged 2;0-3;6. Although she concludes that most informativeness features are relatively good (but not perfect) predictors of the overtness of child arguments, there are some features that are not predictive of null arguments in child Inuktitut. These features include DISCOURSE DIFFERENTIATION, INANIMACY AND QUERY. Serratrice et al. (2004) report that the PERSON feature is not predictive of null subjects in child Italian and child English: null subjects tend to be third person, rather than 1st or 2nd person in both monolingual Italian and monolingual English speaking children and in an English-Italian bilingual child. Furthermore, in a study on null subjects in child Danish Hamann & Plunkett (1998) found no correlation between uninformativeness and null arguments. These results are not surprising if children do not have the CNSA or if they do not apply it: in the cases in which children attribute their own assumptions to the hearer informativeness features such as DISCOURSE DIFFERENTIATION, INANIMACY, QUERY, THIRD PERSON etc. will automatically receive the value - , since they are evaluated only from the point of

view of the speaker, for whom the referent of the argument is uninformative by definition. An adult might have specified the relevant features positively, because s/he applies informativeness features taking the hearer's assumptions into account. Thus, the lack of the (application of the) CNSA causes a non-target-like application of the Principle of Informativeness, resulting in non-target-like null subjects. A study on null subjects in English child language by Matushansky and Wexler (2002) provides corroborating evidence too: they report that with the development of age for 3rd person singular null subjects there is a significant increase of the number of antecedents. Matushansky and Wexler speculate that young children often seem to assume that listeners know more about the referent of a (null) pronoun than the discourse actually warrants, or, in other words, what children assume to be shared knowledge does not necessarily have a linguistic expression in the prior discourse. This speculation is in line with (and made precise by) our proposal that young children lack the CNSA. Matushansky and Wexler further note that the fact "that young children are not very precise on what is shared knowledge in a discourse is reflected in the fact that they use definite DPs and pronouns when the situation does not provide a unique referent (Avrutin and Wexler, 1992; Kail and Hickman, 1992; Karmiloff-Smith, 1981; Maratsos, 1976; Thornton and Wexler, 1999). The effect diminishes as the child grows up."

To sum up, we have shown that subjects in adult English have both grammatical and pragmatic properties. The syntactic properties subject-verb agreement and subject case are assumed to be part of grammar, while the omission of subjects in adult English is argued to be driven by pragmatic factors such as informative features (Allen, 2000), which can be applied appropriately only if the CNSA is present and active. If this is not the case, i.e. if no distinction is made between the speaker and the hearer assumptions, the speaker will attribute his/her own assumptions to the hearer, resulting in an automatic negative specification of informativeness features such as DISCOURSE DIFFERENTIATION, INANIMACY, QUERY, THIRD PERSON etc., yielding more pragmatic contexts for null subjects. We argue that this is exactly what happens in TD child English. Simultaneous with the appearance of non-adultlike null subjects errors regarding subject-verb agreement and subject case occur. Although it is tempting to look for one analysis that would explain both phenomena, we maintain that each phenomenon has its own explanation, within its own language component: subject-verb agreement and subject case errors have their underpinnings within the grammar, while subject-drop errors are due to missing properties of the pragmatic system. In section 7 we will show that this claim is warranted by data from English speaking children with SLI.

5. HYPOTHESES AND PREDICTIONS

As discussed in sections 3 and 4 subjects have pragmatic and grammatical properties. Therefore, they provide an excellent test-ground for the modularity of language. Recall from section 2 that the crucial pragmatic concept under investigation regarding these phenomena is the Concept of Non-Shared Assumptions (CNSA), which is likely to be part of non-linguistic pragmatics, and applied to linguistic structures by interface pragmatics. We have seen that typically developing 2-year olds and to a lesser extent some 3-year olds do not consistently apply the CNSA, resulting in the omission of subjects. At the same time, they do not perform well on the grammatical properties either: subject-verb agreement or finiteness is often lacking, and Nominative case errors occur. The pragmatic shortcomings are explained by the lack of the (application of the) CNSA, the grammatical errors by deficiencies or immaturities in the underlying grammatical mechanisms. Although such a division of labor between grammar and pragmatics is conceptually attractive in the description and explanation of child language, it is not always easy to prove this dissociation empirically. If TD 2-year olds make errors with respect to both the pragmatic and the grammatical properties of subjects, why couldn't all these errors stem from one and the same source? The idea that grammar and pragmatics are two distinct components of language (cf. the modularity hypothesis) can be empirically defended if we find a population in which one set of properties is intact, and the other one deficient. We hypothesize that children with SLI constitute such a population.

