

Translation between L2 Acquisition and L1 Attrition: Anaphora Resolution in Italian by English-Italian Trainee Translators

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Paper to appear in *Applied Linguistics*.

<http://applij.oxfordjournals.org/content/early/2014/12/09/applin.amu070.abstract>

doi:10.1093/applin/amu070

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Translation between L2 Acquisition and L1 Attrition: Anaphora Resolution in Italian by English-Italian Trainee Translators

This paper reports on the findings of an empirical study that relates translation studies and research on language acquisition/attrition by looking at the interpretation of overt pronominal subjects, previously found to be problematic in both domains. The focus is on the resolution of intra-sentential anaphora and cataphora in Italian by two groups of native speakers, English-Italian trainee translators and a control group of non-translators. The participants did a picture selection task in which they had to identify the antecedents of third person null and overt subject pronouns in ambiguous anaphoric and cataphoric conditions. Contrary to what was expected based on previous work, proposing that translators undergo a form of first language attrition due to extended exposure to a second language, trainee translators did not exhibit evidence of overt pronoun overgeneralization (that is, second language influence). In fact, they selected pragmatically inappropriate antecedents to a lesser extent than the control group, leading to the conclusion that in language comprehension, metalinguistic awareness can override other influences affecting translators.

INTRODUCTION

The disciplines of translation studies and bilingualism research share a common interest in linguistic systems and processes marked by interplay of two languages. Translation studies give much attention to comparisons of the linguistic properties of translated and non-translated texts, with the goal of identifying the distinctive features of translations and the exact ways in which they diverge from texts originally produced in the same language. This attention arose out of the long-standing intuition that translations represent a special subset of the target language system, clearly expressed in labels such as *translationese* (Gellerstam 1986). Similarly, research on bilingualism looks at the differences between the language used by bilingual populations – simultaneous bilinguals, second language (L2) learners, and first language (L1) attriters – and monolingual native speakers. Here particular focus is placed on *interlanguage* (Selinker 1972) and attrited language, both seen as distinct from the native norm. The ‘specialness’ of translations and interlanguage/attrited language is attributed to contact and interference between the particular languages (target and source, L1 and L2) on the one hand, and to tendencies characteristic of translation or bilingualism in general on the other. Both translated and L2 texts have, for instance, been found to be more lexically and syntactically explicit than comparable non-translated L1 texts, regardless of the language combination (see e.g. Blum-Kulka 1986).

Despite these commonalities, the two disciplines have developed, for the most part, independently of each other. Only rare studies, such as Blum-Kulka’s, make direct

comparisons between the properties of translational and learner language, while studies comparing the translators' internal linguistic system to that of other bilinguals are almost completely lacking. A notable partial exception is the work of Cardinaletti (2004; 2005) and Giusti (2004), who relate the linguistic system of translators to that of L1 attriters. Based on features detected in published translations into Italian – especially the overuse of overt subject pronouns (Cardinaletti 2004; 2005), atypical preverbal subject placement and atypical choice of dative pronouns (Giusti 2004; Cardinaletti 2004; 2005) – these authors have argued that translators undergo a form of language attrition, in which the knowledge of their mother tongue (the target language of translation) becomes partly modified due to the prolonged influence of an L2 (the source language of translation). In this perspective, what in translation studies is identified as 'translationese' is seen as a sign of a change in the translators' mental grammar, although this claim still awaits experimental verification.

The aim of the present paper is to contribute to this strand of research by investigating anaphora resolution in Italian by translators. Anaphora resolution seems like a particularly suitable phenomenon to study in this context due to the fact that the use and interpretation of Italian null and overt pronominal subjects has been dealt with extensively in translation studies and bilingualism research. In particular, a number of experimental studies have looked at subject pronoun interpretation by a range of bilingual populations, providing a solid reference point for translator data to be compared with.

We report the results of an empirical study that involved trainee English-Italian translators. The study used a picture selection task in which the participants were asked to identify the antecedents of null and overt subject pronouns in intra-sentential anaphoric and cataphoric contexts. Based on findings from previous research, and in particular the 'translation-as-attrition' claim mentioned above, we expected to find instances of overgeneralization of overt subject pronouns on the part of trainee translators. As the results will show, however, this hypothesis was not confirmed. We discuss possible reasons for the obtained outcome, underlining the need for further studies that will also include experienced translators, and emphasising the importance of linguistic training, possibly the key factor that makes translators different from 'ordinary' L2 learners and L1 attriters. We also call for future studies based on production and translation tasks, needed in order to test the full range of translators' use of their L1, both outside and during translation activities, and to fully examine the alternative hypothesis that the overuse of overt subjects results from the translation process itself, while the translators' mental grammar remains intact.

Before presenting the study itself, we outline the relevant properties of the languages involved, and provide a review of previous studies on null and overt subject pronouns in bilingual language development and translation, with particular reference to Italian.

PRONOMINAL SUBJECTS IN ITALIAN AND ENGLISH

Italian is a null-subject language, i.e. it permits the omission of referential arguments in the preverbal subject position of finite clauses. Its pronominal subjects can thus be realized as null or overt; which of the two options will be used mostly depends on discourse-pragmatic factors: subjects co-referential with topical antecedents are typically expressed by null pronouns, while subjects referring to non-topical antecedents are normally realized as overt pronouns. This is illustrated in (1): the null pronoun (*pro*) in the second sentence can only refer to the topical antecedent (Maria); the overt pronoun, on the other hand, is more likely to be linked to a different female referent, known from the wider context.

