

Functional Categories across Child Populations

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1. Introduction

In this paper I discuss the nature of functional categories by addressing questions such as “How purely grammatical are functional categories?” and “Do functional categories ever interact with other language components?”. In terms of language models employed in generative linguistics this translates into “How modular are functional categories?”. The investigation of instantiations of functional categories in the language production of various child populations suggests that most functional categories are not as purely grammatical and modular as they are traditionally made out to be.

The traditional functional categories I(nflection), C(omplementizer) and D(eterminer) have received much attention from syntacticians and acquisitionists alike and have gone through several name changes and elaborations over the years. For example, the functional projection IP was split up into T(ense)P and Agr(eement)P (later AgrS(subject) and AgrO(bject)) by Pollock (1989), the functional projection CP was separated into ForceP, Fin(iteness)P, Top(ic)P and Foc(us)P by Rizzi (1997), and DP is often assumed to include projections such as AgrP, Num(ber)P and Gen(der)P (Ritter, 1989; Koopman, 1998). The latter two are often assumed to be (sub)projections of IP or AgrP as well, as is Pers(on)P. With the introduction of the Minimalist Program (Chomsky, 1993) IP disappeared as a functional projection in the syntactic tree, and was replaced by TP. The point here is that different theories assume different functional projections, however, their common denominator seems to be their grammatical, non-lexical nature. For the sake of simplicity I refer to the traditional terms IP, CP and DP to start with. Wherever necessary, I digress from this basic terminology and use more detailed terms.

The populations examined include monolingual English speaking children with hemispherectomy, typically developing Hebrew/English bilingual children, monolingual English speaking children with Specific Language Impairment, and typically developing English and Hebrew speaking children (as controls). In the following sections I discuss three studies investigating instantiations of I, D and C in these different child populations.

2. Functional categories in children with hemispherectomy

Curtiss & Schaeffer (2005) investigate I, D and C in the spontaneous speech production of 10 children with hemispherectomy, i.e. children whose entire left or right hemisphere has been removed as a consequence of severe epilepsy. Five children with left hemispherectomy (LH), i.e. children with only a right hemisphere, were matched as closely as possible for etiology, chronological age at surgery, and chronological age at testing with five children with right hemispherectomy (RH), i.e. children with only a left hemisphere. The children’s ages at the time of testing range from 6;6-15;8. For more detailed information about the participants the reader is referred to Curtiss & Schaeffer (2005). Adopting the traditional hypothesis that grammar is located in the left hemisphere these children provide an excellent test ground for the prediction that functional categories, assumed to be core parts of grammar, should be problematic for children with LH.

The following instantiations of I, D and C were coded and analyzed:

(1) *Instantiations of I, D and C coded and analyzed*

- I: AgrS/T: subject pronouns bearing Nominative Case, auxiliaries, copulas, modals, 3rd person singular, regular past, irregular past, infinitival *to*
 AgrO: regular past participle, irregular past participle, progressive
 (Because of the parallel between AgrO and AgrS, and because AgrO often interacts with T and AgrS (progressive constructions appear with inflected *finite* forms of the auxiliary *be* and participles occur with inflected *finite* forms of the auxiliary *have*) we included AgrO in the set of functional morphemes we examined)
- D: articles, possessive determiners (*my*), possessive pronouns (*mine*), possessive 's, demonstrative determiners, demonstrative pronouns, basic quantifier (*some*), cardinality quantifier (*five*), plural morpheme
- C: complementizers (of argument and adjunct clauses), WH-pronouns (of main and embedded questions), relative pronouns.

The predictions regarding these elements are formulated in (2):

(2) *Predictions for children with hemispherectomy*

- (i) Controlling for etiology and age, children who have undergone left-hemispherectomy (LH) will evidence a greater error rate in use of functional category elements compared to their right hemispherectomy (RH) counterparts.
- (ii) Right hemispherectomized (RH) children, those with only a left hemisphere, will develop normal grammars, exhibiting normal developmental patterns with respect to the functional category systems, eventually attaining the adult functional category systems in the target language.
- (iii) Given increasing evidence that early child grammars, normal and abnormal, embody functional categories, even in the course of protracted and impaired linguistic development, left-hemispherectomized (LH) children will, nonetheless, develop grammars which contain the functional categories present in adult English.

