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On the presence and absence of *that* in aphasia

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Background: Deficits in the production of complex structures have been widely documented in non-fluent forms of aphasia. Nevertheless, the data available on fluent deficits are scarcer. In both cases, reduced complexity is attributed to syntactic factors. In the related field of syntactic theory, there exist a number of studies on the production of non-brain damaged (NBD) subjects which try to account for the existence of two alternative constructions in embedded complement clauses in English (as in I think that the situation will improve/I think the situation will improve). The absence of that in the embedded clauses of verbs like say, know or think in colloquial English is very frequent and this suggests that verbs of this type may select a clause lacking a complementiser phrase (CP) layer, namely tense phrase (TP). The presence of that is taken to be the result of insertion, which is triggered by cues associated to contextual factors like register.
Aims: To compare the presence and absence of the complementiser that in the speech of English subjects diagnosed with aphasia with the same phenomenon in NBD subjects with the objective of clarifying the nature of the phenomenon of that-omission.
Methods & Procedures: We carried out an analysis of spontaneous speech that included the performance of 200 individuals brought together by the AphasiaBank project. Two groups were included in the study, an experimental group comprising 100 individuals diagnosed as aphasic according to the standards of the Western Aphasia Battery (WAB), and a control group including 100 non-brain damaged control subjects (NBDs).
Outcomes & Results: This study shows that the asymmetries across populations (NBDs vs. subjects with aphasia) are restricted to the number of occurrences of subordinate clauses. NBD subjects produce more embeddings than subjects diagnosed with fluent aphasia (although they do produce embedded clauses and crucially prefer the "omission" option) and subjects with non-fluent aphasia.
Conclusions: Our results confirm the findings on fluent aphasias as for the presence of deficits with complex constructions. These results may be regarded as evidence for the claim that TP is the default selection for the verbs analysed.

Keywords: Aphasia; "That"-omission; Embedding; Fluency; English.

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In this article, the production of embedded finite clauses in English-speaking subjects with aphasia is analysed with the aim of considering whether the phenomenon known as *that*-omission, as illustrated in (1b), is also found in the performance of this group, and whether or not it can be accounted for in relation to non-brain damaged (NBD) production.

(1) a. I think that the weather is changing.
 b. I think the weather is changing.

In terms of syntactic structure, finite embedded clauses are regarded as being dominated by a complementiser phrase (CP). This follows from the assumption that embedding implies the activation of the CP layer, which frequently includes the presence of an overt complementiser (e.g., *that*). Therefore, the English construction involving *that*-omission has led linguists to postulate different types of mechanisms to account for an apparent optionality between presence and absence of *that*, as in (1a) and (1b). Since Stowell (1981), who proposed an empty category in C in constructions like (1b) in a Government and Binding approach, other researchers have provided different accounts as the theory evolved towards minimalism (see Bošković & Lasnik, 2003; Pesetsky & Torrego, 2001; Rizzi & Shlonsky, 2007).

These proposals, although detailed in their accounts of contrasts and related constructions, do not take into account the use of the construction in context. When one considers real usage and relates it to the presence/absence of the so-called complementiser *that*, it turns out that the "omission" option, (1b), is much more frequent in colloquial English. LLinàs-Grau and Fernández-Sánchez (in press) have analysed its production and discovered a percentage of 97% of *that*-absence in colloquial speech. In view of this, the account of this construction seems to be necessarily related to the context of use.

As regards the production of aphasic population, we may expect our results to be similar. Asymmetries across populations (NBDs vs. subjects with aphasia) are predicted to arise, but only in the number of occurrences of correct subordinate constructions and not in the structure of correct constructions with or without *that*. As will be explained in Section 4, while we find a high percentage of subordinate clauses in the production of subjects diagnosed with fluent aphasia, numbers drop dramatically in the case of non-fluent deficits as expected.

The structure of this paper runs as follows. Section 1summarises theoretical accounts of the phenomenon and considers its underlying syntactic structure. Section 2shows how use must be given a prominent role in the account of this construction. In Section 3, we consider the issue of aphasia and complex structures. In Sections 4 and 5, we present our methodology and the analysis of spontaneous speech data brought together by the AphasiaBank (MacWhinney, Fromm, Forbes, & Holland, 2011). Section 6 relates the considerations made in Sections 1 and 2 to the aphasic data results. Section 7concludes the article.

THE UNDERLYING SYNTAX OF *THAT*-OMISSION

Before we present the analysis of the data under study, let us first go through some of the properties that characterise the two constructions in (1a) and (1b), repeated here, as (2):

(2) a. I think that the weather is changing.
b. I think the weather is changing.

The two options do not differ in meaning; the absence of a complementiser does not have any semantic effects. Both are instances of embedding where a verb selects a finite clause which is introduced by a *that*-element (2a) or not (2b). The only effects that are evident are those at the phonological level.

The syntactic structure associated to this construction is that of an embedded finite clause, which in generative grammar is associated to a CP. The lack of an overt C head in (2b) has received the attention of a number of scholars who have provided different accounts of the *that*-omission phenomenon. In the 1980s, an empty C element was assumed to occupy the C position (Stowell, 1981). Later, Pesetsky (1992) proposed it was a null-affix, a non-overt morphological element that had to attach to a verbal head. In an updated version of this view, Boškovic and Lasnik (2003) posited a phonological mechanism in (2b), PF Merge, which involves the combination of two elements (in this case a non-overt affix and a verb) in the phonological component. This mechanism only applies if adjacency holds between the verb and the null affix in C position. This disallows constructions like (3b), where the embedded clause is not adjacent to any selecting verb as the embedded clause is the subject of the sentence:

(3) a. That the situation will change is obvious.
b. * The situation will change is obvious.

A different account of the phenomenon is proposed by Rizzi and Shlonsky (2007), who relate it to the mechanism of "truncation" (Rizzi, 1993/1994). This mechanism was first associated to child language, which allows certain syntactic layers to be absent as a result of a relaxation of the axiom "*A root clause is dominated by a CP projection*".

Rizzi and Shlonsky (2007) analyse constructions like the one in (2b) as a result of internal truncation. For these authors, this is a property of English and explains the contrast between (4a) and (4b) below. Extraction of an embedded subject is only possible in (4b), where internal truncation applies (i.e., there is no CP node dominating the embedded clause).

(4) a. * Who did you say [$_{CP}$ that called you]?
b. Who did you say called you?

