

RUNNING HEAD: VERB ELICITATION IN FRENCH

Elicitation of the passé composé in French pre-schoolers with and without SLI

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Abstract

This study examines inflectional abilities in French-speaking children with Specific Language Impairment (SLI) using a verb elicitation task. Eleven children with SLI and age-matched controls (37 to 52 months) participated in the experiment. We elicited the passé composé using eight regular and eight irregular high frequency verbs matched for age of acquisition. Children with SLI showed dissimilar productive verb inflection abilities to control children (even when comparing participants with similar verb vocabularies and MLUw). Control children showed evidence of overregularization and sensitivity to morphological structure, while no such effects were observed in the SLI group. Error patterns observed in the SLI group demonstrate that, at this age, they cannot produce passé composé forms in elicitation tasks, even though some participants used them spontaneously. Either context by itself might therefore be insufficient to fully evaluate productive linguistic abilities in children with SLI.

Specific Language Impairment (SLI) is characterized by below normal language proficiency in the presence of preserved general cognitive development that cannot be explained as caused by other factors such as autism, neurological impairment or lack of linguistically relevant input (Leonard, 1998). Children with SLI have difficulty producing inflected verbs, among others. While patterns vary across languages and across morphemes within languages, the research consistently reports difficulties with this aspect of acquisition and processing (see below). A number of linguistically motivated theories have been put forward to explain why children with SLI present these inflectional difficulties. Rice and colleagues proposed that children with SLI show an acquisition pattern called the Extended Optional Infinitive (EOI) (Rice, Wexler & Cleave, 1995; Rice & Wexler, 1996; Rice, Noll & Grimm, 1997). According to the EOI hypothesis, children with SLI show protracted development of tense-marking operations, such that they produce them optionally. Young children acquiring English normally go through an optional infinitive stage (OI), where both finite and nonfinite root sentences are used optionally in contexts requiring finite tense marking (Wexler, 1994; 1998) and infinitives or bare stems (kick) are produced instead of appropriately inflected forms (kicked or kicks) in contexts like *He kick the ball. When this pattern is found in older children with SLI, it is interpreted as an extension of the OI period into later ages, at a time when normally developing children have assimilated the obligatory nature of TENSE. Paradis and Crago (2001) adapted this theory to French acquisition data. They propose that SLI be characterized as a stage of extended optional default (EOD). Error types observed in French-speaking children with SLI are the production of verb stems (use of the present in a past or future context) and bare participles (without the auxiliary). Both patterns are found in SLI and language-matched (younger) control children. Paradis and Crago conclude that the production of verb stems (with no overt inflection) and bare participles are the French equivalent of the OI stage in English. An alternative syntactic account of French SLI, proposed by Jakubovicz (2003), explains verb production

difficulties in French children as a processing overload caused by the computational complexity of inflecting verbs for tense, especially when auxiliaries with past participles or infinitives are involved. Gopnik and colleagues proposed an SLI model based on dual-route language processing theories (Gopnik, Dalalakis, Fukuda, Fukuda & Kehayia, 1997; Ullman & Gopnik, 1994). Dual route theories postulate that at least two different processes are involved in language processing, one rule-based and language-dedicated, and the other memory-based and domain-general (Marcus, Pinker, Ullman, Hollander, Rosen & Xu, 1992; Pinker, 1999). According to Gopnik and colleagues, general cognitive processes are not impaired in people with SLI. However, language-specific modules are impaired, more particularly the productive morphosyntactic rules such as tense marking. Thus, people with SLI can learn and memorize words in the same way that young children do, without internal morphological structure (see, for example, Kim, Marcus, Pinker, Hollander & Coppola, 1994; Marcus et al., 1992). Difficulties arise when morphosyntactic rules do not kick in to reduce the associative-based processing load and upgrade it with a rule-based system. Children with language deficits have to learn each and every past tense form for all the verbs they use. An important factor mediating the learning of specific forms is token frequency. The higher the frequency in the child's language, the more likely the production of an appropriate form. (This strategy could backfire, however, as over-reliance on the most frequent forms in a verbal paradigm inevitably leads to variable and erroneous production in the absence of a grammar to verify contextual appropriateness).

Other language processing hypotheses have been proposed to account for SLI. According to the surface account (Leonard, 1998; Leonard, Bortolini, Caselli, McGregor & Sabbadini, 1992; Leonard, Eyer, Bedore & Grela, 1997), the structural properties of the morphemes and their linguistic environments influence the child's ability to process them. In addition, children with SLI are believed to have limited processing capacities. For example, English morphemes are typically found in unstressed positions and

are not syllabic. They are therefore not highlighted in the sound stream. Due to processing limitations (reduced processing speed), less salient morphemes are processed with more difficulty. These difficulties result in weak representations of inflectional morphemes and their omission in the output. However, this account cannot be generalized across different languages and morphemes (Gopnik et al., 1997). Leonard's own research on Italian has shown that children with SLI tend to produce less salient morphemes (cant-a 'sing-3s.f') instead of more salient ones (cant-ano 'sing-3p.f') in spontaneous speech (Leonard et al., 1992). In French, since morphemes are often vocalic (e.g., past participle suffix *-é*), syllabic (usually containing a vowel) and stressed (word final stress falls on the suffix), they should pose no saliency problems during processing. Auxiliaries are separate lexical items that carry word stress. However, they are also monosyllabic and therefore unstressed within the inflectional phrase. French children and adults with SLI show difficulty producing inflected verb forms during elicitation tasks (Jakubovicz, 2003; Rose & Royle, 1999) and in spontaneous speech output (Paradis & Crago, 2001; see however Elin Thordardottir & Namazi, 2007), although spontaneous speech errors are less commonly seen in French than in English. The surface hypothesis is therefore difficult to maintain in light of the cross-linguistic data. More recently, Leonard and colleagues (1998; 2000) proposed that a language's morphological richness can explain cross-linguistic differences in the abilities of children with SLI. If the language has a rich morphology (e.g. Hebrew or Italian), children focus their energies on this aspect, since it is structurally important. If the language has a sparse morphology (English, for example), children focus their energies on other structural aspects, such as word order. However, this explanation does not account for the obligatory versus optional nature of morphological marking across different languages. For example, Hebrew verbs are obligatorily marked for person, number and tense, while English verbs can be bare (stem forms). Children never hear an uninflected form in Hebrew, whereas they do in English. We should therefore expect to observe more stem forms in spontaneous speech

samples of English-speaking children with SLI compared to their Hebrew-speaking counterparts, as these forms are part of the English input and grammatically correct in certain configurations.

Previous research on verb acquisition in French

The research on French acquisition in unimpaired speakers reveals acquisition patterns that differ from those in English. From the outset, unimpaired French-speaking children produce inflected verb forms for person, number and tense. Optional infinitives are quite rare in the spontaneous speech of young children (see Elin Thordardottir, 2005). In early spontaneous speech, French-speaking children produce the present indicative (je roule [jə rul] 'I roll'), the imperative (roule! [rul] 'roll!'), the infinitive (rouler [rule] 'to roll') and bare past participles (without the auxiliary, e.g. *roulé [rule] 'rolled'). This stage is followed by the appearance of auxiliaries and modals in syntactic constructions (e.g., the passé composé, j'ai roulé 'I have rolled', the periphrastic future, je vais rouler 'I will roll', and modal structures je veux manger 'I want to eat') in addition to other syntactically complex structures (e.g., verb + prepositional phrase + infinitive, c'est pour rouler 'it's for rolling'). Only after these stages, usually during the third year, are tense-marking suffixes produced (e.g., imperfect, je roulais 'I rolled') (Grégoire, 1937; Bassano, 1998; Bassano, Maillochon, Klampfer & Dressler, 2001; Legendre, Hagstrom, Vainikka & Todorova, 2002; Kilani-Schoch, 2003; Elin Thordardottir, 2005). Finally, auxiliary and modal-based inflection is the most frequent mode of inflecting the past tense in all modern varieties of spoken French, and remains so throughout all age strata after four years.