Tables 1, 2 and 3 present the results for the I-system, the D-system, and the C-system, respectively:

Table 1: Mean error rates for I-system (AgrS/T + AgrO) by side of removal

	AGRS/T	AGRO
LH	10.2 %	5.8%
RH	3.2%	0%

Table 2: Mean error rates for D-system by side of removal

LH	7.3%
RH	3.1%

Table 3: Mean error rates for C-system by side of removal

LH	2.1%
RH	2.7%

The overall numbers for the LH and RH groups indicate greater error rates for the children who underwent LH. This result provides support for prediction 1: controlling for etiology and age, the children who have undergone LH evidence a greater error rate in use of functional category elements compared to their RH counterparts. As for the RH group, their error rates (3% for both the I- and D-system, and 2% for the C-system) fall well within the limits of acceptable error percentages (noise), and are comparable to the rate of performance errors made by adults. This supports prediction 2: children with RH develop normal grammars, exhibiting normal developmental patterns with respect

to the functional category systems, eventually attaining the adult functional category systems in the target language. Finally, the LH group did not make many errors on grammatical morphemes (2% for the C-system - 11% for the I-system), providing evidence in favor of prediction 3: Even the LH children develop grammars which contain the functional categories present in adult English.

Concentrating on the first finding, and prediction 1, we see that the side of resection has the clearest effect on instantiations of AgrS/T and AgrO: LH children show a greater error rate. The effect on D is less clear, while C shows no effect at all (if anything, an opposite trend!). As Curtiss & Schaeffer note, this higher vulnerability of AgrS/AgrO, as opposed to C, and to a lesser extent D in the LH group lends support to the hypothesis that it is the core of grammar, i.e. syntax proper that is affected if the left hemisphere is removed. While AgrS and AgrO are purely syntactic notions, it is often argued that the functional category C serves as a link between grammar and pragmatics/discourse, thus suggesting that it fulfills more than just a syntactic function (cf. Rizzi, 1997; Hamann, 1996; Hulk & Müller, 2000, among others). Similarly, D is frequently assumed to interact with discourse as well, e.g. when it concerns reference (Hoekstra & Hyams, 1995 and references therein; Schaeffer, 1997; 2000, among others). Based on these findings I tentatively propose that linguistic knowledge associated with the functional categories C and D is not as lateralized as, for example, knowledge of AgrS and AgrO. Taking this one step further, it could be hypothesized that it is the functional category Agr(eement) that belongs to the core of grammar and is processed in the left hemisphere, but not C or D.

3. Functional categories in bilingual children

In their case study of the spontaneous speech of a bilingual Hebrew/English speaking child Hacothen & Schaeffer (2005; to appear) examine one specific instantiation of the functional category I, namely subjects in Hebrew, which, as we will see, have grammatical and pragmatic properties.¹ Addressing the question as to whether there is cross-linguistic influence between the two languages in terms of subjects, they test a hypothesis put forward by Hulk & Müller (2000) which makes exact predictions regarding this issue. Hulk & Müller (2000) argue that the conditions for crosslinguistic influence in bilingual children are as in (3):

- (3) *Hypothesis for cross-linguistic influence in bilingualism* (Hulk & Müller, 2000)
- (i) Involvement of the syntax/pragmatics interface
 - (ii) Surface overlap between the two target languages: Language A influences language B if the surface phenomena of language B include the relevant surface phenomena of language A.

If both conditions are satisfied, it is predicted that the analysis given to the relevant phenomenon in language A is also used for language B by the bilingual child.

One phenomenon that shows surface overlap between Hebrew and English is the realization of subjects. English, being a non-*pro*-drop language, requires subjects to be overt, while Hebrew, a partial *pro*-drop language, allows subjects to be either null or overt when the verb is inflected for 1st/2nd person in past/future. In other parts of the paradigm subjects must be overt. Thus, condition (ii) of Hulk & Müller's (2000) hypothesis is satisfied: the surface phenomena of Hebrew when it concerns subject realization include the surface phenomena of English and therefore cross-linguistic influence is predicted to occur from English to Hebrew.