Still another syntactic account of the phenomenon of *that*-omission is given by Pesetsky and Torrego (2001), who take a completely different view assuming *that* to be a tense element originating in tense phrase (TP), a clausal layer which stands below CP. *That* occurs in the T head position of TP and is an affix that surfaces as *that* when it moves to C, the operation assumed to underlie (2a). For Pesetsky and Torrego, there is another element that can also move to the CP layer, the nominative subject. The movement of this other element is a consequence of their particular conception of nominative case. What is relevant for our purposes is the fact that there are two elements, *that* and a nominative subject, that can both move to CP at an equal syntactic cost. Therefore, their account predicts optionality of (2a) and (2b), something that does not seem to be borne out by the facts, as we will see below.

As can be observed from the above summary, these different proposals arise from specific research aims and are related to the account of other associated constructions. This is an obvious desirable theoretical achievement, but these core-syntax proposals miss one important factor in the choice of including or excluding *that*: language in context, use.

When the *that*-omission phenomenon is considered in real production, it turns out that in conversation register it is very difficult to find an embedded finite clause selected by verbs such as *think/say* and *know* introduced by an overt *that*. The default construction is (2b), with an absent *that*. The corpus grammar of Biber, Johansson, Leech, Conrad and Finegan (1999), which analyses 40 million words, concludes that the absence of *that* is the norm in "conversational" style. Other grammarians also relate its absence to "conversational" or "informal" styles (see for example, Quirk & Greenbaum, 1982; Swan, 1980). In LLinàs-Grau and Fernández-Sánchez (in press) data from adults in several files of the CHILDES corpus were analysed and of a total of 3288 utterances, absence of *that* came up to 97%.

Taking this into account implies considering performance to be a relevant factor in the explanation of this phenomenon. Nevertheless, although language use is granted a prominent role, it is still necessary to consider its syntactic representation—the knowledge underlying the construction. In this respect, there is a proposal that takes a completely different perspective in the analysis of *that* presence and absence which can shed some light as regards what the most adequate syntactic representation of this construction is, Franks (2005). In his paper "What is *that*", Franks assumes there are different types of *that*, one of which is not a proper syntactic head, but an element inserted post-syntactically. This is the *that* assumed for the construction in (2a). This author classifies verbs like *say/think/know* as "bridge" verbs, whose essential property is the ability to select a bare TP, that is, a finite clause without a CP layer. If the construction emerges with a *that*, it is the result of a post-syntactic process of *that*-insertion. This proposal inverts the explanation to one of "insertion" instead of "omission". Thus, in his view *that* is added to a structure which lacks a CP layer and when it is absent there is no omission. The crucial idea in Franks (2005) is that the presence of *that* in constructions like (2)a. is not related to syntax. Moreover, LLinàs-Grau and Fernández-Sánchez (in press) relate its presence to external factors. This approach to *that*-constructions opens the door to the consideration of other grammatical models which assume a closer interaction between grammar and context. One of these models, the Competition Model of Bates and MacWhinney (1989) can provide a way to account for insertion of *that* as a result of the presence of certain "cues".

Thus, the postulation of a series of cues that trigger the insertion of *that* is a way of linking a performance model, the Competition Model, with a competence model, the Minimalist Program. The *that* element in these constructions could be regarded as a device that occurs because of language-processing factors, constraints placed by the specific speech event, which are not related to identifiable syntactic features. We will not expand on the characteristics of the cues nor on how they are integrated into the underlying structure, but will provide two cues, which could be perceived by the speaker in context as triggering factors for *that*-insertion.

CONTEXT AS A TRIGGERING FACTOR FOR THE PRESENCE OF *THAT*

Considering again real use of the constructions under analysis, we find that there are at least two identifiable triggers to the presence of *that*, i.e., there are performance factors that favour the inclusion of a *that* in a finite embedded clause selected by verbs like *think/say* and *know*. These performance factors are: (a) non-adjancency and (b) formal/academic register.

When the embedded clause is not adjacent to the selecting verb, *that* emerges as the natural choice, as in (5).

(5) I think, and you will possibly agree with me, that things will improve in the near future.

In this example, non-adjacency is the result of an intervening parenthetical. The presence of *that* marks the initial boundary of the finite clause selected by the verb *think*. This is clearly a processing issue associated to the comprehension of the sentence.

In addition to non-adjacency effects, we observe that the element *that* emerges as a preferred option in formal registers, such as the academic prose which Biber et al. (1999) have analysed. In LLinàs-Grau and Fernández-Sánchez (in press), 78 Letters to the Editor in *The Economist*—a context of formal language use—were examined, and a higher percentage of *that*-presence was also found, absence reaching only 20%.

As an example of this second cue, we find that subjunctive mood also disallows the absence of the complementiser. Constructions like the following favour the presence of *that*:

(6) The judge insisted *that* the witness leave the room.

Subjunctive is not used in colloquial English, it is only found in formal academic register, a possible cue to *that*-insertion.

We suggest that the Competition Model of language processing can provide a natural account of the construction under analysis which, when observed in real use, seems not to be determined by any identifiable syntactic feature, but relates easily to performance cues.

APHASIA AND COMPLEX STRUCTURES

The term aphasia was coined to refer to a regressive form of pathology that affects linguistic skills in adults with normally functioning language systems prior to the onset of a lesion affecting brain areas involved in language processing. According to Ardila (2010), over 20 different aphasia classifications have been proposed in the literature. This gives an idea of the complexity and variability of the specific aphasic syndromes. Among the more widely spread proposals, the Boston classification system (Goodglass & Kaplan, 1972; see Ardila, 2010 and references cited therein) and Luria's (1970 and much subsequent work) stand out. In this work, we will focus on the classification provided by the Boston group which is based on two basic concepts: (1) speech fluency (fluent vs. non-fluent syndromes); and (2) location (cortical, subcortical and transcortical syndromes). The model distinguishes eight different syndromes.

Traditionally, fluent aphasias (sensory aphasia, transcortical sensory aphasia, conduction aphasia and anomic aphasia) have been claimed to correspond to syndromes generally associated to comprehension deficits; although the major impact of anomic aphasia is related to word retrieval. Anatomically, fluent aphasias are related to posterior lesions that bring about an effortless speech produced at a normal rate and with preserved patterns of intonation and stress. Non-fluent aphasias (motor aphasia, transcortical motor aphasia, global aphasia and transcortical mixed aphasia) group together those forms of the pathology which present major problems associated to spoken and written production. They are generally associated to lesions affecting the anterior portion of the brain hemisphere dominant for language; although in global aphasias, the lesion extends beyond these areas. The speech output is characterised as slow, effortful and full of pauses (Goodglass & Kaplan, 1972, 1983).