- (1) *Maria_i si è iscritta a linguistica. Pro_{i/*j}/lei_{#i/j} è contenta.*
Maria REFL is enrolled to linguistics *pro* / she is happy
'Maria enrolled to study linguistics. She is happy.'

A similar division of labour between the two types of pronouns obtains in intra-sentential anaphoric contexts. With regard to such contexts, Carminati (2002) proposed the Position of Antecedent Strategy (PAS), stating that Italian null and overt subject pronouns prefer antecedents in different syntactic positions: while the null pronoun prefers an antecedent in the subject position (which is typically co-referential with the discourse topic), the overt pronoun prefers an antecedent in a non-subject position. Different antecedent preferences of null and overt subject pronouns in complex bi-clausal sentences are illustrated in (2): the null subject of the subordinate clause is more likely to refer to the subject of the main clause ('Luigi') than to its object ('Pietro'); the overt subject, on the other hand, is more biased towards the object.¹ The overt pronoun can also refer to an extra-sentential antecedent, mentioned in previous discourse.

- (2) *Luigi_i chiama Pietro_j mentre pro_{i/?j}/lui_{?i/j/k} guarda la tivù.*
Luigi calls Pietro while *pro* / he is watching the TV
'Luigi calls Pietro while he is watching TV.'

The PAS is conceived as a principle applied during on-line sentence processing, and as such it is affected by the linear order in which the pronoun appears with respect to its potential antecedents. Potential referents can either precede the pronoun (anaphora), as in (2) above, or they can follow it (cataphora), the case illustrated in (3). The latter order is more demanding for the processor, as the pronoun is encountered before its possible referents, and due to referent unavailability there are no discourse constraints on antecedent assignment (see Sorace and Filiaci 2006: 349). It is thus expected that in the case of overt cataphoric pronouns a conflict might arise between the PAS, requiring a non-subject antecedent, and a more general processing preference for completing the pronoun-antecedent dependency as quickly as possible (Van Gompel and Liversedge 2003).

- (3) *Mentre pro_{i/?j}/lui_{i/j/k} guarda la tivù, Luigi_i chiama Pietro_j.*
while *pro* / he is.watching the TV Luigi calls Pietro
'While he is watching TV, Luigi calls Pietro.'

Another consequence of the PAS being a processing principle is that its violations normally lead to discourse-pragmatic inappropriateness rather than ungrammaticality.

Finally, the situation in English is fairly straightforward. English is a non-null-subject language, so overt subjects are required in all contexts and there is no choice of pronominal forms regulated by discourse-pragmatic conditions.

PRONOMINAL SUBJECTS IN BILINGUALISM AND TRANSLATION

Anaphora resolution in bilingual language development

The referential properties of pronominal subjects have been shown to present difficulties in different types of bilingual development, including bilingual L1 acquisition, adult L2 acquisition and L1 attrition. Converging evidence from a number of studies points to an asymmetrical acquisition pattern of null and overt subject pronouns, with overt pronouns consistently more problematic than null pronouns; specifically, highly proficient bilinguals tend to overgeneralize overt pronouns to contexts that require the use of null pronouns by producing and accepting overt pronouns that refer to topical antecedents (see Lozano 2009 for Spanish, and the studies cited below for Italian).

Of particular importance for the present paper is a group of studies that looked at the interpretation of Italian subject pronouns in ambiguous intra-sentential contexts by using (a version of) the picture selection task (PST) originally designed by Tsimpli *et al.* (2004). In

Tsimplici *et al.*'s study, which focused on L1 attrition, the task was administered to a group of potentially attrited L1 Italian near-native speakers of English, and a control group of monolingual Italian native speakers. The task included 20 complex sentences featuring an anaphoric or cataphoric null or overt pronoun in the subordinate clause. The main clause contained two same-gender NP referents which matched the overt pronoun in gender, leading to antecedent ambiguity (similar to examples 2 and 3 above). Each sentence was accompanied by three pictures, showing the matrix subject, the matrix object or an extra-linguistic referent as the agent of the action described in the subordinate clause. Participants were asked to indicate all the pictures that matched the meaning of the sentence, thereby identifying all possible antecedents of the pronoun. Compared to the monolingual controls, the attriters showed a higher tendency to interpret the overt pronoun as co-referential with the matrix subject, in both anaphoric and cataphoric conditions. Furthermore, with cataphoric overt pronouns, attrition effects were also manifested in that the bilinguals showed no clear antecedent preference, in contrast to the controls, who preferred the extra-linguistic referent. The two subject groups did not differ in their interpretation of the null pronoun in either anaphora or cataphora.

In the domain of L2 acquisition, the same PST was used in studies conducted by Sorace and Filiaci (2006) and Belletti *et al.* (2007), involving L1 English near-native speakers of Italian. In both studies the L2 learners interpreted the null pronoun in a native-like way. However, they proved more inclined than the native speakers to interpret the overt pronoun as co-referential with the matrix subject. Moreover, in the cataphoric condition they preferred the matrix subject to the other two antecedents, while the native speakers predominantly chose the extra-linguistic referent.