Regarding condition (i), as has been shown for the *pro*-drop languages Italian and Spanish, the choice of using a lexical subject in *pro*-drop languages relies greatly (and perhaps exclusively) on pragmatic considerations, such as emphasis, contrast, and/or old vs. new information (e.g. Silva-Corvalán, 1994; Davidson, 1996). To date, no one has provided a formal account for Hebrew overt subjects in *pro*-drop context. However, according to native speakers the use of overt subjects in the

¹ According to most theories employing the functional projection IP, subjects are assumed to be situated in, or pass through spec IP.

pro-drop part of the Hebrew paradigm is clearly determined by pragmatic considerations such as emphasis and/or contrast, as the example in (4) illustrates:

- (4) Speaker A: lama Ø lo kanitem et haxulca?
 why no bought-2pl ‘et’ the-shirt
 ‘Why didn’t you (pl) buy the shirt?’
 Speaker B: ani raciti liknot ota aval Orit lo racta
 I wanted-1sg buy-inf her but Orit not wanted-3sgf
 ‘I wanted to buy it but Orit didn’t.’

The example in (4), illustrates the pragmatic considerations involved in the realization of the subject (in this case the 1st person singular, *ani*): speaker B uses the overt subject in order to emphasize the contrast between her and Orit. Thus, condition (i) of Hulk & Müller’s (2000) hypothesis is satisfied as well: subject realization in Hebrew involves the syntax-pragmatics interface.

In contrast, overt subject realization in adult English is a syntactic requirement, rather than a pragmatic one. Subjects are claimed to originate in spec-VP, and are subsequently raised into spec-IP for checking purposes (e.g. Speas, 1986; Rosen, 1990; Burton and Grimshaw, 1992). In principle, the subject argument in English must be realized overtly and although there are certain pragmatic contexts in which null subjects are licensed, for example, diary drop (Haegeman, 1990; 1997), those are highly restricted.

Besides the choice as to whether a subject needs to be overt or can be null, subjects must also agree in phi-features with the verb, a phenomenon that does not seem to involve any pragmatics. While the Hebrew verbal agreement paradigm is rich (encoding of person, number, gender in many verb forms), the English one is relatively poor. Because the agreement systems are so different, we might expect some influence from one language on the other. Yet, if subject-verb agreement is purely grammatical (as also suggested by the hemispherectomy study discussed in section 2), Hulk & Müller’s (2000) hypothesis predicts no influence whatsoever in this domain, because it does not involve the syntax-pragmatics interface, i.e. condition (i) is not satisfied.

The exact predictions with respect to subject realization and subject-verb agreement in the Hebrew of a Hebrew/English bilingual child are thus as in (5):

- (5) (i) A child acquiring Hebrew and English simultaneously produces pragmatically inappropriate overt subjects in Hebrew more frequently than her monolingual Hebrew-acquiring peers (English influences Hebrew)
 (ii) A child acquiring Hebrew and English simultaneously behaves similarly to her monolingual controls with respect to subject-verb agreement, a purely grammatical instantiation of the functional category I/T.

Hacohen & Schaeffer (2005; to appear) test these predictions by analyzing subjects in the Hebrew spontaneous speech samples of one Hebrew/English bilingual girl, EK (longitudinal data) from age 2;10 to 3;4 (MLU: 4.0-4.9), and 5 Hebrew monolingual controls (cross-sectional data from CHILDES (MacWhinney & Snow, 1990). The ages of the control children ranges between 2;4-2;6 (MLU: 3.2-4.8).² EK was raised in Israel in an English-speaking home. She had both English and Hebrew input from birth on. For more detailed information about the participants the reader is referred to Hacohen & Schaeffer (2005; to appear).

The results regarding subject realization are presented in Table 4:

² Note that the control children are slightly younger, which strengthens the results.

Table 4: Proportions of appropriate and inappropriate overt subjects

		EK	monolinguals
NULL SUBJECT		69% (58/84)	76% (41/54)
OVERT SUBJECT	appropriate	8% (7/84)	17% (9/54)
	inappropriate	23% (19/84)	7% (4/54)

As the numbers in the bottom row of Table 4 show, EK produces inappropriate overt subjects more than three times as much as her Hebrew monolingual controls. This provides support for prediction (i), namely that EK produces pragmatically inappropriate overt subjects in Hebrew more frequently than her monolingual Hebrew-acquiring peers. A division of EK's transcripts into three developmental stages reveals that most of these inappropriate subjects appear in the earlier two stages. Table 5 shows that during the later developmental stage (age 3;3/3;4) EK's inappropriate subjects have diminished to 9%, a percentage similar to the average percentage of inappropriate subjects in monolingual Hebrew speaking children aged 2;4-2;6 (7% - see Table 4). Corroborating results are reported by Paradis & Navarro (2003) who show that the Spanish/English bilingual child they investigate produces a higher rate of inappropriate overt subjects in Spanish than his Spanish monolingual peers.