In section 2 we showed that most studies on pragmatic abilities in children with SLI concentrate on linguistic pragmatic skills such as speech acts, conversational participation and discourse regulation, code switching, etc. These studies do not provide a clear picture as to whether children with SLI are impaired in linguistic pragmatics or not. However, the small number of studies that address interface and/or non-linguistic pragmatic skills suggest that children with SLI may not be impaired in these particular areas of pragmatics. One study that examines pragmatic impairments in children with SLI that do not involve speech acts, conversational participation, politeness, style, registry, etc. is Skarakis and Greenfield (1982). Inspired by Snyder (1975; 1978) Skarakis and Greenfield investigate the marking of new and old information in the verbal expression of language-disordered children acquiring English beyond the one-word stage. The results show that language-disordered children selectively mark new information in verbal communication, just as TD children do.

Language-disordered and TD children, furthermore, manifest the same developmental sequence of strategies for deemphasizing old information – children at an MLU level of 3 tend to omit it, whereas children at an MLU level of 5 tend to pronominalize it. In our terminology, this study examines the production of (non-)referential nominal expressions and presupposition, i.e. interface pragmatics. Parallel to our discussions in chapters 4, 5 and 6 we argue that it is the initial lack, and subsequent acquisition of the (application of the) CNSA that explains this course of development. The study by Skarakis and Greenfield suggests that there is at least a subgroup of children with SLI whose relevant interface pragmatic principles (the application of the CNSA) and non-linguistic pragmatic principles (the CNSA itself) are not impaired.

Building on these observations we formulate two main hypotheses, as listed in (23):

(23) *Hypotheses*

Hypothesis 1:	Interface pragmatics and non-linguistic pragmatics are dissociated from grammar (syntax/semantics).
Hypothesis 2:	Children with SLI have deficits in their grammar, but not in their interface pragmatics and/or non-linguistic pragmatics.

These hypotheses render several predictions with respect to the linguistic behavior of subjects. Recall that for TD children we claim that they acquire the CNSA around the age of 3, some children perhaps a little later.

First, we predict that children with SLI older than 3 have the non-linguistic pragmatic CNSA, and the interface pragmatic mechanisms that take care of the application of the CNSA, just like their typically developing age mates. From this it follows that English acquiring children with SLI older than 3 should not overgenerate null subjects. Second, we predict that children with SLI may have problems with the grammatical properties of subjects. In particular, English acquiring children with SLI are predicted to produce errors with respect to subject-verb agreement and Nominative Case. The predictions are listed in (24):

(24) *Predictions*

I. *Children with SLI older than 3 have the non-linguistic pragmatic Concept of Non-Shared Assumptions and the interface pragmatic mechanisms that take care of the application of the CNSA:*

(i) English acquiring children with SLI older than 3 do not overgenerate null subjects.

II. *Children with SLI have deficits in their grammar:*

(ii) English acquiring children with SLI (younger or older than 3) make errors with respect to subject-verb agreement and Nominative Case.

The predictions listed in (24) are tested by analyzing the spontaneous speech of a group of English speaking children with SLI between the ages of 3;11 and 4;10. After we present our methodology in section 6, we will present and discuss the results in section 7.

6. METHODS

6.1. *Participants*

We examined the spontaneous speech transcripts of 14 English-speaking children with SLI between the ages of 3;11 and 4;10 (mean age 4;4) and an MLUm (Mean Length of Utterance in morphemes) range of 2.0-5.0 (mean MLUm 3.8) and two individually matched control groups (MLU and age) of 14 children each. These data are part of the "San Diego Longitudinal Study" (Tallal, Curtiss and Kaplan, 1988) and were kindly made available to us by Susan Curtiss. In the original study children from San Diego with SLI were followed for 5 consecutive years, referred to as year 1, year 2, year 3, year 4, and year 5, respectively. The children in year 1 were roughly 4 years old, the year 2 children 5, the year 3 children 6, the year 4 children 7, and the year 5 children 8 years old. For the current study we only used the data of the youngest (4-year old) children, i.e. the children of 'year 1'.[6] Nearly all 4-year olds attended special preschools for children with

[6] The rationale behind this is as follows: children with SLI are usually about 1 year (sometimes a little more) behind their TD peers in terms of language development. Since the TD children studied in previous research on subject and article realization are usually about 2 – 3 years old, and we are comparing our findings with those data, our study does not call for the analysis of the data of the older (5, 6 and 7 year old) children with SLI.

language delays and disorders, but most of them went on to regular elementary schools. Details regarding the individual subjects' sex, age and MLUm are provided in Tables 5 and 6.