An aural version of Tsimplici *et al.*'s task was also used in a study on simultaneous bilingualism by Serratrice (2007). This study involved bilingual English-Italian children (mean age 8;2), monolingual Italian-speaking children (mean age 8;6) and monolingual Italian-speaking adults. The three participant groups interpreted the null pronouns in essentially the same way, but several differences emerged for the overt pronouns. In the case of anaphora, the bilinguals established co-reference between the subject antecedent and the overt pronoun more often than either group of monolinguals, while for cataphora they patterned with the monolingual children in selecting this interpretation more often than the adults. The two groups of children also considered the extra-linguistic referent as a possible antecedent for the cataphoric overt pronoun less often than the monolingual adults.

The observed non-target-like patterns of interpretation of overt subject pronouns on the part of bilinguals served as a basis for the Interface Hypothesis (Sorace and Filiaci 2006; Sorace 2011), according to which structures involving an interface between syntax and another cognitive domain (such as discourse-pragmatics) may not be fully acquired in L2 acquisition, are acquired late in simultaneous bilingualism, and are subject to loss in L1 attrition, unlike structures belonging to the domain of narrow syntax. The causes leading to this remain in part unclear: it has been suggested that bilinguals have sub-optimal processing abilities compared to monolinguals; however, the language combination and the resulting cross-linguistic influence have also been shown to play a major role. While in the above studies English, a non-null-subject language, is likely to have influenced the interpretation of overt pronominal subjects in Italian, entirely different results were obtained by Author (XXXX), who looked at near-native speakers of Italian whose mother tongue was Croatian, another null-subject language. In this case, fully native-like patterns of interpretation by the near-native speakers of both null and overt subject pronouns were revealed.

Lastly, the described asymmetry between null and overt subjects is in line with the well-documented finding of functional approaches to language acquisition, namely that L2 learners tend to have problems with the marking of topic continuity. Post-beginner learners of different languages have been found to overmark non-topical referents, by producing full NPs instead of pronominal forms, and in *pro*-drop languages also by using overt rather than null pronouns (Givón 1984; Arenholz 2004; Chini 2004, among others). This ‘overexplicitness’ has mostly been interpreted as characteristic of a universal lexical stage in the progressive grammaticalization of interlanguage, but the role of language-specific factors is also acknowledged, as different language combinations lead to somewhat different patterns.

The use of pronominal subjects in translation

Multiple studies have reported an overuse of overt pronominal subjects in texts translated into null-subject languages. Focusing on Italian, particularly interesting results were obtained by Baroni and Bernardini (2006), who compared translated (from different source languages) and non-translated Italian articles from a geopolitics journal. In addition to a higher frequency of non-clitic personal pronouns in translated texts (0.49% vs. 0.35% in non-translated texts), these authors found that the performance of the automatic translation identifier they tested dropped significantly when stressed pronouns were removed, indicating that pronoun overuse is an important distinguishing feature of translations. This finding was also confirmed by

human judges, some of whom listed the number of overt pronominal subjects as a significant translation cue.

Pronominal subjects in translated Italian have also been studied from the perspective of the Interface Hypothesis. Cardinaletti (2004; 2005) established that in translations from English and German (two non-null-subject languages) overt pronominal subjects are occasionally used in contexts in which they would normally be omitted in Italian spontaneous production, as in the example reproduced in (4) (from Cardinaletti 2004: 137).

- (4) a. [...] *he knew that if he screwed up his face and wailed, his mother would give him anything he wanted (HP, 22).*²
b. [...] *sapeva che se contorceva la faccia e si lagnava la madre gli avrebbe dato qualsiasi cosa lui avesse chiesto (HP, 26).*

Based on this and similar examples, Cardinaletti (2005) argues that the L1 system of translators becomes partially modified due to prolonged contact with an L2 (the source language of translation), meaning that translators undergo a form of L1 attrition; specifically, she claims that the modifications only concern interface phenomena. Her conclusions are based on a qualitative analysis of a small set of examples extracted from translations of two English and one German novel (*Harry Potter and the Philosopher's Stone*, James Joyce's *Dubliners*, and *Homo Faber* by Max Frisch; see Cardinaletti 2004: 135-138, Cardinaletti 2005: 62); no information is provided about the length of professional experience of the translators of the studied books. The author herself acknowledges (Cardinaletti 2004: 139; 2005: 75) that a stronger claim about translators being affected by language attrition could only be made based on data obtained in psycholinguistically oriented tasks, i.e. the same type of tasks used in acquisitional studies such as those reviewed above.

Other explanations of overt pronoun overuse that have been proposed by translation studies scholars predominantly rely on source language influence, along the lines of Santos' (1995) claim that if an optional marker in the target language corresponds to an obligatory marker in the source language, its frequency is expected to increase in translationese. Another widely entertained idea is that of overt pronoun overuse being an instance of *explicitation*, the tendency of target texts of translation to state the information more explicitly than the original. However, although explicitation is considered to be characteristic of translation in general, in this particular case it is mostly perceived as tightly related to cross-linguistic influence (see Castagnoli 2009 for a more detailed review). In other words, most proposals

see overt pronoun overuse as resulting directly from the translation process; in fact, given the product-based nature of her analysis, Cardinaletti herself admits to the possibility of ‘temporary attrition’, i.e. to pronoun overuse being related to the process of translating (2004: 139; 2005: 75–76).