At the syntactic level, the performance of subjects with aphasia crucially depends on the specific diagnose. While grammatical deficits are commonly assumed in non-fluent aphasias (Grodzinsky, 2000), fluent aphasias tend to be characterised by prominent word retrieval difficulties (Edwards, 2005). However, fluent aphasic subjects have been found to produce structures that are less complex than those produced by non-brain damaged subjects (NBDs) (Bastiaanse, 2011; Bastiaanse, Edwards, & Kiss, 1996; Butterworth & Howard, 1987; Edwards, 2005). According to Niemi (1990), the occurrence of complex structures decreases in fluent aphasia. The results support Gleason et al. (1980) findings for Wernicke's aphasia that included fewer embeddings and relative clauses than their control counterparts. The same pattern of performance was attested by Edwards and Bastiaanse (1998) for English; however, Dutch results do not show this decrease in the amount of complex structures.

The subordination deficit in non-fluent aphasias has received more attention, especially in subjects with agrammatism. Failure to produce complex structures has been documented for several typologically different languages including English, German, Dutch, Swedish, Polish, Finnish, Japanese or Italian (Bates, Friederici, Wulfeck, & Juarez, 1988; Hagiwara, 1995; Menn & Obler, 1990; Sasanuma, Kamio, & Kubota, 1990; Thompson, Shapiro, Tait, Jacobs, & Schneider, 1996; Thompson et al., 1997).

Consequently, different types of aphasia lead to specific expectations as regards the phenomenon of *that*-omission: (i) the performance of subjects with fluent aphasias(Wernicke's, anomic, conduction and transcortical sensory aphasia) may include embedded clauses, and thus may provide us with data to see how the phenomenon under consideration works in aphasic grammar, (ii) while we expect the performance of subjects with non-fluent aphasia (Broca's, transcortical motor and global aphasia) not to contain embedded clauses or keep the number of occurrences restricted to a minimum. However, it is the aim of this paper to give a general view of the phenomenon of *that*-omission across the board. Consequently, data from both types of aphasia, fluent and non-fluent, will be discussed to see whether *that* absence is as common in NBD subjects as it is in subjects with aphasia, and whether or not the degree of severity of the subordination deficit affecting the latter constrains the absence of *that* in embedded finite clauses.

METHODOLOGY

Subjects

In order to discover the characteristics of *that*-omission in English and how the phenomenon is manifested in the production of subjects diagnosed with aphasia, we carried out an analysis of spontaneous speech that included the performance of 200 individuals brought together by the AphasiaBank project (MacWhinney et al., 2011). Two groups were included in the study, an experimental group comprising 100 individuals diagnosed as aphasic according to the standards of the Western Aphasia Battery (WAB, Kertesz, 1982), and a control group including 100 non-brain damaged control subjects (NBDs).

The following corpora of subjects with aphasia were analysed: the Adler corpus (Szabo, Forbes, & Holland, 2008), the BU corpus (Hoover, 2012), the CMU corpus(MacWhinney, Forbes, & Fromm, 2008), the Elman corpus (Elman, Holland, & Forbes, 2009), the Fridriksson corpus (Fridriksson, Holland, & Forbes, 2011), the Garrett corpus(Garrett, 2011), the Kansas corpus (Jackson, 2008), the Kempler corpus (Kempler, 2008a), the Kurland corpus (Kurland, 2012) and the first 21 files of the Scale corpus (McCall, Holland, & Forbes, 2009). Exclusion criteria only affected those subjects that were not found to be aphasic according to WAB ($n = 8$), namely adler 03a, 07a, 22a, elman 04a, kansas 03a, 04a, 07a and scale 16a.

The sample includes 60 males, 27 females and 13 subjects for whom no information is provided as for gender. The mean age across deficits is 65.7 ranging from 36.0 to 91.9 years (information not available for 20 subjects). Fluent and non-fluent individuals are included in the study together with 15 subjects classified as aphasia without further specification. The distribution has been made explicit in Table 1. Individual data are included in Appendix A.

Three corpora of control data were analysed: the Capilouto corpus (Capilouto, 2008), the Kempler corpus (Kempler, 2008b) and the first 25 files of Wright corpus (Wright, 2008). The sample includes 48 males, 50 females and 2 subjects for whom no information is available (mean age: 69.7, range: 23.0–89.6 y.o.).

Corpus analysis

Regarding methodology, we looked for the occurrences of three verbs (*say*, *think* and *know*) that select finite complement clauses optionally introduced by *that*. Choosing only these three verbs was the option we considered best because these are the most frequent verbs used in colloquial speech which have this property. Moreover, the type of methodology used favours the occurrence of these three verbs. The analysed files

TABLE 1
Background information—experimental group

Aphasia type	*N°*	*Gender*	*Mean age (range)*
ANOMIC	27	17 Male 10 Female	61.5 (36.0–85.2) 1 No data available
CONDUCTION	17	12 Male 5 Female	61.10 (41.2–90.9)
WERNICKE	9	4 Male 5 Female	71.6 (52.5–91.9) 3 No data available
TRANSSENSORY	1	1 Female	57.8
BROCA	25	22 Male 3 Female	62.10 (35.11–85.5) 3 No data available
TRANSMOTOR	5	4 Male 1 Female	65.10 (54.7–75.6)
GLOBAL	1	1 Male	66.3
APHASIA	15	2 Female 13 No data available	78.9 13 No data available

Mean age: years; months.

were obtained by means of the AphasiaBank protocol that includes free speech samples (stroke story and coping, important event), picture descriptions (broken window, refused umbrella, cat rescue, flood), story narrative (Cinderella) and procedural discourse (how to make a sandwich).[1] With the exception of the stroke story, substituted in control subjects by an illness or injury story,[2] the protocol is invariable across groups.

Both quantitative and qualitative analyses were carried out. We left out of the analysis the cases listed below, as they provide no relevant information for the construction under analysis. Examples in (a–d) lack an embedding process, (e) and (f) entail further complexity than the one found in prototypical embedded finite clauses and (g) is an example of an unclear and, thus, unclassifiable structure.

(a) verbs (*say/know/think*) followed by a full stop:... I could almost tell you verbatim what people said. (capilouto35a, 662)
(b) verbs (*say/know/think*) followed by an element not equivalent to a clause:... but the stepmother said no. (capilouto58a, 1203)
(c) the parenthetical expressions *I think*, *you know*, *I'd say*:... they finally I think got back into Port au Prince there. (capilouto41a, 630)
(d) direct speech after relevant verb:... and I says uh must have woke up... (capilouto08a, 569)
(e) constructions involving wh-movement:... I stepped on what I thought was snow... (capilouto05a, 162)
(f) pseudo-clefts involving a BE + *that*:... all it said was that the ship... (capilouto59a, 996)
(g) unclear structures: . . . he said it that was doing it. (capilouto65a, 714)

However, uncontroversial attempts to produce a subordinate construction have been included even if the resulting structures were not fully grammatical.