Table 5. English speaking children with SLI (N=14) and their MLUm controls (N=14)
(San Diego Longitudinal Study - Tallal, Curtiss and Kaplan, 1988)

SLI				**MLUm-CONTROLS**			
ID	**Sex**	**MLUm**	**Age**	**ID**	**Sex**	**MLUm**	**Age**
82	M	2.018	3.11	**308**	F	3.000	3.01
130	M	2.317	4.02	**318**	F	3.018	2.11
100	M	2.382	4.08	**324**	M	3.218	3.04
191	F	3.164	4.02	**306**	M	3.431	3.00
177	M	3.176	4.02	**333**	M	3.458	2.10
188	M	3.859	4.04	**320**	F	3.729	2.11
94	M	4.034	4.09	**301**	F	3.868	2.09
149	M	4.115	4.05	**319**	F	3.904	2.11
192	M	4.143	4.07	**316**	F	3.968	3.00
99	M	4.721	?4?	**304**	M	4.000	3.06
146	F	4.759	4.09	**322**	M	4.160	3.07
68	M	4.883	4.02	**321**	F	4.451	3.0
133	F	4.940	4.05	**311**	M	4.785	2.11
80	F	5.068	4.10	**305**	F	4.798	2.11
Average		**3.827**	**4;04 years**	**Average**		**3.842**	**3;0**

Table 6: *English speaking children with SLI (N=14) and their age controls (N=14)*

SLI				AGE-CONTROLS			
ID	**Sex**	**MLUm**	**Age**	**ID**	**Sex**	**MLUm**	**Age**
82	M	2.018	3.11	**301**	F	6.078	3.11
99	M	4.721	?4?	**311**	M	4.931	4.00
130	M	2.317	4.02	**325**	F	6.209	4.00
191	F	3.164	4.02	**305**	F	6.170	4.01
177	M	3.176	4.02	**306**	M	4.545	4.01
68	M	4.883	4.02	**308**	F	5.147	4.01
188	M	3.859	4.04	**335**	F	10.093	4.02
149	M	4.115	4.05	**304**	M	4.980	4.06
133	F	4.940	4.05	**319**	F	7.093	4.07
192	M	4.143	4.07	**320**	F	6.472	4.07
100	M	2.382	4.08	**321**	F	10.470	4.07
94	M	4.034	4.09	**322**	M	5.650	4.07
146	F	4.759	4.09	**324**	M	5.856	4.07
80	F	5.068	4.10	**318**	F	3.953	4.08
Average		**3.827**	**4;04 years**	**Average**		**6.320**	**4;03 years**

Tallal, Curtiss and Kaplan (1988) report that the participants with SLI were children with a specific language disability, but without other primary sensory, motor, cognitive, emotional or neurological impairments. In order to be included as a participant in this group, a child had to meet each of the criteria in (25):

(25) *Criteria English-speaking children with SLI*

(i) A non-verbal performance IQ of 85 or better on the Leiter International Performance Scale (Leiter, 1940);
(ii) a mean language age (when computed from expressive and receptive test scores, see below) at least one year below both performance mental age and chronological age;
(iii) normal hearing acuity, no motor handicaps, no oral structural or motor impairments affecting nonspeech movements of the articulators;
(iv) an English language background without significant dialectal or language differences in the home environment;
(v) language skills equal to or greater than those expected at one year of normal development;
(vi) no obvious signs of infantile autism or emotional difficulties (according to DSM-III[7] criteria); and
(vii) no known neurological disorders (i.e., seizures, hemiplegia, etc.).