THE STUDY

Aims and predictions

The aim of our study was to investigate the interpretation of pronominal subjects by trainee translators, using an experimental task that provides an insight into their internal linguistic system more directly than translated texts.³ We looked at two well-studied languages, Italian and English, with the goal of verifying if a pattern that is well-attested with different types of bilinguals would also be discovered with translators, supporting the claim that they undergo a form of L1 attrition.

We focused on the interpretation of Italian null and overt subject pronouns in ambiguous complex bi-clausal sentences in which the pronoun is in the subordinate clause. Based on Carminati’s PAS and the results of previous research, we predicted that both controls and translators would show a tendency to select the matrix subject as the antecedent of anaphoric and cataphoric null pronouns. For the overt pronouns, in the anaphoric condition we expected both groups to prevalently select the matrix complement; in the cataphoric condition we expected the controls to prefer an extra-linguistic referent, and the translators not to show a strong preference for any of the choices. We also hypothesized that translators would interpret overt pronouns as co-referential with the matrix subject to a greater extent than the control group, in both anaphora and cataphora. As translators were at the training stage, the differences were not expected to be as substantial as they might be for their more experienced counterparts.

Participants

Two groups of native speakers of Italian participated in the study, trainee translators ($n=32$) and a control group of non-translators ($n=24$). All participants were students at the University of Bologna at Forlì.

The translators were enrolled in the two-year graduate programme in Specialized Translation at the Advanced School of Modern Languages for Interpreters and Translators. They all had an undergraduate degree in Translation Studies, Foreign Languages/Literatures or Intercultural Communication,⁴ and were selected for the Specialized Translation

programme based on an entrance exam which consisted of translations between Italian and two foreign languages. At the time of testing, the participants were in the second semester of their first year in the programme and some of them had already had some professional experience. They were recruited in the Specialized Translation between Italian and English course, which requires an advanced level of English; the majority (20 out of 32 participants) listed English as their main language, while the main languages of the participants who listed English second were Spanish (7 participants), French (4), and German (1). This division resulted from the programme's structure based on two obligatory foreign languages; the languages are designated as 'A' and 'B', but even though students receive the same number of credits for both,⁵ they tend to perceive language 'A' as their main language.

Due to time constraints imposed on the study, the students' proficiency in English was not formally tested, but the School's strict entrance criteria (a competitive entrance exam and language competence corresponding at least to level C1 of CEFR)⁶ ensure that they were at a very advanced level. We also asked the participants to rate their own knowledge of six different aspects of English (grammar, vocabulary, written and oral comprehension, written and oral production) on a scale from 0 (almost no knowledge) to 6 (excellent knowledge); the overall mean rating is given in Table 1, together with other details of the participants' backgrounds. The data gathered through a questionnaire confirmed that the trainee translators translated on a regular basis: the average estimated time spent translating was 2.72 hours per day (SD=1.20); within that time, 22 subjects (72%) stated that they engaged in translation from English into Italian frequently; 8 subjects (25%) did so occasionally, and only one subject (3%) reported translating in this language combination rarely.

[TABLE 1 NEAR HERE]

The control group was composed of BA and MA students of different subjects (International Relations and Diplomatic Affairs, Criminology, Sociology, Mass Media and Politics, and Mechanical Engineering). The participants from this group were also asked to judge their knowledge of English. As can be seen from Table 1, their mean self-assessment rating is close to that of translators, which is confirmed by a non-significant Wilcoxon rank sum test ($W=301$, $p=.255$).⁷ The difference is significant if only translators who have English as the main language are singled out from the experimental group ($W=141$, $p<.05$; $M=5.03$, range=4-6); however, given that the analysis of the main task produces virtually identical results regardless of whether the answers of all translators or only those from the 'main'

subset are included, and given that the similarity in ratings could be due to the groups' different perceptions of language proficiency rather than to their actual proficiencies, we decided to keep the translator group intact. This decision is further corroborated by a fact more central to the distinction between our participant groups than English proficiency, namely that none of the control participants had any experience as a translator.⁸ Lastly, among individual self-assessment components, a significant between-group difference was found for grammar knowledge ($W=256.5$, $p<.05$; $M_{\text{translators}}=5.00$, $M_{\text{controls}}=4.48$).

Materials and design

To test the interpretation of null and overt subject pronouns in ambiguous intra-sentential contexts we used a modified version of Tsimpli *et al.*'s (2004) PST; an almost identical version had already been used by Author (XXXX).⁹ The task contained complex bi-clausal sentences with a transitive main verb, and either a transitive or an intransitive embedded verb. All main clauses included two singular animate gender-matched NPs, in the subject and the object role; in half of the sentences the gender was male and in the other half female. The subordinate clauses featured a variety of structures, as detailed below.

Each sentence was accompanied by a set of three pictures; an example is shown in Figure 1, with corresponding sentences given in (5) and (6). In all three pictures a character A (representing the matrix subject) was shown performing the action described in the main clause. Different characters were shown as the agents of the action described in the subordinate clause: the same character A in one picture, the character B (the matrix object) in another picture, and the character C (an extra-linguistic referent) in the last picture. Pictures illustrating these different readings are numbered 1, 2 and 3 in Figure 1 respectively. The linear order in which the three readings were shown in the task was varied systematically.