When possible, findings were corroborated by non-parametric statistical analyses (conducted in SPSS 17.0). These comprised Mann–Whitney U tests to check for differences across two independent groups and Kruskal–Wallis H tests for comparisons of more than two independent groups. Differences across conditions were analysed with Friedman tests. Additionally, post-hoc analyses with Wilcoxon signed-rank tests with adjusted α (according to Bonferroni correction) were pursued when significant differences were found across conditions.

[1] The only exception is CMU01a, which includes the narration of pleasant and scary experiences together with something that caused a big impact on the subject, the description of the Rockwell and the Cookie theft pictures, and the story of The Three Bears (together with the stroke description, the Cinderella story and the process of making a sandwich).

[2] In the Wright corpus (Wright, 2008), in addition to the AphasiaBank protocol, the Wright protocol is also implemented. The latter includes concepts such as beach, birthday, directions, couple, holidays, weekend or vacation with and without picture support to elicit spontaneous speech.

RESULTS

Analysis of production in subjects with aphasia

The overall results of the 100 subjects with aphasia in our sample include a total number of 223 subordinate constructions (21.1% (n = 47) with the verb *say*, 61.4% (n = 137) with the verb *think* and 17.5% (n = 39) with the verb *know*). Out of these 223 structures, 85.2% (n = 190) were produced without the complementiser. Only 14.8% instances of *that* (n = 33) were documented. Significant differences were found between subordinate structures introduced by *that* and constructions without a *that* (Wilcoxon-signed rank test: $Z = -7.144$, $p = .000$). However, at the individual level, some discrepancies are observed. Scale17a produces not only more *that*s than any other subject but it is the only case where the number of overt *that*s is higher than its absence (see Appendix A).

The statistical analysis also reveals significant differences regarding the number of occurrences across conditions (*say* vs. *think* vs. *know*) in constructions without a *that* (Friedman test: $\chi 2(2) = 34.849$, df = 2, $p = .000$). These differences are neutralised in contexts with the overt presence of the complementiser (Friedman test: $\chi 2(2) = 0.388$, df = 2, $p = .824$). Post-hoc Wilcoxon signed-rank tests with Bonferroni corrections (α <0.016) revealed that differences only emerge with the verb *think* which was found to be the most productive verb as for introducing subordinate constructions without *that* in our control sample: *think* vs. *say* ($Z = –4.318$; $p = .000$), *think* vs. *know* ($Z = –5.113$; $p = .000$), *say* vs. *know* ($Z = –0.712$; $p = .476$). The results include the same number of occurrences of *say* and *think* in contexts where a subordinate clause is introduced by an overt *that* (n = 12).

However, as already noted in the introduction section, the performance of subjects with aphasia crucially depends on the specific diagnose. Consequently, we expect to find differences across fluent and non-fluent aphasias and quite a homogeneous behaviour within groups, despite the generally observed inter-subject variation in aphasic deficits. The raw data per group have been summarised in Table 2. Individual results are presented in Appendix A.

The results indicate that, while subjects with fluent aphasias consistently produce subordinate structures (n = 163), these are almost absent in non-fluent subjects (n = 8) (Mann–Whitney U test: $Z = -4.934$, $p = .000$). Nevertheless, utterances like the following were found in non-fluent aphasia production. Note that these constructions were not included in the analysis, as we explain in the exclusion criteria above:

(7) a. I know yes (adler13a, 748)
b. . . . I think for this . . . (adler16a, 181)

The use of *know* and *think* in (7) can be taken as an indicator of the fact that these subjects know the verbs that select *that*-clauses, but do not use them with embedded constructions. In addition, occurrences of *that* as a demonstrative, frequently attested in the performance of the non-fluent group, indicate that subjects have the capacity of producing this phonetic form.

A homogeneous behaviour is found across deficits classified in the non-fluent and in the fluent groups. Three types of aphasia classically classified as non-fluent are represented in this study, namely Broca's, transcortical motor and global aphasia. The results of the statistical analysis show no significant differences across these subjects (Kruskal–Wallis test: $\chi 2(2) = 1.593$, df = 2, $p = .451$). The group of fluent aphasias

TABLE 2
Summary of results across aphasia types and constructions

		Ø *That*			+ *That*		
Aphasia type	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
ANOMIC	90	14	52	9	5	7	3
CONDUCTION	35	10	18	5	0	2	0
WERNICKE	38	5	21	8	2	1	1
TRANSSENSORY	0	0	0	0	0	0	0
Total fluent	163	29	91	22	7	10	4
BROCA	5	0	4	1	0	0	0
TRANSMOTOR	3	0	2	1	0	0	0
GLOBAL	0	0	0	0	0	0	0
Total non-fluent	8	0	6	2	0	0	0
APHASIA	52	6	28	6	5	2	5
Total exp. subjects	223	35	125	30	12	12	9

includes Wernicke's, conduction, anomic and transcortical sensory aphasia. As in the case of non-fluent deficits, the contrast showed a similar pattern of performance across fluent deficits (Kruskal–Wallis test: $\chi 2(2) = 4.098$, df = 3, $p = .251$).

The results of the third group of subjects included in this study, labelled as aphasia in Table 2 since no specific diagnose is included in the AphasiaBank database, were also statistically analysed. Mann–Whitney U-tests show no significant differences with respect to the fluent group ($Z = -0.792$, $p = .429$) and significant differences with respect to the non-fluent group ($Z = -3.715$, $p = .000$). Consequently, the performance of this group will be discussed together with that of the fluent group.

Analysis of control production

In addition to subjects with aphasia, the results of 100 NBD subjects were also analysed. The overall results include a total number of 514 subordinate constructions (22.2% ($n = 114$) with the verb *say*, 57% ($n = 293$) with the verb *think* and 20.8% ($n = 107$) with the verb *know*). Out of these 514 structures, 78.4% ($n = 403$) were produced without the overt complementiser. Besides, 21.6% instances of *that* were documented ($n = 111$). The results per group have been summarised in Table 3. Individual data are presented in Appendix B.

TABLE 3
Summary of results across constructions

		Ø *That*			+ *That*		
Controls	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
Total controls	514	75	266	62	39	27	45

Significant differences were found between subordinate structures introduced by *that* and constructions of *that*-omission ($Z = -10.848$, $p = .000$). In addition, as for the experimental sample, the statistical analysis reveals significant differences regarding the number of occurrences across conditions in control subjects (*say* vs. *think* vs. *know*) in contexts without a *that* ($\chi 2(2) = 71.379$, df = 2, $p = .000$), which are neutralised in contexts with the overt presence of the complementiser ($\chi 2(2) = 2.218$, df = 2, $p = .330$). Post-hoc Wilcoxon signed-rank tests with Bonferroni corrections ($\alpha < 0.016$) revealed that differences only emerge with the verb *think* which was also found to be the most productive verb introducing subordinate constructions without *that* in our control sample: *think* vs. *say* ($Z = -6.402$; $p = .000$), *think* vs. *know* ($Z = -7.219$; $p = .000$), *say* vs. *know* ($Z = -1.047$; $p = .295$).