As can be observed in this list, the only inclusionary criterion is (ii), namely, scores on language tests that indicate a language age at least one year below both performance mental age and chronological age. The relevant language tests consisted of both production and comprehension assessments and included the Sequenced Inventory of Communicative Development (SICD) (Hedrick, Prather and Tobin, 1979); the Token Test (DeRenzi and Vignolo, 1962); the Northwestern Syntax Screening Test (NSST) (Lee, 1971); the Carrow Elicited Language Inventory (CELI) (Carrow, 1974) and an analysis of a spontaneous speech sample. Both normal groups were given the same standardized tests and language sample analyses to be selected into the study.

6.2. *Materials*

Spontaneous speech recordings were obtained from all children in the study and took place in a specially set up lab at the university. The English recordings consist of conversations between the child and an investigator, based on a template of fixed questions ("What's your favorite TV program?", "What's your favorite thing to eat for dinner?", "What did you do after you woke up this morning?" etc.). Originally, all recordings were transcribed orthographically by hand soon after the

[7] DSM: The American Psychiatric Association's *Diagnostic and Statistical Manual*

recordings by native speakers. Later they were computerized using the CHILDES format (MacWhinney, 2000).

6.3. *Analysis*

In order to analyze the data we designed a coding system based on the coding conventions provided by CHILDES, so that they would be analyzable by the CLAN system (MacWhinney, 2000).

We coded all clauses containing a verbal element, except for: (i) imperative constructions; (ii) subject relative clauses; (iii) non-finite embedded clauses; (iv) elliptical clauses; (v) second conjunct in sentential coordinations. The rationale behind excluding these constructions consists of the fact that all these constructions require a null subject in adult English. Therefore, they do not provide a test ground for the question whether English speaking children with SLI use overt subjects in obligatory environments. In addition, they could not tell us anything about subject-verb agreement or NOM Case. In order to analyze subject-verb agreement we included all utterances containing: (i) 3rd person singular main verbs; (ii) 3rd person singular auxiliary verbs *DO* and *HAVE* and (iii) copular and auxiliary forms of *BE* for all persons. For the analysis of subject Case we included all utterances containing a combination of a verb and a subject pronoun displaying overt (NOM/ACC/GEN) Case.

In all transcripts repetitions, completions of adult utterances, songs, poems, or any other rote-learned expressions were excluded from analysis as they do no necessarily reflect the child's grammar in use. The actual analysis of the coded data was executed by performing FREQ and KWAL searches, provided by the CLAN program (MacWhinney, 2000).

7. RESULTS AND DISCUSSION

7.1. *Subject drop*

Let us first examine the pragmatic property of subjects in English, namely the overtness of subjects. In section 3 we argued that English subjects must be overt, unless they occur in special pragmatic contexts. The special conditions under which English subjects can be phonetically null are regulated by informativeness features (Allen, 2000), which, in turn, depend on the Concept of Non-Shared Assumptions (CNSA).

In order to make our subject drop results for the children with SLI comparable to Sano and Hyams' (1994) results for TD English child language, we examined only finite constructions. We subcategorized

the finite verbs into three groups: a) 3rd person singular finite verbs ending in *–s* plus regular past tense finite verbs ending in *–ed*, b) irregular past tense verbs (including past tense forms of *to be*) and, c) present tense forms of *to be* plus modals, which are inherently finite. The results for these categories are presented in Table 7:

Table 7. Proportions of overt and adultlike/non-adultlike null subjects

	SLI (age 4;04, MLU 3.827)			**MLU CONTROLS (age 3;0, MLU 3.842)**		
	-s* + *-ed	**irreg. past (+was/were)**	***be* (present) + modals**	***-s* + *-ed***	**irreg. past (+was/were)**	***be* (present) + modals**
overt subjects	93% (55/59)	96% (48/50)	95% (42/44)	88% (58/66)	91% (81/89)	95% (41/43)
adultlike null subjects	5% (3/59)	0% (0/50)	0% (0/44)	4.5% (3/66)	2% (2/89)	0% (0/43)
non-adult-like null subjects	**2%** (1/59)	**4%** (2/50)	**5%** (2/44)	**7.5%** (5/66)	**7%** (6/89)	**5%** (2/43)