French children produce overregularizations of the passé composé, infinitive forms and past participles in spontaneous speech (Grégoire, 1937) and during elicitation tasks (Hiriarteborde, 1972). This occurs when a child inflects an irregular verb form using a regular (-er) or subregular (-ir) pattern (e.g. *il a voulé for il a voulu 'he AUX want-PP' or *il a ouvri for il a ouvert 'he AUX open-PP'.) (See below for a

discussion of conjugation groups.) Children overregularize less frequently in spontaneous early French than in spontaneous early English (Elin Thordardottir, 2005; Royle, 2007).

The passé composé is the first syntactically complex (i.e. auxiliary-based) structure used by French children (Kilani-Schoch, 2003; Elin Thordardottir, 2005). They produce it using a present tense auxiliary form (*j'ai* 'I have' or *je suis* 'I am') in conjunction with the past participle of the main verb (*j'ai bu* 'I drank/have drunk'). As mentioned above, children who have not fully acquired this structure produce the bare past participle without the auxiliary, which is ungrammatical in adult French. The French passé composé is the rough equivalent of the English preterit in terms of meaning (perfective event), timing of acquisition and type frequency in everyday use. By studying this structure, we can uncover cross-linguistic evidence on the acquisition of inflection in emerging grammars. In addition, we can measure the relative effect of verb regularity on linguistic productivity in acquisition patterns in languages other than English. A number of differences exist between English and French verbs. First, most irregular French forms have identifiable suffixes (e.g. buv-ait 'drink-past'), whereas English irregulars are more often portmanteau morphs, with a blurred distinction between stem and affix (e.g. drank = drink-past). Thus, overregularization patterns can be observed either in the stem (i.e. use of inappropriate stem) or the suffix, in French. A second important difference is that the structure of the French passé composé is more syntactically complex than the English past tense. However, this does not seem to pose a problem in terms of acquisition, since French children produce it at early stages of acquisition. Finally, and more importantly, the French verbal system is made up of distinct conjugation patterns.

French verbs are divided into verb conjugation groups. The first conjugation is regular and productive and contains the overwhelming majority of French verbs. All verbs in this class end in -er [e] in the infinitive, with the verbal paradigms preserving a constant stem throughout (see example in 1.a). The second conjugation contains regular verbs ending in -ir [ir] in the infinitive, and can be described as

sub-regular, as it contains forms with constant stems throughout the paradigm, novel forms are occasionally coined into it, and children can overregularize verbs using this pattern (see Royle, 2007 for a discussion of the sub-regular status of this conjugation group). Approximately 300 verbs are found in this class (see example in 1.b-c). A number of French verbs ending in -ir can also be irregular, and thus belong to the third conjugation, which also contains verbs ending in -dre, -re and -oir(e) in the infinitive. Irregular French verbs exhibit stem changes on vowel(s) or consonant(s). Some irregular verbs (auxiliaries, semi-auxiliaries and modals) are suppletive. Examples of irregular verbs are shown in 1.c (-ir irregular), and 1.d (other irregular).

1.	Infinitive	Present 3s	Present 2p	Past participle	
a)	<u>parler</u> [paʁle]	<u>parle</u> [paʁl]	<u>parlez</u> [paʁle]	<u>parlé</u> [paʁle]	'to speak'
b)	<u>finir</u> [finiʁ]	<u>fini</u> [fini]	<u>finissez</u> [finise]	<u>fini</u> [fini]	'to finish'
c)	<u>ouvrir</u> [uvʁiʁ]	<u>ouvre</u> [uvʁ]	<u>ouvrez</u> [uvʁe]	<u>ouvert</u> [uvʁ ɛ]	'to open'
d)	<u>boire</u> [bwaʁ]	<u>boit</u> [bwa]	<u>buvez</u> [byve]	<u>bu</u> [by]	'to drink'

When discussing verb regularity in French, we use the notion of stem consistency throughout the paradigm. As illustrated above, regular -er and sub-regular -ir verbs have a constant stem in all forms. Irregular verbs show stem changes that modify vowels, consonants or both.

Previous research on verb use in French speakers with Specific Language Impairment

Studies on SLI in French-speaking populations are relatively sparse. However, several studies have shown that children with SLI who are learning French present difficulties with inflection, particularly verb inflection (Jakubovicz & Nash, 2001), but also with subject-verb agreement (Franck, Cronel-Ohayon, Chillier, Frauenfelder, Hamann, Rizzi, & Zesiger 2004). Paradis and Crago (2001)

studied the acquisition of tense-marking in spontaneous-speech samples of French-speakers with SLI. They showed that children with SLI used fewer past and future than present tense forms (which are equivalent to stem forms without a suffix, except in the second person plural) compared to control children, but that this difference was less marked in French than English children with SLI. Elin Thordardottir and Namazi (2007) point out that most studies showing verb-morphology deficits in French-speaking children with SLI have focused on school-aged children. They found that inflectional errors are even less prevalent in the spontaneous speech samples of French preschool children with SLI (aged 3;1 to 4;6, mean length of utterance in words (MLUw) = 2;12).

A number of researchers have elicited past tense production in children with and without linguistic impairments to determine which factors play a role in verb processing. In 1994, Kim and colleagues showed that English-speaking children were sensitive to the distinction between regular and irregular verbs, and that this distinction could not be explained solely by phonological structure (Kim et al., 1994). In particular, they showed that children between 3;2 and 5;2 years are sensitive to word-internal structure, and that they overregularize denominal verbs (I flied the board, meaning ‘to cover with flies’) more readily than they use extended meanings of homophonous irregular verbs (he flew/flied down the road, meaning ‘he drove fast’). A possible explanation for this difference is that children are sensitive to the verb’s internal structure (in this case, zero-marked noun-verb derivation). In a study eliciting past tenses in English-speaking children with and without language impairment, van der Lely & Ullman (2001) controlled for both verb conjugation class (regular/irregular) and frequency. Twelve children aged 9;3 to 12;10 with Grammatical SLI participated in the study (van der Lely & Stollwerck, 1996). They were matched with three control groups for morphological production, expressive vocabulary and vocabulary comprehension. Ages ranged between 5;5 and 8;9 in control groups. It was found that children without language impairment responded differently to regular and irregular verbs, showing

frequency effects (more errors and overregularizations) on irregulars only, while they appropriately inflected regular verbs regardless of frequency (except in young children, who showed an inconsistent frequency effect on these items). The authors also found that impaired speakers were not sensitive to verb conjugation class, did not produce overregularizations and were sensitive to verb frequency only. This corroborates previous studies by Ullman and Gopnik (1994) and Clahsen and Almazan (1998), which verified past tense production of real and novel verbs in English-speaking patients with familial language impairment and SLI. Results obtained by Rose and Royle (1999) show that French speakers with familial language impairment aged 8 to 45 had persistent difficulties producing appropriate past and present forms of real and novel verbs in an elicitation task, and showed high sensitivity to verb frequency (see also Royle, Jarema & Kehayia 2002a; 2002b; 2003 for frequency effects found in online studies of verb processing in French speakers with familial language impairment). Jakubovicz and Nash (2001) showed that French school-aged children with SLI, especially younger cohorts (mean ages 6;8 and 8;2), had more difficulties producing passé composé versus present tense forms, while control children showed full mastery of present and passé composé production after age 6 (mean age 6;7). Young speakers with SLI also had difficulties in a sentence-picture matching task for passé composé comprehension (below 65% correct), while control children as young as three years of age scored over 85% correct on this measure. A subsequent elicitation study comparing the production of the passé composé and the pluperfect (il avait bu, 'he had drunk') in children with SLI (mean age 6;10) and two control groups (mean ages 3;5 and 4;5) revealed that language-impaired children had significant difficulties producing the passé composé along with complete inability to produce the pluperfect (Jakubovicz, 2003). Although some children were able to produce a number of appropriate responses, they performed inconsistently across items. Errors noted include responding with present tense forms or bare past participles and refusal to respond. In sum, school-aged children and adults with language