Table 5: EK's inappropriate subject use over time

age	2;10-3;0	3;1-3;2	3;3-3;4
inappropriate overt subjects	32%	27%	9%

In contrast, subject-verb agreement presents no problem for EK: Table 6 shows near-adultlike performance for both EK and her monolingual controls on this measure.

Table 6: Proportions of subject-verb agreement

EK	monolinguals
3% (4/238)	1 % (1/105)

Thus, prediction (ii) is borne out as well: EK behaves similarly to her monolingual controls with respect to subject-verb agreement.

Concluding, in the Hebrew/English bilingual child English influences Hebrew in the syntax-pragmatics interface domain of subject realization but **not** in the purely syntactic domain of subject-verb agreement. This supports Hulk & Müller's (2000) hypothesis as formulated in (3). It also provides independent evidence for the hypothesis formulated at the end of section 2, namely that the functional category Agr(eement) is purely grammatical. This encourages the formulation of the complement of Hulk & Müller's (2000) hypothesis, namely: Purely grammatical elements, such as instantiations of the functional category Agr(eement) are not sensitive to language influence/transfer in bilingualism.

4. Functional categories in children with Specific Language Impairment

The third and last population discussed here consists of children with Specific Language Impairment (henceforth SLI). SLI is considered a disorder that affects language, but no other cognitive function, hence the term: *Specific* Language Impairment. Children with SLI show a significant limitation in language ability, yet, they have no hearing impairments, no neurological damage, and a normal non-verbal IQ of 85 or higher (Bishop, 1997; Leonard, 1998, among many others). 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.

In a set of studies recently conducted Schaeffer and colleagues test the hypotheses in (6) by investigating instantiations of the functional categories I and D in the spontaneous speech of English speaking children with SLI (Schaeffer, Gordishevsky, Hadar & Hacoheh, 2002; Schaeffer, Hacoheh & Bernstein, 2003; Schaeffer, 2005).

- (6) (i) Children with SLI have deficits in their grammar
- (ii) Children with SLI do not have deficits in pragmatics

As noted in section 3, subjects are instantiations of I and have both grammatical and pragmatic properties, thus providing an excellent test ground for the hypotheses in (6). One of the grammatical properties of subjects under investigation is subject-verb agreement, just as in the bilingualism study in section 3. Another one is Nominative Case on the subject. The pragmatic property of subjects being examined is subject-drop in this case, as opposed to subject realization in the bilingualism study, in which Hebrew was the language of investigation. English syntax, being non-*pro*-drop requires subjects to be overt. Yet, in certain pragmatic contexts the subject may be null. For an overview of theories attempting to account for pragmatic subject-drop in English see Haegeman (1990; 1997) (Diary Drop), Greenfield & Smith (1976), Clancy (1993), (1997), (2003) (Principle of Informativeness), and Schaeffer (2005) (Concept of Non-Shared Assumptions).

Similarly, articles are instantiations of the functional category D that display both grammatical and pragmatic properties. As Chierchia (1998) argues, the realization of articles as overt or covert elements is a grammatical process involving the mapping between the semantic property ‘argumenthood’ or ‘predicatehood’ and their syntactic counterparts (noun, or article+noun). On the other hand, the phenomenon of article choice (between a definite and an indefinite article) is pragmatic in nature because it is based on speaker/hearer knowledge (cf. Schaeffer & Matthewson, 2005, among others). Loosely formulated, definite articles denote familiarity of the noun’s referent to both speaker and hearer, while indefinite articles denote unfamiliarity of the noun’s referent at least to the hearer and at most to both speaker and hearer.

Previous studies of TD child language on the phenomena described above show that young TD English speaking children make errors regarding both the grammatical and the pragmatic properties of subjects and articles. Up until the age of maximally 3;6 (but usually a bit younger) TD English speaking children produce (omission) errors with respect to subject-verb agreement (Brown, 1973; Rice & Wexler, 1996a; 1996b, among many others) and Nominative Case on subjects (Rispoli, 1994; Vainikka, 1994; Schütze, 1997), and drop articles (Chierchia et al., 2001). The latter is explained by the misanalysis of predicative nouns such as *cat* as argumental, resulting in non-adultlike bare nouns. In addition, TD English speaking children younger than 3;6 overgenerate null subjects (Hyams, 1983; 1986, 1992, Valian, 1991; Sano & Hyams, 1994) and definite articles (Maratsos, 1974; Schaeffer, 1999; 2000; Schaeffer & Matthewson, 2005).