	AGE CONTROLS (age 4;03, MLU 6.320)			**YOUNGER TD CHILDREN**		
	-s* + *-ed	**irreg. past (+was/were)**	***be* (present) + modals**	***-s* + *-ed***	**irreg. past (+was/were)**	***be* (present) + modals**
overt subjects	94% (158/168)	97% (208/214)	97% (91/94)			
adultlike null subjects	4% (6/168)	0.5% (1/214)	0% (0/94)			
non-adultlike null subjects	**2%** (4/168)	**2.5%** (5/214)	**3%** (3/94)	***-s* + *-ed*:** Eve (1;6-2;3): **16%** (14/90) Adam (2;3-3;0): **34%** (29/85) ***-ed*:** Nina (2;2-2;4): **19%** (3/16) (Sano & Hyams'94)		***be*:** Eve: **0%** (0/149) Adam: **7%** (13/186) Nina (1;11-2;4): **3%** (2/69) **modals:** (2;0-2;7 MLU: 1.77-4.22) **6-1%** (Valian'91)

As the first four colums show, the English speaking children with SLI hardly ever drop subjects in a non-adultlike fashion: only around 4%. To be precise, they produce 2% non-adultlike subjects with verbs ending in *–s* and *–ed*; 4% with irregular past verbs, and 5% with inflected forms of *be* and modals. In columns 6-9 we see that the MLU controls, whose average age is 3;0 show similar, although slightly higher patterns of non-adultlike null subjects: 8% for *–s* and *–ed*; 7% for irregular past, and 5% for inflected forms of *be* and modals. We attribute the low rates of subject drop of the MLU controls to their age: they are too old to drop subjects, i.e. they have already acquired the CNSA. This claim is strengthened by the fact that TD children studied by Sano & Hyams (1994) and by Valian (1991), who are all younger than 3;0, show significantly higher proportions of non-adultlike null subjects, ranging from 16% to 34%. Finally, the age controls are similar to the children with SLI in that they hardly drop any subjects in a non-adultlike manner in finite constructions.

Thus, our results confirm Prediction (i), that English acquiring children with SLI older than 3 do not overgenerate null subjects. This in turn provides evidence for the more general prediction that English acquiring children with SLI older than 3 have the CNSA. Just like their age-mates they are capable of applying the informativeness features in an adultlike manner, because they realize that the hearer's beliefs are always independent of the speaker's beliefs. This supports the hypothesis that the development of their non-linguistic and interface pragmatics is normal.

On the other hand, the children with SLI do not perform so well on grammatical subject properties such as subject-verb agreement / finiteness and subject Case, as is demonstrated by the numbers in Tables 8 and 9:

Table 8. Proportions of errors in subject-verb agreement / finiteness

	SLI	**N-MLU**	**N-AGE**
main verbs (bare stems)	45% (34/75)	30% (18/63)	10% (16/158)
copulas	27% (22/83)	11% (7/62)	1% (3/268)
auxiliaries	28% (13/47)	32% (13/41)	4% (4/110)
modals	40% (4/10)	(0/0) -	18% (2/11)
TOTAL	**34% (73/215)**	**23% (38/166)**	**5% (25/547)**

At the bottom of the second column of Table 17 we see that the children with SLI produce 34% errors with respect to subject-verb agreement, or finiteness. The bottom cell of the penultimate column shows that this error percentage is comparable to that of the MLU controls (23%), but radically different from that of the age controls (5%). Most of these errors are omission errors, i.e. omission of the 3rd person singular *–s* on main verbs or modals, or omission of the copula or the auxiliary.[8] In (26) – (28) we provide some sample errors from the English SLI transcripts:

(26) Omission of 3rd person singular *–s*:

Child # 146, age 4;9, MLU 4.8
*AMB: and when her is done # then her **clean** the [//] and her **sweep** that.
%num: 40
%syn: and when her AUXF|is-3sg done then her VF|clean-=0/s and her VF|sweep-=0/s that
*EXP: good.

Child # 82, age 3;11, MLU 2.0
*EXP: did mommy make a birthday cake for you?
*STA: he **like** me cake.
%num: 42
%syn: he VF|like-=0/s me cake

[8] In addition to *can*, *must*, *may*, etc. verbs such as *want*, *have to* were coded as modals.

Child # 68, age 4;2, MLU 4.9
*EXP: he tries to tell jokes.
*DER: he **try** to do jokes.
%num: 10
%syn: he VF|try-=0/s to do jokes

Child # 149, age 4;5, MLU 4.1
*GAR: want [/] want cookie mon [//] him **want** eat cookies.
%num: 17
%syn: him MODF|want-=0/s eat cookies
*EXP: uh huh.