impairment have difficulties producing inflected verb forms in elicitation tasks and seem to be insensitive to verb internal structures (conjugation group), while remaining sensitive to verb frequency. To date, verb conjugation group effects on production abilities in children with SLI have not been systematically studied in preschool children learning French. In her study of school-aged children, Jakubovicz (2003) includes regular and irregular verbs in her design but does not consider verb conjugation group effects. Rose and Royle (1999) observed no verb conjugation effects on their task, but had not developed stimuli to specifically address this issue. The present study aimed to identify early linguistic markers of language impairment in French-speaking preschoolers. We addressed children's ability to produce regular and irregular verbs in French while controlling stimuli for age of acquisition. The idea was to verify whether French-speaking children with SLI are sensitive to the morphological properties of verbs. We developed an experiment in which unimpaired French-speaking pre-school children with SLI were prompted to produce passé composé forms of frequent regular and irregular verbs. Other measures of linguistic maturity such as MLU, verb and overall vocabulary size, and spontaneous use of inflected forms were included to control for factors previously correlated with emerging linguistic ability in children. We used an elicitation task for a number of reasons. First, it allowed us to control stimuli for factors such as age of acquisition and conjugation group. Second, although children with SLI can produce morphosyntactically appropriate forms in spontaneous speech output, they often have difficulty extending their linguistic abilities to novel forms and less well known verbs (van der Lely & Ullman, 2001; Rose & Royle, 1999). This suggests that they do not have a productive rule for inflection. The use of an elicitation task allowed us to address this issue. In addition, when morphophonological features are controlled for in the stimuli, results often reveal an absence of productive linguistic rules (see for example Goad, 1998 and her analysis of allomorphic variation on

English plurals produced by the KE family). Therefore, an elicitation task can be quite useful in revealing linguistic abilities and limitations in children with SLI.

Predictions

A number of specific predictions for expected output can be made under the different language acquisition models in the presence of SLI. According to the implicit rule deficit (RD) theory of SLI, neither rule-generating nor grammatical checking processes are available to children with SLI. These children would be expected to have great difficulty performing this task. A number of specific patterns should arise in the responses of children with impairment. First, they would show a lack of sensitivity to the verbal conjugation group. Regular and irregular verbs of similar frequency should be equally difficult (or easy) to produce in the presence of a language deficit.ⁱⁱ Second, children with SLI should not produce overregularizations, as these are believed to be linked to the acquisition of a productive rule for inflection (at least in dual-route language acquisition models). Finally, they would be expected to make more random errors in their output, e.g., producing inappropriate verb tenses and ungrammatical structures (including bare past participles) instead of target responses, since they are unable to check for grammatical appropriateness.

According to the Optional Default (OD) theory, children with SLI should exhibit patterns similar to those of control children, but with protracted acquisition. Expected error patterns would be past participles produced without the auxiliary and infinitive and present (stem) forms produced in contexts requiring other tenses, as seen in all children acquiring French (Paradis & Crago, 2001). This theory does not specifically relate to the issue addressed here, i.e. a potential distinction between regular and irregular inflection. Nor is the notion of default related to this distinction. According to the Computational Complexity (CC) account, children with SLI should exhibit different patterns than controls (rather than protracted patterns): production of bare past participles only, with few syntactically

complex structures. Again, no link is made between verb conjugation group and production pattern. In other words, no differences should be found between regular and irregular verbs. Finally, according to the Surface/Sparse morphology (SM) account, we expected to observe generally good production of the passé composé, since French is an inflecting language with salient morphemes. That is, providing the children have reached a level of linguistic development appropriate for the emergence of this form. Similar to the optional default account, the linguistic behaviour of children with SLI should be protracted but similar to that of children without language difficulties. However, children with a language disorder would be expected to produce overregularizations (if these are also found in children without a disorder), in addition to stem (present) forms and past participle forms without auxiliaries, since they are unstressed. According to this hypothesis, neither random errors nor morphologically and syntactically more complex structures would be expected.

INSERT TABLE 1 ABOUT HERE

METHODS

Participants

The children in this study had participated in a larger study on SLI in French-speaking children (Elin Thordardottir & Namazi, 2007). Participants with SLI (nine boys and two girls aged between 37 and 52 months, Mean: 45;5) were recruited from a hospital clinic and a paediatrician's office. Some children had a previous diagnosis of language impairment or severe language delay, and some of them had received intervention. The remaining children were on a waiting list for language evaluation for late speech onset or poor language development. Language-impairment status for this study was verified by

a certified speech-language pathologist, based on history and language scores. MLU scores were compared to a database of preliminary norms for Quebec French (Elin Thordardottir, 2005; Elin Thordardottir, et. al., 2005). Presence of language impairment was confirmed in 12 out of a total of 17 children who were referred for the SLI group. The remaining 5 children were excluded from the study. One of the 12 children refused to participate in the verb elicitation task. An age-matched control group was included (7 boys and 4 girls aged between 36 and 52 months, Mean: 44;4). The two groups did not differ significantly in age ($t(20) = .55, p > .1$) but differed significantly in MLU ($t(20) = -.596, p < .001$). Children were matched for age rather than MLU or vocabulary size because they were at very early stages of language development. Normally developing children matched for MLU would have been too young to perform the elicitation task. However, we performed post-hoc comparisons on results between certain children from both groups that showed overlaps on MLU or vocabulary measures. All children [underwent a hearing screening on the day of testing. A detailed description of the participants is provided in Elin Thordardottir and Namazi (2007).

Procedure

Children were asked to perform a verb-production task prompting use of the passé composé form for specific verbs. Verbs were controlled for conjugation group and age of acquisition (see below in Materials). Children also participated in individual play sessions designed to gather spontaneous speech samples. Measures obtained from the spontaneous speech samples included overregularization errors, mean length of utterance in morphemes (MLUm) and words (MLUw) and ability to use the passé composé (see Elin Thordardottir, 2005 for a description of transcription procedures). Parents were asked to fill out a questionnaire on their child's language history and the Quebec French version of the MacArthur Communicative Development Inventory parental checklist for language (Trudeau, Frank &

Poulin-Dubois, 1999). Measures extracted from this list included vocabulary size, verb vocabulary size, and vocabulary sizes for regular and irregular verbs.

Past-tense Elicitation Task

During the task, the experimenters prompted the participants to produce past forms by acting out verbs using props, two dolls and a puppet (Zobo). One of the dolls would comment on the other doll's actions, using the targeted verb in the 3rd person singular present tense (e.g., Isabelle: Regarde, il boit du jus, 'Look, he is drinking juice'). The puppet commented on the activity using the 2nd person plural present of the verb (e.g., Zobo: Vous buvez du jus tous les jours, 'You.pl drink juice every day'). The doll acting out the verb then mentioned how s/he liked performing the activity, using the infinitive form of the verb (e.g., Nicolas: Moi j'aime boire du jus, 'Me, I like to drink juice'). Finally, the first doll asked Zobo what the other doll just did. Zobo always forgot, as much as he might try to remember, and had to ask the child for help in answering the question. We held the child's attention throughout testing by using the puppet as an interlocutor and by introducing the props one at a time. We presumed that, after hearing the three forms produced, i) Infinitive (e.g., boire [bwar] 'to drink'), ii) 3p singular present (e.g., bois [bwa]), and iii) 2p plural present (e.g., buvez [byve]), the child would realize whether the verb was regular or irregular and then produce the appropriate passé composé form. A training session with four frequent regular and irregular verbs preceded the testing session proper. The task included 16 high frequency verbs (8 regular, 8 irregular).ⁱⁱⁱ In all trials, children were scored correct for producing the full passé composé with the target verb in the first utterance. All responses were recorded and error types were compiled. In the error analysis, all multiple answers on the same item were analyzed. Responses included 1) Target (full passé composé with the auxiliary^{iv} and past participle; pronouns were not scored); 2) Overregularization (e.g. il a ouvré [uvɛʁ] for il a ouvert [uvɛʁ] 'opened'); 3) Bare past participle (no auxiliary, e.g., *mangé for il a mangé); 4) Production of another tense (e.g., present); 5)

Production of another verb in the appropriate tense; 6) Production of another verb with overregularization; 7) Production of another verb with a bare past participle; 8) Production of another verb in another tense (e.g., il mange 'he is eating'); 9) Production of a noun (e.g., jus 'juice'); 10) No response or Refusal to respond; and 11. Uninterpretable / Other (onomatopoeia, prepositional phrases and adverbs, e.g., tatata; dedans le sable 'in the sand'; en haut en bas 'up down').