Experimental versus control results

As expected, significant differences were found in the number of occurrences of subordinate structures between the aphasia group and the NBD subjects (Mann–Whitney *U*-test: $Z = -7961$, $p = .000$). However, despite these asymmetries, subjects in the aphasia group and NBD subjects show very similar patterns in the distribution of their responses. This is illustrated in Figures 1 and 2, which include the distribution of occurrences across verbs and responses with and without *that*. We take this pattern to be the result of an essentially identical underlying structure for the verbs under consideration in the production of both subjects with aphasia and NBD subjects. This structure is what we take up in the following section.

AGRAMMATIC DATA AND THE *THAT*-INSERTION ACCOUNT

Interestingly, the data analysed in Section 5patterns with the data in the works cited in Sections 1 and 2: the high percentage of *that*-absence in both the speech of subjects with aphasia and NBDs indicate that the embedded finite clauses selected by *say*/*know*/*think* may well be regarded as selecting a bare TP in unmarked colloquial

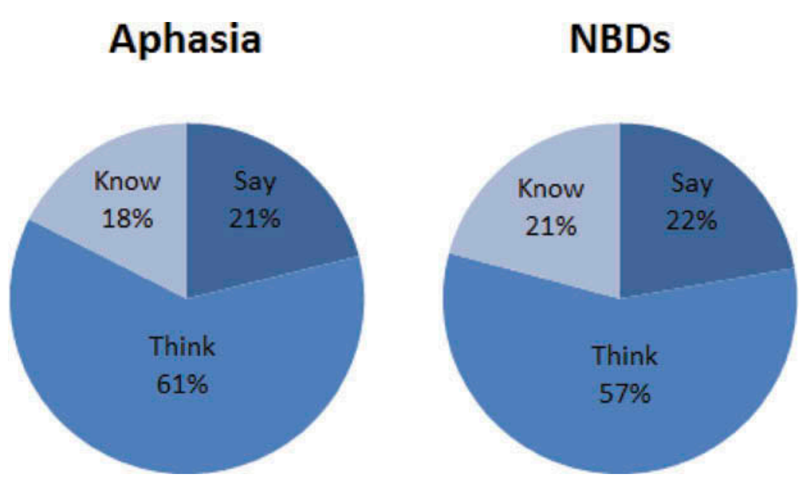

Figure 1. Distribution of responses across verbs.

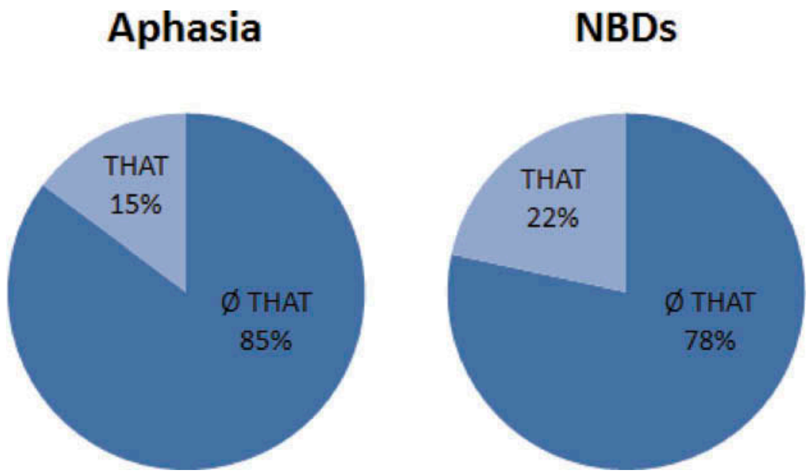

Figure 2. Distribution of responses with and without that.

style. We understand the type of task and context used to obtain the data in the corpora under examination as clearly and unambiguously non-formal, comparable in terms of degree of formality to the data analysed by Biber et al. (1999) in "conversational" registers or the everyday speech of mothers to their children (i.e., the data used to obtain percentages of *that*-absence in LLinàs-Grau and Fernández-Sánchez (in press)). The contrast between contexts of *that*-insertion and those without *that* is less evident in the case of non-fluent subjects due to the limited use of finite embeddings. However, the complete absence of [+that] constructions favours our analysis.

The verbs considered in this study take subordinate content clauses which can be introduced by a *that*. As we have seen in Section 2, there are certain contextual triggers that seem to be related to the presence of this element. Nevertheless, despite the high percentage of omission for the three verbs in conversational style, the verb *think* stands out as the least *that*-favouring verb. In Section 5.1, we saw how the number of subordinate constructions of subjects with aphasia is significantly higher for *think* ($n = 137$) than *say* ($n = 47$) or *know* ($n = 39$). This is also true for constructions without a *that* 91.2% with the verb *think*, 74.5 with *say* and 76.9 with *know*.

A similar pattern of occurrence is found with the analysis of the control data (see Section 5.2)where the verb *think* is significantly more frequent ($n = 293$) than the verb *say* ($n = 114$) and the verb *know* ($n = 107$) in contexts of embedded finite clauses. Again, *think* stands out as the most frequent form for introducing *that*-less clauses (90.8% of the total number of embeddings introduced by this verb) as compared with *say* (65.8%) and *know* (57.9%). In the control data, *think* is the verb which co-occurs with less instances of *that* ($n = 27$). Graphs 1 and 2 illustrate the overwhelming production of *think* without *that* in both aphasic participants and controls.

We understand the differences in production observed between the verb *think* and the other two verbs as a consequence of the type of task involved, which requires the subjects to provide opinions. Nevertheless, the fact that the preferred option is an embedded clause without *that* for all populations with this verb is indicative of the plausibility of the underlying TP analysis.

Aphasic data may provide useful clues for the analysis of the so-called *that*-omission phenomenon. As we mentioned in Section 3, and as illustrated by our results, aphasia affects the production of complex structures both in fluent and non-fluent deficits even though to a varying degree (Bastiaanse, 2011; Edwards, 2005; Thompson et al., 1996, 1997). While the mean use of embedded finite clauses reaches 5.14 per subject in the case of NBDs, it decreases to 3.12 in subjects with fluent deficits and to 0.26 in subjects with non-fluent deficits. Within groups, the statistical analysis reveals quite homogeneous behaviour despite the existence of individual variation—note that some of the subjects never produce the relevant constructions—and the diversity of syndromes analysed together under the labels "non-fluent" and "fluent"—especially in the latter group.