[FIGURE 1 NEAR HERE]

There were four experimental and four control conditions. Experimental sentences contained a third person singular anaphoric or cataphoric null or overt subject pronoun in the subordinate clause; the overt pronoun was matched in gender with the subject and the object of the main clause. The experimental conditions are exemplified in (5a–d).

(5) a. ANAPHORA WITH A NULL PRONOUN

Il tassista parla al cliente mentre pro porta le valigie.

the taxi-driver talks to-the client while *pro* carries the suitcases
'The taxi driver talks to the client while he carries the suitcases.'

b. CATAPHORA WITH A NULL PRONOUN

Mentre pro porta le valigie, il tassista parla al cliente.
while *pro* carries the suitcases the taxi-driver talks to-the client
'While he carries the suitcases, the taxi driver talks to the client.'

c. ANAPHORA WITH AN OVERT PRONOUN

Il tassista parla al cliente mentre lui porta le valigie.
the taxi-driver talks to-the client while he carries the suitcases
'The taxi driver talks to the client while he carries the suitcases.'

d. CATAPHORA WITH AN OVERT PRONOUN

Mentre lui porta le valigie, il tassista parla al cliente.
while he carries the suitcases the taxi-driver talks to-the client
'While he carries the suitcases, the taxi driver talks to the client.'

Each experimental condition had a control counterpart. Control sentences were designed so as to match the predicted preferred readings of the four types of experimental sentences by the control participants and their purpose was to test whether the intended situations were shown clearly in the pictures, as well as to act as fillers. The control conditions are shown in (6a–d).

(6) a. POSTPOSED GERUNDIVE CLAUSE

Il tassista parla al cliente portando le valigie.
the taxi-driver talks to-the client carrying the suitcases
'The taxi driver talks to the client while carrying the suitcases.'

b. PREPOSED GERUNDIVE CLAUSE

Portando le valigie, il tassista parla al cliente.
carrying the suitcases the taxi-driver talks to-the client
'While carrying the suitcases, the taxi driver talks to the client.'

c. RELATIVE CLAUSE

Il tassista parla al cliente che pro porta le valigie.
the taxi-driver talks to-the client who *pro* carries the suitcases
'The taxi driver talks to the client who carries the suitcases.'

d. TEMPORAL CLAUSE

Mentre il giovanotto porta le valigie, il tassista parla al cliente.

while the young-man carries the suitcases the taxi-driver talks to-the client
'While the young man carries the suitcases, the taxi driver talks to the client.'

The gerundive clause conditions corresponded to the experimental conditions with null pronouns. Subordinate clauses in these conditions contained a gerund controlled by the subject of the main clause, and they either followed the main clause, or preceded it. The relative clause condition corresponded to anaphora with an overt pronoun. The restrictive relative clause followed the main clause and had a null subject co-referential with the matrix complement. Finally, the temporal clause condition corresponded to cataphora with an overt pronoun. Here the subordinate clause preceded the main clause; its subject was a singular animate NP, gender-matched with the subject and object NPs in the main clause, denoting an extra-linguistic referent.

There were 48 sets of pictures in the task, distributed across eight conditions in a Latin square design. Four practice items, modelled on the control conditions, were also included.

Procedure

The study was conducted in individual sessions lasting between 20 and 30 minutes. In the first part of the session the participants did the PST. The task was implemented with E-Prime 2.0 Professional and run on a Toshiba laptop with a 15.4" screen. The participants first read a sentence in a self-paced manner and then saw three pictures, clearly marked with numbers 1, 2 and 3. They were instructed to choose the picture that best matched the sentence in meaning by pressing the appropriate key on the keyboard (only one choice was allowed); the time for making a decision was not limited. The textual part was presented word by word, in a centre non-cumulative mode, in order to prevent the participants from spending too much time looking at complete sentences. Commas were not used under the rationale that they could introduce a bias towards a certain interpretation. In the second part of the session, the participants filled in a questionnaire that contained questions on their linguistic background and (for translators only) their experience with translation.

Results

In what follows we first look at individual experimental conditions by examining the distribution of the three responses (matrix subject, matrix complement, extra-linguistic referent) by participant group. The distributions are shown as mean proportions, calculated by

averaging the individual preferences obtained from the counts of the number of times each possible response was chosen by each participant in each condition.

The percentages of referent choices in the anaphoric and cataphoric conditions with null pronouns are shown in Figure 2. In the case of anaphora, both participant groups showed a tendency to interpret the null pronoun as co-referential with the matrix subject; the controls selected the subject option 66.67% and the translators 74.48% of the time. The choice of the matrix complement was not ruled out either (reaching a 31.25% and 24.48% selection rate for controls and translators respectively), unlike the extra-linguistic referent (marked as ‘Other’). In cataphora, the matrix subject also emerged as the preferred interpretation of the null pronoun on the part of both participant groups, even more clearly so than in the case of anaphora (85.42% of the choices); the matrix complement and the extra-linguistic referent, as the second and third choice respectively, accounted for the remaining 14.58% of the responses.