Materials

Regular (1st conjugation) and irregular (3rd conjugation) verbs (see Appendix A) were selected based on age of acquisition, as determined by a spontaneous speech corpus of 28 normally-developing monolingual French-speaking children aged 21-46 months (Elin Thordardottir, 2005). All verbs were produced at or before 30 months of age by at least one child, and were produced by at least 2 children in the sample (except boire – 'to drink'). We matched items on the number of a given verb's tokens used in the corpus, number of children using the verb, age at first production, number of graphemes, syllable length and thematic structure. Neighbourhood density, surface frequency and lemma frequency were verified for all past participle forms in the Frantexte database (New, Pallier, Ferrand & Matos, 2001). On most measures, both verb groups were roughly equivalent, with irregular verbs having fewer tokens on average in the corpus than regular verbs, but with higher surface and lemma frequencies in the Frantexte database. On average, irregular verbs were also slightly shorter and had phonological neighbours than regular verbs.

RESULTS

Percent correct responses on the verb elicitation task was used as the dependent variable and entered into a repeated-measures ANOVA, with verb conjugation group as the within-subject variable (regular, irregular) and participant group as the between-subject variable (SLI, control). A significant main effect of participant group was observed ($F(1, 20) 37.41, p < .001$), confirming that children with

SLI had difficulty producing appropriate inflected forms (M 5.58%, SD 5.9) compared to controls (M 45.45%, SD 20.75). A significant main effect of verb conjugation group was found ($F(1, 1) 48, p < .001$), with target regular verbs produced (M 35.8%, SD 35.21) more often than irregular verbs (M 15.34% SD 17.22). These main effects were subsumed by a significant participant group by verb conjugation group interaction ($F(1, 20) 37.93, p < .001$). Only the control group showed a significant difference in ability to inflect regular (M 64.77%, SD 26.11) over irregular verbs (M 26.14%, SD 18.08), whereas children with SLI did not show this pattern (regular: M 5.68%, SD 18.18; irregular: M 4.55%, SD 5.9). However, these results should be interpreted with caution, as children with SLI evidenced floor levels for target responses on this task.

Response patterns:

Since participants with SLI and, to a certain extent, typically-developing children had difficulties producing target verb forms, an error analysis was performed. Multiple responses to items were included in the analysis. This added thirty-two responses to our data (eighteen for the SLI group and fourteen for controls, including two target responses for the SLI group and four for the control group). Three of the additional responses (all from children with SLI) were not verbs. Errors were coded for each verb conjugation group and participant group. Response types are presented in Table 2. As shown, error types included overregularizations, bare past participle production, production of another tense (present stems accounted for 72% of these), production of another verb in the target or other tense (again, usually the present, at 84%), noun production, refusal to respond and uninterpretable response.

INSERT TABLE 2 ABOUT HERE

Focusing on types found in each group (the two Overall rows), it is clear that patterns differ widely depending on the presence or absence of a language disorder. Apart from the observation that control children produced more correct responses, we can see that children with SLI produced more bare past participles (on target and other verbs) than control children. In addition, although both groups substituted other verbs for target verbs, control children generally produced target inflections (the passé composé) (2d) while children with SLI tended to produce the bare past participle and other tenses—usually the present—more often than the target tense (examples of present (2a), periphrastic future (2b) and modal structures (2c) are given below).^v Inflection production patterns are illustrated in Figure 1.

2. a. Il joue piano ‘he plays piano’ for il a joué du piano ‘he played the piano’ (SLI, 51)^{vi}
- b. Il va manger du pain ‘he will eat bread’ for il a mangé du pain ‘he ate bread’ (SLI, 43)
- c. Veut l’ouvrir ‘wants to open it’ for elle a ouvert la boîte ‘she opened the box’ (SLI, 47)
- d. Al a roulé l’autobus ‘she rolled the bus’ for elle a vu l’autobus ‘she saw the bus’ (C, 38)

Children with SLI also produced nouns instead of verbs over 8% of the time (see examples in 3 below). Control children almost never did this (one child aged 36 months produced one token coco papa ‘egg daddy’ for il a cassé l’oeuf ‘he broke the egg’). Only children with SLI overtly refused to respond (see 4) or occasionally ignored the experimenter’s requests for a response. This was the most commonly found response type in children with SLI. The Uninterpretable response category (see 5) accounted for close to 13% of responses in children with SLI, but was quite rare in the control group. “Other”

responses accounted for less than 5% of responses in both groups, including onomatopoeia (6a, b) and the production of other syntactic structures or categories (not including nouns) such as (6c, d, e).

3. a. Du jus oui oui ‘juice yes yes’ for il a bu du jus ‘he drank juice’ (SLI, 38)
- b. L’auto ‘the car’ for elle a tenu l’auto ‘she held the car’ (SLI, 43)
4. Je ne sais pas ‘I don’t know’ or Non! ‘No!’
5. [a je kom] l’auto ‘she he-is like (?) the car’ for elle a tenu l’auto ‘she held the car’ (SLI, 50)
- [kapja ajé] pain ça ‘[kapja aje] bread that’ for il a mangé du pain ‘he ate bread’ (SLI, 43)
6. a. Glinggling for il a joué du piano ‘he played the piano’ (SLI, 47)
- b. Nanana for il a mangé du pain ‘he ate bread’ (C, 36)
- c. En haut, en bas ‘up, down’ for il a glissé ‘he slid’ (SLI, 49)
- d. À la boîte ‘to/of the box’ for elle a sorti le jouet ‘she took out the toy’ (SLI, 43)
- e. Dedans le sable de même ‘in the sand this way’ for elle a sorti le jouet (C, 36)

Taking a closer look at verb production patterns, Figure 1 highlights verb forms produced as a proportion of all verbs produced (other response types were excluded from the calculations). As can be seen, 70% of target and non-target verbs produced by controls are in the passé composé. This behaviour is the dominant pattern in control children. Children with SLI produced the bare past participle and other tenses (usually the present) for approximately 80% of target verbs and the passé composé for only 21% of target verbs. On non-target verbs, they produced other tenses for more than 40% of forms, while bare past participles and the passé composé account for 28% each of non-target verb production. Clearly, verb production patterns differ substantially between the two groups of children.

INSERT FIGURE 1 ABOUT HERE

With respect to response type for the different verb conjugation groups, we observe that control children produced regular forms more accurately than irregular forms, even though we took great care to match our items for age of acquisition. A second pattern that emerges is that control children commonly substituted a known (6), a semantically similar (7a) or an underspecified verb (7b) in the passé composé for irregular targets. Control children were almost three times as likely to replace irregular than regular verbs (regular: 16; irregular: 47), while SLI children were equally likely to replace regular and irregular verbs with non-target lexemes (regular: 18; irregular: 22). Replacement verbs tended to be irregular in both groups, although this trend was more marked in the SLI group (regular: 13; irregular: 27) than in controls (regular: 25; irregular: 37).

6. Elle a mis le jouet...elle a joué avec le jouet ‘she put the toy...she played with the toy’
for elle a sorti le jouet ‘she took out the toy’ (C, 46)
7. a. Al a pris ce jouet ‘she took this toy’ for elle a tenu l’auto ‘she held the car’ (C, 48)
b. Il l’a fait ‘he did it’ for il a dormi ‘he slept’ (C, 43)

Fourth, control children overregularized irregular verbs, not only into the first conjugation group (8a) but also into the sub-regular -ir conjugation (8b).