Previous studies, mostly focused on the characterisation of Broca's aphasia, appeal to structural considerations or operational deficits in order to account for problems in the CP layer. According to structural proposals, subjects with aphasia have problems projecting the syntactic tree up to its higher nodes (Friedmann, 2002; Hagiwara, 1995). Consequently, the left peripheral area of the tree is deleted from the representation, keeping the number of *wh*-questions and embeddings to a minimum in these subjects. Accounts based on impaired skills to perform language operations focus their attention on movement. Broca's patients have been found to experience difficulties with sentences derived through syntactic movement (Bastiaanse, Koekkoek & van Zonneveld, 2003; Friedmann & Shapiro, 2003; Grodzinsky, 1990, 2000), which would predict the poor performance with embeddings and *wh*-questions. All these theories are based on syntactic factors. However, since the presence of *that* in the constructions under analysis is not to be found in syntax but is plausibly related to use (see Section 2), no differences between individuals with and without aphasia are to be expected.

Despite the low occurrence of embedded clauses in our non-fluent sample, the overall production of constructions relevant for our analysis is high ($n = 223$). Moreover this production clearly indicates an imbalance between the contexts with and without *that*, the two options in (2), repeated here as (8), with a clear preference for *that*-absence.

(8) a. I think that the weather is changing.
b. I think the weather is changing.

The analysis we assume for constructions without *that* is that the relevant verbs select a bare-TP and not a CP structure, as explained in Section 1. As a consequence, there is no real *that*-omission, but rather *that*-insertion, which is triggered by contextual cues. We temptatively conclude, thus, that aphasic data provide evidence for the adequacy of this account.

Nevertheless, there are differences that must be noted between NBD and aphasic production. As was explained in Section 2, one of the factors that favour *that*-insertion is non-adjacency of the selecting verb and its clause. Our data include some examples of this, as in (9) or (10), but they are scarce and cannot be compared to those of the controls (11)–(14):

(9) but the.... later he..... fairy said well that she must get outa home.... (Kansas 11a, 1602)
(10) but I know (...) that they tell they their.... (kurland 03b, 770)

These examples incorporate an element (*well*) or a pause between the verb *say* and *know* and the clause that they select but these are not parentheticals, which we do find in control data:

(11) I know for a fact that it hurt for fifty one weeks and two days (capiloutto 05a,224)
(12) and so I said to her in French that I was sorry it had been a long time since I had studied and spoken French... (capiloutto 07a, 345)
(13) and so the pastor said the next day that he wanted to take.... (capiloutto 41a, 558)
(14) and I thought at the time that a heart attack was possible... (capiloutto 50a, 175)

Thus, the analysis of our data does not allow us to conclude that non-adjancency is a conclusive cue to insertion in aphasic production.

CONCLUSION

The number of occurrences of subordinate clauses differs in the production of subjects with aphasia and NBD subjects. Differences are mainly, but not solely, attributable to the lower occurrence of subordinate constructions in non-fluent subjects. However, the comparison across groups provides very interesting results. First, our results stand in favour of characterisations of fluent deficits that acknowledge reduction of syntactic complexity in this group of subjects (Bastiaanse, 2011; Edwards, 2005; among others). Second, and more importantly for the purpose of this paper, the pattern observed as regards *that*-presence vs. *that*-absence coincides, with the latter as the prevalent option across groups. On the basis of the attested difficulty with subordination in subjects diagnosed with aphasia, we suggest that the data can be accounted for by taking the underlying structure of *know*, *say* and *think*, one which lacks a proper CP in-line with the proposals by Franks (2005) and LLinàs-Grau and Fernández-Sánchez (in press).

Nevertheless, the analysis of the presence of *that* as a result of insertion related to contextual cues cannot be conclusively tested with the data considered in this article essentially because the observed triggering cues in NBD data are not found in the sample analysed. More specifically. the data in this article are associated to a colloquial register, which favours *that*-absence, the construction that emerges as most frequent.

As a final observation, we can conclude that since the presence of *that* is not directly related to syntax, the component impaired in aphasic individuals, the frequency of *that*-insertion is not expected to be essentially different from the one found in NBD subjects. In this light, the similarity in the pattern observed between aphasic and control production may be taken as an indication that our account is in the right direction.

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APPENDIX A

TABLE A1
Individual data—subjects with aphasia

					Ø That			*+ That*		
Aphasia type	*Subject*	*Gender*	*Age*	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
			M							
ANOMIC	adler 01a	Male	58.11	5	0	3	1	0	1	0
(*n* = 27)	adler 08a	Male	56.9	1	0	0	0	1	0	0
	adler 09a	Female	41.8	1	0	0	0	0	0	1
	adler 12a	Female	40.7	6	1	4	1	0	0	0
	adler 15a	Male	78.11	3	1	2	0	0	0	0
	adler 17a	Male	85.2	14	1	13	0	0	0	0
	adler 20a	Male	75.8	0	0	0	0	0	0	0
	adler 21a	Male	36.0	0	0	0	0	0	0	0
	adler 24a	Male	65.2	0	0	0	0	0	0	0
	BU 03a	Male	58.8	0	0	0	0	0	0	0
	cmu 03a	Female	83.2	2	0	2	0	0	0	0
	elman 05a	Male	48.2	4	0	2	2	0	0	0
	elman 07a	Male	65.6	1	1	0	0	0	0	0
	elman10a	Female	59.6	2	0	1	0	0	1	0

(*Continued*)

TABLE A1
(Continued)