(27) Omission of copula (indicated by __)

Child # 82, age 3;11, MLU 2.0
*STA: I __ charlie brown.
%num: 3
%syn: I COPF|=0/am charlie brown
*EXP: are you charlie brown or are you stanley brown?
*STA: charlie brown.
%num: 4

(28) Omission of auxiliary (indicated by __)

Child # 192, age 4;7, MLU 4.1
*JAS: cookie monster # uh # __ eating cookie.
%num: 24
%syn: cookie monster AUXF|=0/is eating cookie

The finding that English acquiring children with SLI make many errors with respect to subject-verb agreement / finiteness is corroborated by the results of several other studies on English SLI (Leonard, 1989; Leonard et al. 1992; Rice and Oetting, 1993, Rice and Wexler, 1996a). To review one study, Rice and Wexler (1996a) obtained two separate samplings from 37 preschool children with SLI, with a mean age of 4;10 (range 4;4 – 5;7). One sampling concerns spontaneous speech, the other consists of probed data. The focus of their investigation are Tense markers such as *-ed*, *-s*, *be* and *do*. In the spontaneous speech sampling they found 64% omission errors regarding *-s*; and 43% omission errors regarding *be* (there were no data regarding *do* in the spontaneous speech sampling). As for the probe sampling, the children with SLI made 77% omission errors with respect to *-s*; 50% with respect to *be*, and 71% with respect to *do*. Note that

these error percentages are even higher than the ones we report in the current study.

Let us now turn to the results on the second grammatical property of subjects, namely subject case. Table 9 shows that the children with SLI produce 13% non-Nominative case on subject pronouns, as opposed to both their MLU- and their age-matched controls who virtually never produce subject case errors.

Table 9. Proportions of non-Nominative case on subject pronouns

	SLI	**N-MLU**	**N-AGE**	**younger TD children**
non-nominative case	13% (29/216)	3% (7/253)	0% (2/824)	9% - age 1;0-3;0 (N=12) (Rispoli, 1994) 22% - age 2;0-2;6 (Nina) (Schuetze, 1997)

Sample errors from the SLI transcripts are provided in (29) – (35):

(29) *Child # 146, age 4;9, MLU 4.8*
*AMB: and when **her** is done # then **her** clean the [//] and **her** sweep that.
%num: 40
%syn: and when SP|=her/she AUXF|is done then SP|=her/she VF|clean-=0/s and SP|=her/she VF|sweep-=0/s that
*EXP: good.

(30) *Child # 149, age 4;5, 4.1*
*EXP: who's cookie monster?
*GAR: **him** eat cookies.
%num: 16
%syn: SP|=him/he VF|eat-=0/s cookies

(31) *Child # 133, age 4;5, MLU 4.9*
*EXP: what did she do?
*REG: she do [//] she puts some little bit of cereal in there and then **her** mixes it up with water.
%num: 16
%syn: SP|she-n VF|puts-3sg some little bit of cereal in there and then SP|=her/she VF|mixes-3sg it up with water

(32) *Child # 192, age 4;7, MLU 4.1*
*JAS: when it's all gone # then the cookie monster get mean.
%num: 25
*JAS: and **him** bounces santa clause up and down # up and down # up and down # up and down # up and down # up and down # up and down and up an down.
%num: 26
%syn: and SP|=him/he VF|bounces santa claus up and down
*EXP: okay.

(33) *Child # 149, age 4;5, 4.1*
*EXP: why does he like boys?
*GAR: because him [/] because **him** nice.
%num: 10
%syn: because SP|=him/he COP|=0/is nice

(34) *Child # 149, age 4;5, 4.1*
*EXP: you can take those little guys off if you want to.
*GAR: I don't want that [//] them off.
%num: 4
%syn: SP|I-n AUXB|don't want them off
*GAR: **them** no good two.
%num: 5
%syn: SP|=them/they COP|=0/are no good two
%com: It is not clear whether GAR means too or two.

(35) *Child # 82, age 3;11, MLU 2.0*
*STA: **him** coming out.
%num: 7
%syn: SP|=him/I AUX|=0/is coming out
*EXP: it goes up to the microphone.
*STA: wow.