8. a. Elle a *tené [tene] / tenu [teny] l’auto ‘she held the car’ (C, 51)
b. Il a *ouvri [uvɛi] / ouvert [uvɛʁ] la boîte ‘he opened the box’ (C, 47)

Children with SLI did not produce overregularizations into either of the regular conjugations. One child with SLI (SLI, 44) produced the form ouvé^{vii} for ouvert ‘opened.’ However, since ouv- is not a possible

stem for the verb ouvrir, this is not an entirely legitimate example of overregularization. Finally, a pattern that emerged in the SLI children was a more frequent production of the bare past participle of *regular* versus *irregular* verbs. Control children showed this behaviour quite rarely (only four responses by three participants).

Our results show that productions abilities and patterns differ strongly between the two groups of children. Differences were observed in number of target responses, use of target tense versus other forms, sensitivity to verb conjugation class and production of grammatically appropriate forms (e.g., verbs versus other response types).

Correlation analyses

The question remains as to how and when children develop the ability to produce inflected verbs. Recall that Hiriarteborde (1973) proposed that the production of four tokens of the passé composé in a spontaneous speech corpus signifies the emergence of productive rule-use for this inflection in French-speaking children from France. This underscores the difficulties in detecting rule acquisition based on spontaneous speech samples. For example, children with SLI who participated in our study did not produce many passé composé forms in their spontaneous speech data, but neither did controls, and no errors were observed in these forms (see Elin Thordardottir and Namazi, 2007 for a discussion of the spontaneous speech data in twelve children with SLI, eleven of whom participated in our study). It is therefore difficult to infer certain structural language production abilities from spontaneous speech alone. We wanted to verify potential correlations between previously proposed measures of the emergence of productive use of tense and our results. More recent proposals linking vocabulary acquisition to productive rule use in children have been put forward by Bates and colleagues (see for example Bybee, 1995; Bates & Godham, 1997). Following Marchman and Bates (1994), we ran correlations between vocabulary measures taken from parental vocabulary checklists and correct verb

production. In addition, we ran correlations between age, MLU in words (MLUw) and correct productions. Finally, following Hiriarteborde (1972), we ran correlations between the use of the passé composé in the spontaneous speech corpus and the ability to produce the passé composé in the task. Correlations are presented in Table 3.

INSERT TABLE 3 ABOUT HERE

First, no correlations were found between measures in participants with SLI, whereas a number of correlations are present for controls. After a Bonferroni adjustment (alpha .05, $p = .0036$), only two significant correlations were found: 1) between production of the passé composé of regular verbs and MacArthur verb vocabulary size, and 2) between production of the passé composé of regular verbs and MacArthur regular verb vocabulary size. These correlations seem to be the result of regular verb acquisition, since irregular verb acquisition, as measured by the MacArthur checklist, does not correlate with the correct production of irregular targets. Figures 2 and 3 illustrate the correlation for control children and lack of same for SLI participants.

INSERT FIGURE 2 ABOUT HERE

INSERT FIGURE 3 ABOUT HERE

These results show that control children start producing target inflected regular verb forms some time after they have acquired a vocabulary of approximately 40 regular verbs and can reliably produce correct responses on over 65 regular verb items in the parental checklist. The data from the three SLI children with regular verb vocabulary sizes over 69 does not follow this pattern, with only one producing regular verbs in the passé composé, and at lower accuracy than control children. These results may indicate differential acquisition patterns between the two participant groups. The lack of significant correlations in the SLI group must be interpreted with great caution, however, due to the uniformly low scores on the elicitation probe. It remains to be seen whether a group of SLI children with larger vocabularies would show patterns similar to the control children or to the three children with SLI discussed here. On the other hand, these results support the importance of a system of morphology acquisition that is sensitive to regular patterns in unimpaired language acquisition, since there is no apparent correlation between irregular verb acquisition and correct passé composé inflection in control children. Again, this result must be interpreted with caution, as there were fewer irregular ($n = 23$) than regular ($n = 86$) verbs in the parental checklist, which could explain the stronger correlations observed.

The strong correlations between the ability to inflect regular verbs and verb vocabulary size supports the contention of Marchman and Bates that vocabulary size is an important factor in the emergence of overregularization patterns in the English past tense (1994), while refining it somewhat. Due to the effect found for regular verbs only, it seems that, at least in French, the acquisition of productive rules is sensitive to morphological structure.

Age, MLUw and total MacArthur vocabulary were significantly correlated with target production in control children, although not as strongly as the verb vocabulary measures, and after Bonferroni adjustment, correlations were not significant. However, MLUw was the only measure that correlated

significantly with target production of irregular verbs in controls. At an MLUw of approximately 2.6, each control child was already producing passé composé forms of regular verbs at 50% correct or more (in elicitation), while irregular forms were produced at this level by only one child, at an MLUw of 4.09. The SLI group did not show these trends: target responses on regular verbs did not exceed 37.5%, even at MLUws above 2.6 (two children in the SLI group).^{viii} These results indicate that passé composé developmental patterns are delayed compared to MLU development in children with SLI.

DISCUSSION

We found that children with SLI had the expected difficulties producing passé composé forms. They produced significantly fewer target forms than control children. We could argue that the children with SLI had not yet acquired inflectional rules, since they did not produce these forms in spontaneous speech. However, two children with SLI respectively produced 3 and 2 types of the full passé composé and 4 tokens each in the spontaneous speech sessions. These same children produced only one target response each in our task. All control children produced passé composé forms in their spontaneous speech (1-8 types, 2-14 tokens), and only one, the youngest, scored below 50% on regular verbs during elicitation. We may conclude that the early spontaneous use of inflected forms by young children with SLI does not necessarily signal the existence of a productive rule for the passé composé. In addition, control children produced more correct responses on regular verbs and overregularized irregular verbs. Better production of regular and overregularized sub-regular patterns (see 8b) suggests that French-speaking children are sensitive to morphological patterns with low type frequencies in the input, can extract them and can productively use them to inflect verbs (see Royle, 2007 for a detailed discussion). Based on the rule deficit account of SLI, it was expected that typically developing children, and not children with SLI, would produce overregularizations on irregular verb prompts. Similarly, we did not expect to find sensitivity to morphological patterns in children with SLI. Based on previous research

(Rose & Royle, 1999), we expected that they would produce more random erroneous outputs than control children.

We also observed that, although some production patterns were found in all the children, both groups showed distinct performance patterns. In particular, we found that French-speaking children with SLI did not produce the passé composé in linguistically constrained contexts and tended to produce other tenses (usually the present) and bare past participles, in addition to nouns and other incongruous structures. Control children tended to produce the passé composé, either with the target verb or another form, but showed better performance on regular verbs. Relating these results to the hypotheses, we see first that production patterns differed between the control and SLI groups, which provides little support for the argument that children with SLI have protracted but normal acquisition patterns (Optional Default and Surface/Sparse Morphological hypotheses). However, because there was no control group of children matched for language abilities, these hypotheses cannot be fully evaluated in light of our data. The lack of sensitivity to verb conjugation group also goes against the Surface/Sparse Morphology hypothesis, because if linguistic typology affects language acquisition, we would expect more regular and recurring patterns in children with SLI. Focusing on error patterns, the Optional Default and Rule Deficit accounts are both supported by the data, particularly in terms of production of past participle and present (or stem) forms. However, infinitives were rarely produced ($n = 3$), and by only one child with SLI during the task (see 9a, b for infinitives, and 9c for an infinitive used for the past participle). According to the Optional Default hypothesis, we expected more of these forms. Recall, however, that past participles of regular verbs are homophonous with the infinitive, and that only irregulars can be used for this type of comparison. Even so, although there were many opportunities to produce infinitives, they did not appear.