[FIGURE 2 NEAR HERE]

Figure 3 shows the distribution of responses in the overt pronoun conditions. In the anaphoric condition, both subject groups had a clear preference for the matrix complement as the antecedent of the overt pronoun (controls 77.78%, translators 80.21%) and they considered the matrix subject and the extra-linguistic referent as much less likely candidates. Given the focus of our study, it is particularly important to note that the translators opted for the matrix subject referent less frequently (10.42%) than the controls (18.06%). In the cataphoric condition, the two participant groups gave somewhat different responses: the controls ambiguously interpreted the overt pronoun as co-referential with the matrix complement and the extra-linguistic referent, giving a marginal preference to the former (39.58% vs. 34.72% of the choices). The translators, on the other hand, preferred the extra-linguistic referent as the antecedent of the pronoun, selecting it 53.13% of the time (versus 36.46% for the matrix complement), and they yet again selected the matrix subject less often than the controls (10.42% vs. 25.69%), both contrary to what was hypothesized.

[FIGURE 3 NEAR HERE]

A separate analysis was conducted on the responses given by the translators whose main language was Spanish, another null-subject language. In both anaphora and cataphora with

overt pronouns they selected the matrix subject referent in 7.14% of the cases, compared to the 10.42% of the overall group average. We thus concluded that no bias was induced by these participants.¹⁰

Overall, the two participant groups interpreted the four sentence types in a largely similar way: the matrix subject was the preferred antecedent for both groups in both null pronoun conditions, followed by the matrix complement; in the overt pronoun conditions, the matrix complement was the preferred choice in anaphora, and the extra-linguistic referent in cataphora, but the latter was the case only for translators, opposite from what was predicted. Some more discrepancies between the participant groups can be noted in the matrix subject choices in conditions featuring overt pronouns. In these conditions an overacceptance of subject referents was expected for translators (compared to controls); however, no such finding was attested. On the contrary, the translators had a *lower* level of subject referent choices.

To check the significance of these results, we fitted a polytomous logistic regression model to the data (keeping in mind the arguments against analysing categorical data using ANOVAs, put forward in a number of recent papers; see Jaeger 2008; Cunnings 2012). The outcome variable was the choice of referent (matrix subject, matrix complement or extra-linguistic referent), while the variables participant group (controls vs. translators), pronoun type (null vs. overt) and clause order (anaphora vs. cataphora) were entered in the model as predictors, together with three interactions deemed to be of interest (participant group x pronoun type, participant group x clause order and pronoun type x clause order). The analysis was performed using the R package *polytomous* (Arppe 2013), which allows the analysis of non-binary outcome variables such as our three-way referent choice. We used the one-vs-rest method, based on contrasting each outcome with the other two, grouped together, in a separate binary regression model (Arppe 2013: 22). This allowed us to treat all referents equally, without having to choose one as a baseline. The results are shown in Table 2.

[TABLE 2 NEAR HERE]

The model parameters are expressed in terms of odds in favour of or against the choice of a particular referent being selected given the predictor variables. The Intercept line denotes the odds contributed by aggregate default values of the predictor variables, in our case the control group's responses in the anaphora with a null pronoun condition. Values <1 indicate that the chance of a specific outcome is decreased, while those >1 specify an increase; asterisks signal

significant odds, i.e. predictors that contribute significantly to the selection of a given referent.

What we can see from the estimates is that the participant group on its own does not predict the referent choice significantly. The interaction between participant group and clause order is also non-significant. However, an important finding concerns the interaction between participant group and pronoun type: when group=translators and pronoun type=overt, odds are increased for the choice of extra-linguistic referent (3:1), and decreased for the matrix subject (0.4:1). This is in line with what can be seen in Figure 3 above, and it means that the subject referent is *less* likely to be chosen as antecedent of an overt pronoun by translators than by the control group (recall the 10.42 vs. 18.06% and 10.42 vs. 25.69% of total referent choices in anaphora and cataphora respectively), while the opposite is true of the extra-linguistic referent (9.38 vs. 4.17% and 53.13 vs. 34.72%). As expected, the pronoun type has a great impact on referent choice, with an overt pronoun increasing the odds of the matrix complement being chosen (9:1), and decreasing the odds of a matrix subject selection (0.1:1). Differences between anaphora and cataphora are also detected, with the subject being a more likely choice in cataphora (odds 2.9:1), and the complement in anaphora (odds 0.3:1 for cataphora). If, however, clause order=cataphora and pronoun=overt, the odds of an extra-linguistic referent being chosen become higher (4:1), while those of the other two referents are lowered (0.5:1 for both the complement and the subject). As expected, the default case increases the odds of subject selection (2:1), while it decreases those for complement selection (0.4:1), and in particular for extra-linguistic referent selection (0.02:1). In sum, the odds provided by the model match the descriptive statistics of Figures 2 and 3, confirming the significance of the outlined trends. Most importantly, when the participant group variable was crossed with pronoun type, the difference between the controls and the translators on the acceptance of subject antecedents for overt pronouns was found to be significant, but in the direction opposite to the predicted one.