Returning to our hypotheses for children with SLI, we can now formulate the predictions regarding subjects and articles as in (7) and (8):

- (7) If children with SLI have deficits in their grammar, then
 - (i) English acquiring children with SLI younger and older than 3;6 make errors with respect to subject-verb agreement and Nominative Case, and
 - (ii) English acquiring children with SLI younger and older than 3;6 drop articles.
- (8) If children with SLI have the same pragmatics as their age mates, then
 - (iii) English acquiring children with SLI older than 3;6 do not overgenerate null subjects
 - (iv) English acquiring children with SLI older than 3;6 do not overgenerate definite articles

These predictions were tested on the spontaneous speech transcripts of 14 English speaking children with SLI between the ages of 3;11 and 4;10 (average 4;4), with an MLU ranging from 2.0-5.1 (average 3.8).³ In addition, 14 MLU controls (age range 2;9-3;7; average age 3;0) and 14 age controls

³ Note that the children with SLI are older than 3;6, the crucial age of acquisition for the relevant subject and article properties in TD child language.

took part in the study. For more details about the participants the reader is referred to Schaeffer, Gordishevsky, Hadar & Hacoen (2002); Schaeffer, Hacoen & Bernstein (2003), and Schaeffer (2005).

As for the first grammatical property of subjects, subject-verb agreement, Table 7 shows that the children with SLI produce substantial error percentages, namely 34%. The MLU controls perform slightly better, at 23% errors, and the age controls are adultlike with an error rate of only 5%. These results confirm the first part of prediction (i) that English acquiring children with SLI make errors with respect to subject-verb agreement. Note that no conclusion can be drawn regarding English speaking children younger than age 3;6, because the youngest child with SLI tested is 3;11.

Table 7: Proportion of errors in subject-verb agreement (grammar)

	SLI	TD-MLU	TD-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)

Similar results are obtained for the second grammatical property of subjects, namely Nominative Case, as shown in Table 8. The children with SLI produce non-Nominative subjects 13% of the time, a percentage similar to that of TD children between the ages of 1;0 and 3;0, as shown in the last column. By the age of 3;0 non-Nominative case errors have usually disappeared, which explains the low number of errors made by the MLU controls, most of whom are younger than 3;0. The age controls are fully adultlike. These results provide evidence for the second part of prediction (i): English acquiring children with SLI make errors with respect to Nominative Case.

Table 8: Proportions of non-Nominative Case on subject pronouns (grammar)

	SLI	TD-MLU	TD-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)

Turning now to the pragmatic properties of subjects in English, Table 9 displays the error percentages for subject drop.

Table 9: Proportions of overt and adultlike/non-adultlike null subjects (pragmatics)

	SLI (age 4;04, MLU 3.827)			TD-MLU (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)
adult-like 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)

	TD-AGE (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)			
adult-like 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)	

Interestingly, the same children with SLI who produce many subject-verb agreement errors, hardly ever drop subjects in a non-adultlike way. As we can see, the MLU controls do not drop many subjects either, probably because they are too old. Yet, previous studies report that younger TD English speaking children show significantly higher proportions of non-adultlike null subjects, ranging from 16% to 34% (Sano & Hyams, 1994; Valian, 1991), as is shown by the final columns of Table 8. The adultlike performance on the realization of subjects supports prediction (iii), that English acquiring children with SLI older than 3;6 do not overgenerate null subjects.

Table 10 presents the results on article drop. The children with SLI drop articles 13% of the time, a percentage comparable to the MLU controls and younger TD children from previous studies (Schaeffer, 1999), while the age controls perform adultlike. This result supports prediction (ii), that English acquiring children with SLI drop articles. Thus, children with SLI older than 3;11 seem to

misanalyze predicative nouns such as *cat* as argumental, resulting in non-adultlike bare nouns, suggesting a deficiency in their grammar.

Table 10: Proportions of article drop (grammar)

	SLI	N-MLU	N-AGE	ND 2-year olds
article drop in sentences/phrases	13% (14/105)	8% (14/166)	1% (7/455)	9% (Schaeffer, 1999)

On the other hand, the pragmatic property of articles, namely article choice does not render any problems for children with SLI, as shown by the results in Table 9. None of the children, including the two control groups ever overgenerate the definite article in indefinite contexts. Recall that the MLU controls are around age 3;0, the age at which pragmatic knowledge required for correct article choice has often already been acquired. Yet, younger TD children do overgenerate definite articles, as is indicated in the last column of Table 11.