9 a. Il dormir ‘he sleep-INF’ for il a dormi ‘he slept’ (C, 38)

b. Tenir l'auto 'hold-INF the car' for elle a tenu l'auto 'she held the car' (SLI, 47)

c. Al a mettre un tablier 'she AUX put-INF an apron'

for elle a mis un tablier 'she put an apron on' (C, 44)

Noun production is not predicted under any account of SLI. However, under a rule deficit account, based on the notion of operations over variables (Marcus, 2001; Pinker, 1999), the grammatical abilities of children with SLI can be affected in spheres other than inflection. Here, the choice of a different variable (Noun, etc.), albeit semantically close to the target (the child is talking about an event containing a reference to an object), would be inappropriate. Under this account, children with SLI are expected to err outside the normal cluster of appropriate responses (i.e. Verb) to a given question. Alternatively, the use of nouns instead of verbs may indicate an early developmental pattern that control children have outgrown.^{ix} Future studies including children matched for language level could explore this issue.

The production of more regular than irregular past participles in children with SLI could be construed as support for the hypothesis that passé composé forms are computationally complex to produce, and that a child with a language disorder produces a form as close as possible to the output, while eliminating some structure. Alternatively, the child could be producing an optional default form. However, this interpretation does not explain the difference we found between regular and irregular verbs for this response type (17 regular tokens vs 4 irregular ones). We argue instead that the child most probably echoes the input. Since the past participle, infinitive and 2pp present forms of regular French verbs are homophonous and were provided as input, it is likely that the child produced this phonological form following activation in the child's lexicon, not realizing that it was ungrammatical in the absence of an auxiliary. Finally, because children with SLI showed no correlations between vocabulary (and other measures) and task scores, and because a number of children with SLI with vocabulary and MLU levels similar to controls produced fewer passé composé forms than their peers, we can take this as an

indication that the SLI children were less able to extract a rule from a recurrent pattern, and that they needed more information than the control group to perform the task correctly.

SUMMARY AND CONCLUSION

We found differences between SLI and control groups on a number of linguistic measures. In particular, they differed in their abilities to produce regular and irregular verbs and in the relation of these abilities to MLUw and vocabulary scores. Response patterns on the passé composé elicitation task also differed between the two groups, not only in the production of target outputs, but also in response type. Control children showed emerging productive rule use, sensitivity to word-internal structures (conjugation patterns) and sensitivity to grammatical constraints. This was seen in their emerging ability to produce appropriate responses and overregularization patterns. The SLI participants seemed not to have developed the same grammatical abilities or sensitivity as controls. They produced target forms with difficulty, omitted auxiliaries and produced inappropriate responses after prompting. It also appears that French-speaking children with SLI had disproportionate problems producing verb inflections. Even when their vocabulary or MLU is larger, children with SLI show dissimilar acquisition patterns to controls. This may reflect a deficit in productive rule use resulting from a grammar unable to perform operations over variables, or it might reflect a lesser ability than typically developing children to extract patterns from input. To further investigate this effect, SLI children with more advanced language skills should be studied.

Results on the elicitation task in this study should be interpreted with caution, as the participants were quite young. However, some children with SLI overlapped with controls on either MLUw or verb vocabulary measures. They showed no evidence of comparable linguistic ability with matched controls. In a number of children with SLI, we observed a distinction between the ability to produce the passé

composé in spontaneous speech and to use it as a response to prompting. Given their performance on spontaneous speech (see Elin Thordardottir & Namazi, 2007), this indicates that spontaneous speech corpora and elicitation tasks can produce conflicting results for language abilities in French-speaking children with SLI. Elicitation and spontaneous production differ in several ways, including the child's control over what is said and the 'naturalness' of the interaction. The children in this study performed more poorly on elicitation than spontaneous language tasks. We could conclude that the two contexts provide different information on the children's abilities and that early use of forms such as the passé composé in spontaneous language may not reflect the emergence of a fully productive inflectional rule. Alternatively, the contrived nature of the elicitation task may have taxed these young children, and they might have performed better in a more natural setting.

The elicitation results do not clearly determine whether children with SLI are sensitive to the distinction between different verb conjugation groups, since they produced few correct responses for both target types. Moreover, in contrast to the control group, there were no significant differences between the strategies they used to produce responses on regular and irregular verbs. Error analyses revealed that the only effect of verb conjugation pattern observed in SLI participants was the production of more forms resembling the past participles of regular targets. This might be due to the repetition of the homophonous (infinitive and 2ppl) form in the input. Other patterns unseen or unusual in control children were the production of nouns instead of verbs and refusals to respond. These are similar to patterns observed by Rose & Royle (1999) in a real- and novel-verb elicitation task in older French-speaking participants with familial language impairment, and by Jakubovicz (2003) in older children with SLI. Faced with a verb elicitation task, participants with SLI have enormous difficulties producing appropriate responses, even after many years of exposure to their mother tongue. The absence of

overregularization and the observed insensitivity to obligatory tense marking, even at comparable MLU levels, points to disproportionate difficulties in this area.

Elin Thordardottir and Namazi (2007) analyzed the spontaneous use of verb inflection in the children with SLI that participated in this study and compared them with a control group matched for MLU.

Overall, accuracy rates were similar (and high) in both groups. However, the use of bare past participles or infinitives, albeit quite uncommon, was more characteristic of children with SLI than age-matched or MLU-matched controls. Since the children in our study were very young, a control group matched for linguistic measures such as MLU was not included, as such a group would be too young to complete the elicitation task. It would be worthwhile to pursue this experiment with older cohorts matched for MLU measures. It is likely that older children with SLI would perform better on the elicitation task than the young children in this study. Further studies could explore how older children with SLI compare with MLU-matched controls on accuracy and error patterns, and would enable more meaningful conclusions on the nature of the deficit. However, based on previous studies by Jakubovicz (2003) and Rose & Royle (1999), we would expect SLI participants to produce different patterns of correct responses and errors from controls.

With regard to the correlations on the results, the control children show correlations between vocabulary measures, MLUw measures and age and linguistic development (e.g., productive use of the passé composé). These results are consistent with those by Marchman and Bates (1994), and they underscore the importance of linguistic input for language development, especially concerning the differential effects of regular and irregular verbs. The children with SLI did not show these correlations. However, given their floor results on the elicitation task, it is unclear whether this non-correlation was caused by the absence of productive rules or simply by a delayed language acquisition process.

A first step to avoid floor effects in future would be to study children at a slightly older age. A closer look at children without language disorders would be useful. Royle (2007) analyzed the inflectional ability of 15 French-speaking children (11 of whom were controls in this study) to produce the passé composé. She found that children under the age of 38 months were unable to perform the task. She also observed that, although older children could reliably inflect high-frequency regular and irregular verbs, they were not necessarily able to inflect low frequency (regular and irregular) verbs. Only a subset of older children could provide the passé composé on low-frequency verbs. Based on Royle's data, we propose that French-speaking children develop the ability to productively inflect verbs between 44 and 48 months. Therefore, this task should not be run on children with or without language disorder before that age, as the results would presumably not offer useful data. However, this leaves us with the problem of identifying language disorders in young children. One solution would be to elicit structures that are produced by all children at the initial stages of French language acquisition. The complex noun phrase, with its attributive adjectives and determiners that agree with the noun (including gender features), is a structure produced at the beginning of the two-word stage. Results of pilot studies eliciting the complex noun phrase are promising: French-speaking children aged 30 months can reliably produce simple structures containing adjectives such as la petite maison 'the.fem small.fem house' or le cheval vert 'the.masc horse green.masc' (Royle et al., in press). A spontaneous-speech study of Spanish-speaking children with SLI revealed agreement errors in attributive adjectives (Bedore & Leonard, 2001), and we also found this in a French-speaking child with SLI in our elicitation task (Bouffard & Royle, 2007; Royle, ongoing). An adjective elicitation task could therefore identify language difficulties in very young children with suspected language disorders, while verb elicitation tasks could confirm a language disorder diagnosis in older preschoolers.