As for model performance evaluation, with the Hosmer and Lemeshow's $R_L^2=0.3052$, we can be fairly confident that our model has a good fit to the data (cf. Han *et al.* to appear). This is confirmed by the model's prediction accuracy, which has the value of 71% overall, while for individual referents it reaches 84% for the subject, 62% for the complement and 52% for the extra-linguistic referent.¹¹ The predictions are thus above chance: the model is highly accurate in predicting the subject responses, and although its performance drops somewhat for the other two referents, it still remains at a satisfactory level.

Before moving on to the discussion of these findings, in Table 3 we summarize the results of the control conditions. The choices of both participant groups were in line with the predicted interpretations, indicating that the pictures did indeed portray the intended situations clearly: in the gerundive clause conditions there was a marked preference for the subject response; in the relative clause condition the most preferred response was the matrix complement, while in the temporal clause condition the participants prevalently selected the extra-linguistic referent.

[TABLE 3 NEAR HERE]

DISCUSSION

The experiment described in the previous section was used to test the interpretation of subject pronouns in ambiguous intra-sentential anaphora contexts in Italian by two groups of native Italian speakers, trainee translators from English and a control group of non-translators, with the goal of establishing whether translators pattern with L2 learners and L1 attriters from previous studies. We predicted that, compared to the control group, the translators in our study would exhibit L2 influence and L1 attrition by selecting more matrix subject antecedents for overt pronouns, as well as fewer extra-linguistic referents in the overt cataphoric condition; however, as the results showed, this was not the case.

One of the key factors to be considered in explaining this result is the professional (in)experience of the experimental group. Namely, the L1 attrition claim put forward by Cardinaletti (2005) concerned experienced translators (albeit only vaguely defined as subject to ‘prolonged’ contact with the L2), while the participants in our study were translation trainees. The main implication is that our subjects might not have engaged in translation long enough for English to start affecting their L1.¹² However, the time factor is not unproblematic in attrition studies (‘it appears that the role of immigration length for attrition is not as important as generally supposed’, Köpke and Schmid 2004: 12), and even more importantly, the role of the length of time since the onset of (potential) attrition is yet to be examined with regard to translators, as the central criteria of attrition studies (the moment of immersion into the L2 environment and the period of residence) do not apply to them. While the length of professional experience clearly constitutes a related measure, its status as a direct equivalent of the length of residence in attrition studies cannot be taken for granted, especially if one keeps in mind the lack of consensus in translation and interpreting research concerning the length of professional career that qualifies a translator as experienced: Köpke and Signorelli

(2012) point out that the participants' average professional experience varies greatly among individual studies in interpreting research, with the lower boundary sometimes set as low as the end of formal training; Englund Dimitrova (2005: 15–16) shows that analogous inconsistencies characterize the literature on translators. Lastly, even assuming a clear difference between experienced translators and trainees, if attrition were triggered by frequent translating activities, translators-in-training would as a minimum be *incipient* attriters; in our particular case, they would not have selected the inappropriate matrix subject responses significantly *less* frequently than the controls.

An additional factor that deserves consideration is the possible impact of training, as it appears highly likely that the performance of the translator group was due to the subjects' linguistic education. Multiple studies (Christoffels *et al.* 2006; Macizo and Bajo 2006, among others) show that translators and interpreters tend to outperform both monolinguals and untrained bilinguals on language tasks performed in (one of) their L1(s); the only bilingual subjects whose results match the translators' are L2 teachers (Christoffels *et al.* 2006), another group of highly proficient linguistically trained bilinguals. Recall also that trainee translators in our study differed from the controls on self-assessment scores for grammar knowledge. Further studies are needed to investigate this in more depth, but it can reasonably be assumed that linguistic training leads to the development of metalinguistic awareness ('ability to focus on linguistic form and to switch focus between form and meaning', Jessner 2006: 277), which in turn leads to advantages in language tasks. Such advantages have already been reported for translation/interpreting trainees (see e.g. Tzou *et al.* 2012); in fact, in their case the benefits could be particularly obvious at early career stages, as explicit knowledge is likely to be more available during and immediately after training than further along in the career. And while the cited studies focused on lexical retrieval, our results indicate that an advantage for metalinguistically aware individuals might also exist for the comprehension of syntactic phenomena which interface with discourse-pragmatics.

In sum, our study did not detect any L2-induced changes in the native language of trainee translators, at least not of the same kind as that found in persons living in an L2 environment for an extended period of time. One potential explanation for this outcome is the participants' lack of professional experience, which could have been insufficient for L2 influence to start manifesting itself; another possibility is that the L2 influence was overridden by heightened metalinguistic awareness. Alternatively, it is possible that the overuse of overt subject pronouns, previously reported for translated texts, constitutes a product of the translation process itself. This would be fully in line with the methodological observation often found in

attrition studies, according to which translation tasks should be avoided in the assessment of attrition, given that “translation tasks oblige the subject to activate the two languages simultaneously which may lead to interference” (Köpke and Schmid 2004: 27). It also remains to be seen if translators’ production in their L1 might be affected more than comprehension, and if this is the case, if the L2 influence can justifiably be interpreted as L1 attrition (cf. Pavlenko 2004, and other work on bidirectional transfer).