Table 11: Proportions of *the* overgeneration (pragmatics)

	SLI	N-MLU	N-AGE	ND 2-year olds
<i>the</i> overgeneration in indefinite contexts	0% (0/70)	0% (0/102)	0% (0/271)	16% (14/89) (Schaeffer, 1999)

Summarizing, English speaking children with SLI of age 3;11 and up show substantial error rates regarding Agreement, Nominative Case and article overtness, but NOT with respect to pragmatic phenomena such as subject drop and article choice. This discrepancy in performance between the grammatical and the pragmatic properties of subjects and articles (which is not found in TD children) provides evidence for the hypothesis that children with SLI have deficits in their grammar, but not in their pragmatics. In turn, it supports the theoretical-linguistic hypothesis that grammar and pragmatics constitute two distinct modules (Chomsky, 1986; Fodor, 1983).

Although the results reported above do not make any claims regarding C, there are other studies that suggest that children with SLI perform quite well on this functional category. Wexler, Schaeffer and Bol (2005) report that Dutch children with SLI (age 4;2-8;2) have no problems with V-to-C in spontaneous speech: 99.8% of all finite verbs are in first or second position (V1 or V2). Yet, they do make errors regarding subject-verb agreement. In addition, Novogrodsky & Friedmann (2005) show that Hebrew speaking children with SLI (age 9;3-14;6) never omit the relative pronoun (an instantiation of C) in relative clause production tasks. Yet, they do have problems with thematic role assignment in both relative clause production and comprehension.

Thus, studies on SLI show that Agr(eement) and Nominative Case assignment are impaired, but that (at least some instantiations of) D and C are intact in this population. This again provides support for the hypothesis formulated at the end of section 2, namely that it is the functional category Agr(eement) that belongs to the core of grammar, but not C or D.

5. Discussion

The studies discussed in sections 2, 3 and 4 show that (i) English speaking children with left hemispherectomy make errors mostly regarding instantiations of Agr(eement) and T, but less so regarding instantiations of D and C, (ii) When speaking Hebrew, a Hebrew/English bilingual child produces hardly any errors regarding an instantiation of Agr(eement), namely subject-verb agreement, but she does overgenerate overt subjects, and (iii) English speaking children with SLI make errors with respect to an instantiation of Agr(eement), namely subject-verb agreement, Nominative Case checking, and drop articles (instantiation of D), but they do not overgenerate null subjects or definite determiners (instantiation of D). Furthermore, there is evidence that Hebrew and Dutch speaking children with SLI make very few errors regarding at least some instantiations of C (Novogrodsky & Friedmann, 2005; Wexler, Schaeffer & Bol, 2005).

These results suggest a split between subject-verb agreement, realization of tense morphemes, Nominative Case checking and overt realization of articles on the one hand, and other phenomena, such as subject realization, article choice, V2 and WH/relative pronoun realization on the other hand. The former group represents instantiations of the traditional functional categories I (subject-verb agreement, tense morpheme realization and Nominative Case), and D (article realization). The latter group contains instantiations of I (subject realization), D (article choice) and C (complementizers, WH-pronouns, relative pronouns, and V2). If we make the assumption that the former group represents purely grammatical phenomena, while the phenomena of the latter group involve pragmatics, this split suggests that at least the traditional functional categories I and D have both grammatical and pragmatic properties. As for C, the little evidence discussed in this paper suggests that besides the grammatical properties that it surely has, it interacts with pragmatics as well.

Thus, none of the traditional functional categories I, D and C can be considered purely grammatical and are therefore less modular than originally thought. If anything, it is the functional category Agr(ement) that seems to have only grammatical properties and does not interact with pragmatics. However, note that in recent linguistic theories such as the Minimalist Program, Agreement is no longer a functional category, but merely results from spec-head agreement.

Whether there is a difference between functional categories as to the degree of ‘grammatical-ness’ remains an open question. Curtiss & Schaeffer’s (2005) study on the children with hemispherectomy, and the studies on SLI discussed in section 4 weakly suggest that I/Agr may be more grammatical (and lateralized) than D, which, in turn, may be more grammatical (and lateralized) than C. Studies of more fine-grained functional categories, such as Person, Number, Gender, Tense, Force, Focus, Topic, Finiteness and various D-type categories in different populations may provide an answer to this question.

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