In conclusion, our results suggest that the acquisition of productive verb inflection in French is disrupted in children with SLI, this in terms of more than just acquisition timing. Some linguistic behaviours in the SLI children were atypical of normal development. Lack of sensitivity to verb conjugation group and the production of inappropriate structures, even when presented with early acquired verbs, set the children with SLI apart. Our data also show that different data gathering techniques can bias our understanding of a child's linguistic abilities. We should use them with a clear understanding of their purpose and limitations.

APPENDIX A1: Verbs used for the elicitation task

Verb	Tokens in corpus	N of Children Using Verb	Age at 1st Token	N of Phonemes	N of σs	N of Phono. Neighbours	Frequency ^a	Lemma Frequency ^b	Transitivity
<i>Irregular</i>									
<u>bu</u> – 'drink'	1	1	26	2	1	15	21,77	482,66	T/I
<u>dormi</u> – 'sleep'	6	5	23	5	2	2	13,74	145,44	I
<u>mis</u> – 'put'	25	9	26	2	1	13	199,74	944,56	T(2)
<u>ouvert</u> – 'open'	8	6	27	4	2	3	64,13	431,13	T
<u>parti</u> – 'leave'	9	4	26	5	2	7	112,71	1210,10	I
<u>sorti</u> – 'take out'	6	4	33	5	2	3	38,06	748,70	T/I/T(2)
<u>tenu</u> – 'hold'	12	9	26	4	2	3	55,81	615,19	T
<u>vu</u> – 'see'	12	4	33	2	1	13	282,71	1726,48	T
MEAN	9,875	5,25	27,5	3,625	1,625	14,75	98,584	788,033	
STDEV	7,079	2,712	3,585	1,408	0,517	10,333	95,703	499,758	
<i>Regular</i>									
<u>caché</u> – 'hide'	10	3	27	4	2	30	21,94	134,68	T/R
<u>cassé</u> – 'break'	5	4	24	4	2	29	13,26	79,21	T/R
<u>glissé</u> – 'slide'	17	7	25	5	2	8	12,23	132,41	I
<u>joué</u> – 'play'	16	9	33	3	2	16	33,13	353,68	I
<u>lavé</u> – 'wash'	4	2	33	4	2	17	7,06	51,16	T
<u>mangé</u> – 'eat'	20	9	26	4	2	13	15,87	160,73	T/I
<u>monté</u> – 'go up'	23	8	26	4	2	16	20,52	289,18	T/I
<u>tourné</u> – 'turn'	4	2	26	5	2	9	26,84	277,15	T/I/R
MEAN	12,373	5,5	27,5	4,125	2	17,25	18,856	184,775	
STDEV	7,614	3,070	3,505	0,641	0	8,242	8,477	108,752	

^a Grapheme (surface) frequency per million, from *Frantexte* (New et al., 2001)

^b Cumulative frequency per million, from *Frantexte* (New et al., 2001)

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Table 1: Overview of predictions based on SLI theories

Model	Unimpaired	Acquisition patterns	SLI	Error Patterns
	Regular vs. Irregular		Regular vs Irregular	
CC	?	≠	?	*AUX PP
RD	R > I	≠	R = I	Inflection and random errors
OD	?	>	?	*AUX PP, Infinitive, Stem
SM	R > I	>	R > I	*AUX PP, Stem

Table 2: Mean percent response types for each verb group in both participant groups.

<i>Group</i>		Target Verb				Other verb				Other responses			
		T	PP	OR	TNS	PC	PP	OR	TNS	Noun	No R	Uninterp.	Other
<i>SLI</i>	<i>Regular</i>	7.77	15.53	—	12.62	7.77	3.88	—	7.76	4.85	25.24	10.68	3.88
	<i>Irregular</i>	4.44	4.44	1.11 ^a	8.89	4.44	7.78	—	13.33	12.22	23.33	15.56	4.44
	<i>Overall</i>	6.22	10.36	0.52	10.88	6.22	5.7	—	10.36	8.29	24.35	12.95	4.15
<i>Control</i>	<i>Regular</i>	59.22	2.91	—	9.71	10.68	—	2.91	0.97	0.97	—	0.97	3.88
	<i>Irregular</i>	26.67	—	13.33	7.78	36.67	1.11	1.11	11.11	—	—	2.22	5.56
	<i>Overall</i>	44.74	1.58	6.31	8.42	23.16	0.53	2.1	5.78	—	—	1.58	4.73

T = Target, PP = Past participle without AUX, OR = Overregularization, TNS = Other tense, PC = Passé composé, No R = No response, Uninterp. = Uninterpretable, Other = Other response

^a Bare past participle

Table 3: Correlations between age, MLUw, PC types and tokens in corpus, vocabulary measures, and target responses produced divided by verb group for participants with SLI and controls.

	SLI		Control	
	Regular	Irregular	Regular	Irregular
<i>Age</i>	ns	ns	.675*	ns
<i>MLUw</i>	ns	ns	.702*	.679*
<i>PC types in corpus</i>	ns	ns	ns	ns
<i>PC tokens in corpus</i>	ns	ns	ns	ns
<i>Total MacArthur vocabulary</i>	ns	ns	.711*	ns
<i>Total MacArthur verbs</i>	ns	ns	.835**	ns
<i>Regular verbs in MacArthur</i>	ns		.791**	
<i>Irregular verbs in MacArthur</i>		ns		ns

* $p < .05$ (two-tailed Pearson correlation)

** $p < .01$ (two-tailed Pearson correlation)

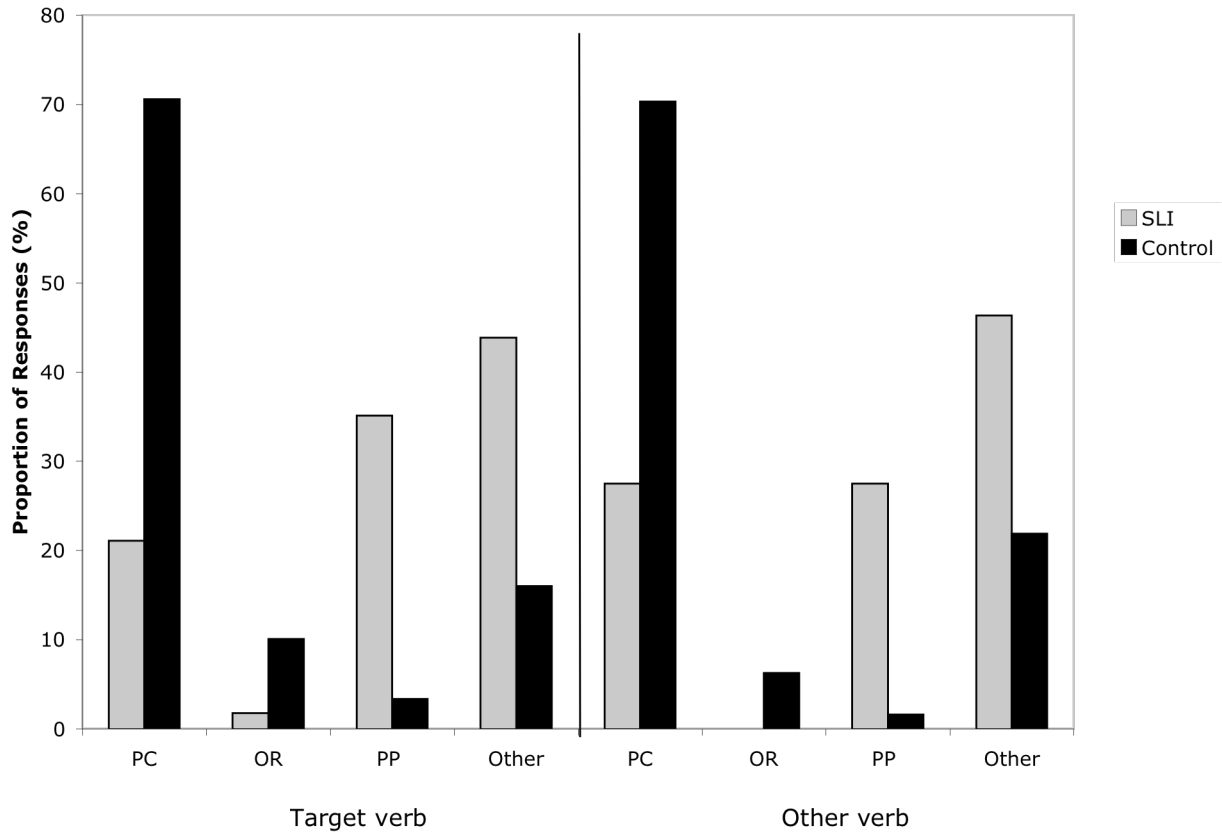


Figure 1: Proportion of response types on target and non-target verbs in both participant groups