Other studies on subject Case in children with SLI show even higher error percentages. For example, Wexler, Schuetze and Rice (1998) report that a group of English speaking children with SLI with a mean age of 4;9 produced 43% non-Nominative 3rd person singular subject pronouns in spontaneous speech samples. At the age of 5;5 this percentage had decreased to 23%. Wexler, Schuetze and Rice's probe data display a similar pattern: 44% non-Nominative 3rd person singular subject pronouns when the group had a mean age of 4;9, and 41% at the age of 5;5.

Notice that our MLU controls perform much better than the children with SLI on subject Case. This is not surprising if we take the age of the MLU controls into consideration: most of them are older than 3, which is the age that non-NOM Case errors usually disappear. As is indicated in the last column of Table 18, studies on subject Case in young, typically developing, English acquiring children (for example, Rispoli, 1994, Vainikka, 1994; Schuetze, 1997; Wexler, Schuetze and Rice, 1998) report higher percentages of non-Nominative Case on subject pronouns in the language of children younger than 3. Rispoli (1994) finds 9% non-Nominative subjects in the 12 typically developing children between age 1;0-3;0 that he studied. Furthermore, Schuetze (1997) shows that Nina, a typically developing English-acquiring child, produces 22% non-Nominative 1st and 3rd person singular subjects between the ages of 2;0 and 2;6.

More importantly, the fact that the children with SLI whom we studied show substantial error rates with regard to both subject-verb agreement and subject Case confirm prediction (iv), namely that English acquiring children with SLI (younger or older than 3) make errors with respect to subject-verb agreement and Nominative case. This provides evidence for the more general prediction (II) that children with SLI have deficits in their grammar. Putting this together with the earlier finding that the English speaking children with SLI perform adultlike with respect to subject drop we observe an interesting dissociation between the pragmatic and the grammatical properties of subjects in the language development of these children: the pragmatic properties develop typically, while the development of the grammatical properties lag behind. This is in sharp contrast with TD children, whose language displays non-adultlike subject drop, errors with respect to subject-verb agreement / finiteness and Nominative Case during the same stage, namely before age 3. Around age 3 all these errors disappear simultaneously. The cooccurrence and simultaneous disappearance of these errors in TD child language is misleading in the sense that it could lead us to assume a causal relationship between all of them or one common source. Our research on SLI has shown that this assumption is wrong: if there were one common source to subject drop, subject-verb agreement / finiteness errors and Nominative case errors, all errors would either persist in the language of children with SLI or they would disappear at the same time, neither of which is the case.

8. CONCLUSION

The study described in this paper is a first step towards the verification of the hypotheses posited in section 5. First of all, we have provided support for the linguistic-theoretical hypothesis that grammar and

pragmatics are two distinct components of language, each with their own principles and concepts. Our examination of subjects shows that certain subject properties are driven by grammatical mechanisms, while others arise from the application of pragmatic concepts. The language of children with SLI shows clearly that each component develops at its own pace: the non-linguistic pragmatic Concept of Non-Shared Assumptions (CNSA) and its interface pragmatic application driving correct subject realization develop normally, as in TD child language, around age 3. Yet, the grammatical principles underlying correct subject-verb agreement / finiteness and subject case show a developmental delay, and are still not mastered at the age of 4.

Second, our findings contribute to the linguistic profile of children with SLI. They provide evidence for the hypothesis that despite impairments in their grammar, children with SLI have no impairments in their non-linguistic and interface pragmatic systems. In terms of diagnostic criteria for SLI our results show that for English, subject-verb agreement omission errors and non-Nominative case on subjects should be considered as inclusionary criteria. In contrast, our results suggest that pragmatic factors such as adultlike subject overtness represent exclusionary criteria for SLI. Furthermore, knowing the relevant intactness of pragmatics influences the development of intervention programs. If non-linguistic and interface pragmatics are intact, treatment of SLI could focus on using it compensatorily to circumvent grammatical impairments.

Third, we have shown that the study of SLI can shed light on issues that are not readily unraveled by data from TD child language alone. TD children younger than 3 perform non-adultlike on all properties of subjects, namely, subject realization *and* subject-verb agreement /finiteness and subject case. As we mentioned before, this empirical observation may lead us to falsely assume a common source for these errors. The study of SLI provides direct empirical evidence in favor of the dissociation between grammar and pragmatics, i.e. of a grammatical source for subject-verb agreement and subject case errors, and of a pragmatic account of subject drop.

To summarize then, our findings contribute to (i) linguistic theory, (ii) the profile of SLI, and (iii) language acquisition theory.

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