					Ø *That*			+ *That*		
Aphasia type	*Subject*	*Gender*	*Age*	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
	elman 13a	Male	76.8	2	1	0	0	1	0	0
	fridriksson 04a	Male	*	3	1	2	0	0	0	0
	fridriksson 05a	Female	58.3	3	3	0	0	0	0	0
	kansas 11a	Female	66.0	20	2	14	2	2	0	0
	kansas 15a	Male	69.9	6	1	4	0	0	0	1
	kansas 18a	Female	69.0	3	1	0	1	0	1	0
	kansas 19a	Female	66.1	1	0	1	0	0	0	0
	kempler 02a	Female	55.0	0	0	0	0	0	0	0
	scale 02a	Male	57.6	0	0	0	0	0	0	0
	scale 02b	Male	58.6	0	0	0	0	0	0	0
	scale 08a	Male	72.10	0	0	0	0	0	0	0
	scale 14a	Male	63.8	2	0	1	1	0	0	0
	scale 17a	Female	54.2	11	1	3	1	1	4	1
CONDUCTION	adler 02a	Male	69.9	2	2	0	0	0	0	0
($n = 17$)	adler 05a	Female	68.2	2	1	0	1	0	0	0
	adler 14a	Male	71.4	6	1	3	2	0	0	0
	BU 06a	Male	52.5	0	0	0	0	0	0	0
	elman 01a	Male	55.7	4	1	3	0	0	0	0
	elman 02a	Female	81.11	2	2	0	0	0	0	0
	fridriksson13a	Male	55.4	0	0	0	0	0	0	0
	kansas 10a	Male	77.0	1	1	0	0	0	0	0
	kansas 13a	Female	43.8	1	0	1	0	0	0	0
	kansas 20a	Male	55.11	6	0	5	1	0	0	0
	kansas 21a	Male	60.11	2	1	0	0	0	1	0
	scale 04a	Female	52.10	0	0	0	0	0	0	0
	scale 06a	Male	41.2	2	0	1	1	0	0	0
	scale 06b	Male	42.2	1	0	1	0	0	0	0
	scale 11a	Female	90.9	6	1	4	0	0	1	0
	scale 13a	Male	70.2	0	0	0	0	0	0	0
	scale 15a	Male	58.4	0	0	0	0	0	0	0
WERNICKE	adler 06a	Male	70.7	1	0	1	0	0	0	0
($n = 9$)	adler 23a	Male	81.3	10	0	5	3	1	1	0
	elman 12a	Male	57.4	6	0	5	1	0	0	0
	elman 14a	Female	76.3	8	3	4	1	0	0	0
	garrett 01a	Female	52.5	4	1	1	1	0	0	1
	kansas 05a	Female	*	1	0	1	0	0	0	0
	kansas 12a	Male	*	0	0	0	0	0	0	0
	kansas 14a	Female	*	5	1	2	1	1	0	0
	scale 11b	Female	91.9	3	0	2	1	0	0	0
T. SENSORY ($n = 1$)	scale12a	Female	57.8	0	0	0	0	0	0	0
BROCA	adler 10a	Male	44.8	0	0	0	0	0	0	0
($n = 25$)	adler 11a	Male	80.11	0	0	0	0	0	0	0
	adler 13a	Male	52.4	0	0	0	0	0	0	0
	adler 16a	Male	63.3	0	0	0	0	0	0	0
	adler 19a	Male	81.0	0	0	0	0	0	0	0
	adler 25a	Male	66.2	0	0	0	0	0	0	0
	cmu02a	Male	35.11	0	0	0	0	0	0	0
	elman 03a	Male	55.2	1	0	1	0	0	0	0
	elman 06a	Female	76.11	1	0	1	0	0	0	0

(*Continued*)

TABLE A1
(Continued)

					Ø That			+ That		
Aphasia type	*Subject*	*Gender*	*Age*	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
	elman 08a	Male	71.6	1	0	1	0	0	0	0
	elman 09a	Female	58.10	0	0	0	0	0	0	0
	elman 11a	Male	52.2	1	0	1	0	0	0	0
	kansas 01a	Male	85.5	0	0	0	0	0	0	0
	kansas 02a	Male	66.11	0	0	0	0	0	0	0
	kansas 06a	Male	*	0	0	0	0	0	0	0
	kansas 08a	Male	*	0	0	0	0	0	0	0
	kansas 09a	Male	57.2	0	0	0	0	0	0	0
	kansas 16a	Male	63.3	0	0	0	0	0	0	0
	kempler 03a	Male	64.6	0	0	0	0	0	0	0
	kempler 04a	Female	60.4	1	0	0	1	0	0	0
	scale 01a	Male	78.5	0	0	0	0	0	0	0
	scale 03a	Male	52.10	0	0	0	0	0	0	0
	scale 07a	Male	70.11	0	0	0	0	0	0	0
	scale 10a	Male	44.9	0	0	0	0	0	0	0
	scale 15b	Male	59.4	0	0	0	0	0	0	0
T. MOTOR	adler 04a	Female	75.6	1	0	1	0	0	0	0
($n = 5$)	adler 18a	Male	71.6	0	0	0	0	0	0	0
	kansas 17a	Male	54.7	2	0	1	1	0	0	0
	scale 05a	Male	63.8	0	0	0	0	0	0	0
	scale 05b	Male	42.2	0	0	0	0	0	0	0
GLOBAL ($n = 1$)	scale 09a	Male	66.3	0	0	0	0	0	0	0
APHASIA	cmu 01a	Female	78.9	3	0	1	1	0	1	0
($n = 15$)	cmu 01b	Female	78.9	7	0	6	0	1	0	0
	kurland 01b	*	*	2	1	1	0	0	0	0
	kurland 02a	*	*	0	0	0	0	0	0	0
	kurland 02b	*	*	0	0	0	0	0	0	0
	kurland 03a	*	*	3	0	2	0	0	0	1
	kurland 03b	*	*	6	2	1	1	1	0	1
	kurland 04a	*	*	0	0	0	0	0	0	0
	kurland 04b	*	*	3	0	2	0	0	1	0
	kurland 05a	*	*	9	0	6	1	1	0	1
	kurland 05b	*	*	6	2	2	2	0	0	0
	kurland 06a	*	*	7	1	3	0	1	0	2
	kurland 06b	*	*	6	0	4	1	1	0	0
	kurland 08a	*	*	0	0	0	0	0	0	0
	kurland 12a	*	*	0	0	0	0	0	0	0