PC: Passé composé

OR: Overregularization

PP: Bare Past Participle

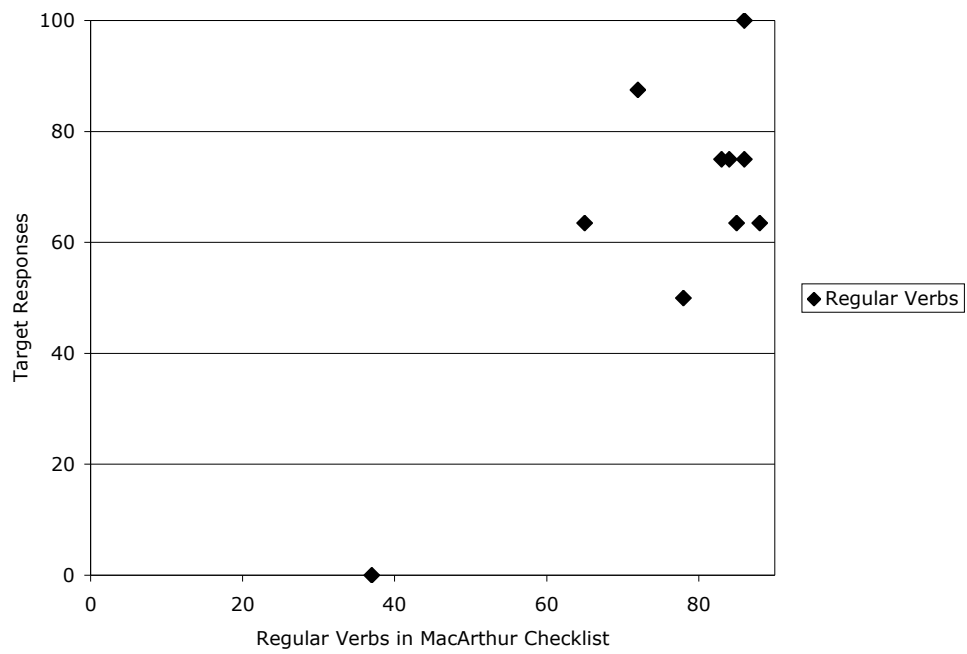


Figure 2: Correlation between regular verb vocabulary in the MacArthur checklist and target regular verb production in Control children.

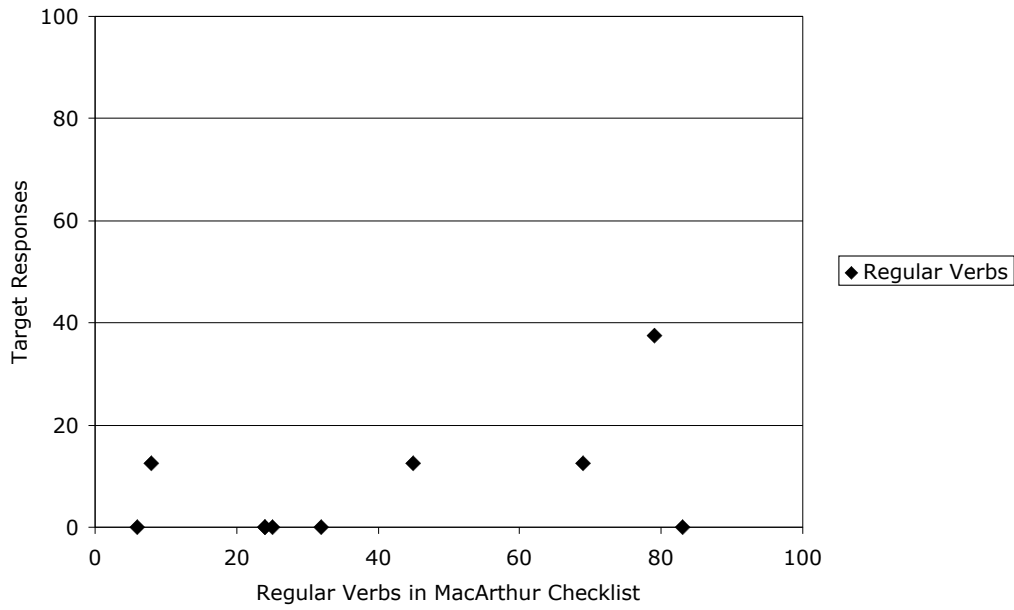


Figure 3: Correlation between regular verb vocabulary in the MacArthur checklist and target regular verb production in participants with SLI.

ⁱ An anonymous reviewer notes that these forms are tensually ambiguous. However, our experiment was not designed to verify this issue.

ⁱⁱ Two anonymous reviewers maintain that, according to the rule deficit theory, children with SLI should perform better on irregular than regular forms. However, we disagree with this interpretation. In particular, with high frequency forms, we believe that both irregulars and regulars would be treated in a similar fashion (i.e. item-based). The reviewers' interpretation of this is a logical error (*non-sequitur*). The model posits that children with SLI should have difficulties inflecting verbs using regular inflectional processes. This does not imply that they would have less difficulty producing irregulars than regulars. "To the extent that regular and irregular forms are equally frequent, they will both be available to the same degree because they are both memorized. There is no reason for one to be more impaired than the other." (M. Paradis, personal communication 25.09.2007). While children with no language impairment should be able to deal with regulars using either lexically-based or rule-based procedures, what we would *not* expect is better performance on regulars than irregulars in children with SLI, since rule-based procedures are not available to them (Paradis & Gopnik, 1997; Ullman & Gopnik, 1999).

ⁱⁱⁱ A second section of the task contained 16 low-frequency verbs. Participants with SLI were unable to score over 50% correct on the first section of the task and did not proceed to the less frequent verb section. See Royle, Rivard, and Elin Thordardottir (2004) and Royle (in press) for a discussion of frequency effects in verb production in French children without language impairment.

^{iv} Auxiliary choice errors (e.g., être 'to be' for avoir 'to have') were not considered

^v Modal, future and periphrastic future forms were quite rare (n = 6). Other tenses were occasionally produced by control children (n = 4).

^{vi} All examples indicate participant group and age in months.

^{vii} An anonymous reviewer notes that this form might be an example of difficulties in coda production. We reviewed this child's verb production and found that he did produce codas (e.g., mange [maʒ] un pain 'eats a bread', [e] cache [kaʃ] '[e] hides', bu du gaz [gɑz] 'drank gas', a va en voyage [vwoʒɑʒ] 'she is going on a trip', il glisse [glis] vite ça 'he slides quick that', etc. However, [ʁ] codas were not included in the verb task and might still be problematic).

^{viii} The child with SLI who produced 37.5% correct responses on regular verbs had an MLU of 2.13.

^{ix} Another interpretation of this, following Paradis and Gopnik (1997), is that children with SLI might rely heavily on pragmatic aspects of language to compensate for their morphosyntactic weaknesses, thus producing a conceptually appropriate noun describing some aspect of the event rather than the expected verb.