APPENDIX B

TABLE B1
Individual data—NBD subjects

					Ø That			*+ That*		
Controls	*Subject*	*Gender*	*Age*	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
Control	capilouto 01a	Female	80.6	6	1	1	2	0	1	1
($n = 100$)	capilouto 02a	Male	85.2	4	0	1	2	0	0	1
	capilouto 03a	Female	75.0	6	1	3	0	0	0	2
	capilouto 04a	Female	80.6	1	1	0	0	0	0	0
	capilouto 05a	Male	72.3	3	0	0	1	1	0	1
	capilouto 06a	Female	82.4	4	1	3	0	0	0	0
	capilouto 07a	Female	72.0	4	3	0	0	1	0	0
	capilouto 08a	Male	74.0	7	2	3	0	1	0	1
	capilouto 09a	Male	82.7	2	1	1	0	0	0	0
	capilouto 10a	Male	72.11	4	3	0	1	0	0	1
	capilouto 11a	Male	53.5	8	1	1	2	1	1	2
	capilouto 12a	Female	54.11	4	0	2	2	0	0	0
	capilouto 13a	Female	71.5	2	0	1	0	0	0	1
	capilouto 14a	Male	81.1	0	0	0	0	0	0	0
	capilouto 15a	Male	71.10	6	0	3	2	0	0	1
	capilouto 16a	Female	79.11	4	0	3	1	0	0	0
	capilouto 17a	Female	71.3	9	0	9	0	0	0	0
	capilouto 18a	Female	64.4	6	1	5	0	0	0	0
	capilouto 19a	Male	60.9	1	0	1	0	0	0	0
	capilouto 20a	Female	71.6	6	0	2	2	1	1	0
	capilouto 21a	Male	74.6	3	1	2	0	0	0	0
	capilouto 22a	Female	76.0	8	0	6	1	0	1	0
	capilouto 23a	Male	70.6	1	1	0	0	0	0	0
	capilouto 24a	Male	70.8	3	2	1	0	0	0	0
	capilouto 25a	Female	71.5	19	5	8	4	1	1	0
	capilouto 26a	Male	77.0	2	1	1	0	0	0	0
	capilouto 27a	Female	70.2	12	2	4	3	1	2	0
	capilouto 28a	Male	76.9	6	1	4	1	0	0	0
	capilouto 29a	Male	71.6	5	1	3	0	1	0	0
	capilouto 30a	Male	74.5	2	0	1	0	1	0	0
	capilouto 31a	Female	72.2	9	0	8	0	1	0	0
	capilouto 32a	Female	80.1	8	0	5	0	0	1	2
	capilouto 33a	Female	71.8	13	0	9	0	1	2	0
	capilouto 34a	Male	71.3	0	0	0	0	0	0	0
	capilouto 35a	Male	75.11	1	0	0	1	0	0	0
	capilouto 36a	Male	80.1	1	0	1	0	0	0	0
	capilouto 37a	Male	70.11	3	0	3	0	0	0	0
	capilouto 38a	Male	70.10	2	0	2	0	0	0	0
	capilouto 39a	Male	78.7	4	0	2	0	0	2	0
	capilouto 40a	Male	71.7	5	0	3	1	0	0	1
	capilouto 41a	Female	77.9	9	2	5	1	1	0	0
	capilouto 42a	Female	73.6	7	0	4	1	1	1	0
	capilouto 43a	Male	72.6	6	1	4	1	0	0	0
	capilouto 44a	Male	70.9	19	0	5	4	1	1	8
	capilouto 45a	Female	71.4	5	0	3	0	0	0	2
	capilouto 46a	Male	73.9	1	0	1	0	0	0	0
	capilouto 47a	Female	70.9	1	0	1	0	0	0	0
	capilouto 48a	Male	71.5	6	2	4	0	0	0	0

(*Continued*)

TABLE B1
(Continued)

					Ø That			+ That		
Controls	*Subject*	*Gender*	*Age*	*Total*	*Say*	*Think*	*Know*	*Say*	*Think*	*Know*
	capilouto 49a	Male	73.7	4	0	4	0	0	0	0
	capilouto 50a	Male	73.6	7	2	1	2	0	1	1
	capilouto 51a	Male	82.5	3	2	0	0	1	0	0
	capilouto 52a	Female	81.2	1	0	0	0	0	1	0
	capilouto 53a	Male	86.8	5	0	3	1	0	1	0
	capilouto 54a	Male	83.2	0	0	0	0	0	0	0
	capilouto 55a	Female	85.10	9	0	5	0	1	0	3
	capilouto 56a	Female	86.9	5	0	5	0	0	0	0
	capilouto 57a	Female	82.5	11	2	7	1	1	0	0
	capilouto 58a	Female	78.9	6	2	3	1	0	0	0
	capilouto 59a	Male	81.2	10	1	5	3	1	0	0
	capilouto 60a	Male	86.4	6	2	3	0	0	0	1
	capilouto 61a	Male	81.0	4	1	1	1	0	1	0
	capilouto 62a	Female	81.6	13	5	3	1	2	0	2
	capilouto 63a	Female	86.6	2	1	0	0	1	0	0
	capilouto 64a	Female	81.2	5	1	1	0	0	0	3
	capilouto 65a	Male	89.6	12	2	8	2	0	0	0
	capilouto 66a	Male	85.1	6	1	3	1	0	1	0
	capilouto 67a	Male	82.8	5	3	1	0	1	0	0
	capilouto 68a	Male	71.6	4	0	2	1	0	0	1
	capitoulo 76a	*	*	4	0	4	0	0	0	0
	capitoulo 77a	Female	86.4	1	0	1	0	0	0	0
	capitoulo 78a	Male	84.4	1	0	1	0	0	0	0
	capitoulo 79a	Male	83.0	3	0	3	0	0	0	0
	capilouto 80a	Male	84.0	2	0	2	0	0	0	0
	capilouto 81a	*	*	1	0	0	1	0	0	0
	kempler 01a	Female	75.7	2	1	1	0	0	0	0
	wright 03a	Female	76.0	0	0	0	0	0	0	0
	wright 04a	Female	74.8	17	0	11	2	3	1	0
	wright 05a	Female	78.11	4	1	2	1	0	0	0
	wright 06a	Female	65.1	1	0	0	0	0	0	1
	wright 07a	Female	51.6	5	0	4	0	1	0	0
	wright 11a	Female	33.8	5	1	2	0	1	1	0
	wright 12a	Female	36.10	6	2	4	0	0	0	0
	wright 13a	Male	23.3	11	2	7	1	0	1	0
	wright 14a	Male	23.0	10	2	6	1	0	0	1
	wright 15a	Male	31.9	8	1	3	1	1	0	2
	wright 16a	Female	32.4	0	0	0	0	0	0	0
	wright 17a	Female	66.1	4	1	2	0	1	0	0
	wright 18a	Female	68.0	6	0	2	0	1	3	0
	wright 19a	Male	57.6	2	0	1	1	0	0	0
	wright 20a	Female	70.9	6	1	4	1	0	0	0
	wright 22a	Female	33.9	1	0	0	0	0	0	1
	wright 24a	Female	45.1	1	0	0	1	0	0	0
	wright 26a	Female	58.7	4	0	2	1	1	0	0
	wright 27a	Female	50.8	6	0	5	1	0	0	0
	wright 28a	Female	62.6	12	0	4	2	5	0	1
	wright 29a	Male	67.2	13	1	8	1	0	0	3
	wright 30a	Female	40.2	4	2	2	0	0	0	0
	wright 31a	Male	45.7	0	0	0	0	0	0	0
	wright 32a	Female	46.8	2	1	0	0	0	0	1
	wright 33a	Female	29.11	6	0	1	0	3	2	0