An interesting wider implication of our study is that translators might constitute a special bilingual population, defined, among other factors, by their training. If linguistic training is taken into account, translators can be seen as complementary to L2 learners, L1 attriters and simultaneous bilinguals, as well as (partly) comparable to language teachers. The effects of linguistic training have attracted some attention in translation and interpreting studies and those strands of L2 acquisition research that are related to teacher training, but they are not commonly invoked in (psycho)linguistically oriented studies dealing with L2 acquisition and L1 attrition. It seems to us that this lacuna should not remain unfilled, as new findings would not only help us understand the impact of linguistic training on L1 and L2 competence, but they could also provide us with valuable teaching implications for different bilingual target groups.

CONCLUSION

The results of our experiment on anaphora resolution in Italian have provided no evidence of incipient L1 attrition in trainee translators. However, what we presented in this paper is in several respects an initial study and a number of questions remain open for future research.

First, data from experienced translators are needed to complement our findings; obtaining such data will require adapting the relevant variables from attrition studies to the specific context of translation, primarily deciding whether the length of translation career constitutes an appropriate equivalent of immigration length. Second, while trainee translators have been shown not to misinterpret overt pronominal subjects when engaging in L1 comprehension, they might behave differently when translating; the alternative hypothesis that problems with overt pronouns arise from the translation process should therefore be verified on data gathered in translation tasks. Lastly, among the topics that still wait to be researched we single out the role of linguistic training in bilingual groups with different educational backgrounds, and we believe that including translators in the exploration of these factors can help us gain a better understanding of bilingualism in general.

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¹ Carminati's (2002) study involved a range of sentence types, some of which had pronouns in the main, and some in the subordinate clause. Sentences similar to our example (2) were used in her Experiment 2.

² HP = J. K. Rowling's *Harry Potter and the Philosopher's Stone*. For full bibliographic details see Cardinaletti (2004: 135, fn. 6).

³ Two anonymous reviewers suggest that in the case of translators a production task could have been more indicative of ongoing attrition than a comprehension task. While we do see a production task as a likely choice for a follow-up study, for the sake of comparability our initial goal was to replicate the methodology used in most of the relevant studies dealing with L2 acquisition and L1 attrition.

⁴ One participant did not provide information on previously attended courses.

⁵ See <http://corsi.unibo.it/Magistrale/TraduzioneSpecializzata/Pagine/PianiDidattici.aspx>.

⁶ See <http://www.unibo.it/qualityassuranceen/ReportsBDC/Report-8061-2010.pdf>.

⁷ All statistical analyses were performed using R version 2.15.2 (R Core Team 2012).

⁸ We leave to future studies the task of looking at possible differences between native speakers of Italian who have low vs. high proficiency in English. For the purposes of the present study it was crucial to separate translators from non-translators, and even if the level of English turned out to be comparable in the two groups, this would not affect the interpretation of the results.

⁹ Modifications to Tsimpli *et al.*'s (2004) task in Author (XXXX) involved changes in the number of items, the experimental design and some of the experimental procedures. The present version differed from the one in Author (XXXX) solely in the way the sentences were presented on the screen (self-paced vs. speeded mode).

¹⁰ Note also that Spanish has been shown to allow overt subject pronouns to refer to matrix subject antecedents to a greater extent than Italian (see Filiaci *et al.* 2014).

¹¹ The accuracy values are calculated based on a cross-tabulation of the observed referent choices with those predicted by the model, shown below.

	Predicted	Subj	Compl	Other
Observed				
Subj		526	79	20
Compl		127	326	70
Other		19	75	102

¹² Another factor mentioned by Cardinaletti (2005) is near-nativeness in the L2, which might be absent in our participants. However, near-native competence in the L2 is not considered to be a necessary condition for L1 attrition to take place (see Köpke and Schmid 2004).

Table 1: Participant biodata

Participant group	Age at testing (years)		Length of exposure to English (years)		Self-reported proficiency in English (out of 6)	
	Mean	Range	Mean	Range	Mean	Range
Translators	23.22	22-26	14.5	11-21	4.80	3.67-6.00
Controls	22.13	19-26	11.25	4-15	4.56	2.67-5.83

Table 2: Polytomous logistic regression model results

Predictor variable	Odds of referent selection		
	Subject	Complement	Other
Intercept	2.014 ^{***}	0.417 ^{***}	0.018 ^{***}
Group (Translators)	1.440	0.837	0.681
Pronoun Type (Overt)	0.108 ^{***}	9.377 ^{***}	2.511
Clause order (Cataphora)	1.873 ^{***}	0.314 ^{***}	2.925
Group x Pronoun Type	0.375 ^{***}	1.138	3.195 [*]
Group x Clause order	0.709	0.965	0.969
Pronoun Type x Clause order	0.479 [*]	0.540 [*]	3.992 [*]

*p<.05, ***p<.001

Table 3: Results of the control conditions

Condition	Group	Referent choice		
		Subject	Complement	Other
POSTPOSED GERUNDIVE CLAUSE	Controls	93.06%	6.25%	0.69%
	Translators	93.23%	6.25%	0.52%
PREPOSED GERUNDIVE CLAUSE	Controls	91.67%	6.94%	1.39%
	Translators	91.15%	5.21%	3.65%
RELATIVE CLAUSE	Controls	12.50%	84.72%	2.78%
	Translators	5.21%	92.19%	2.60%
TEMPORAL CLAUSE	Controls	2.78%	3.47%	93.75%
	Translators	2.08%	6.25%	91.67%

Figure 1: Example of a picture set

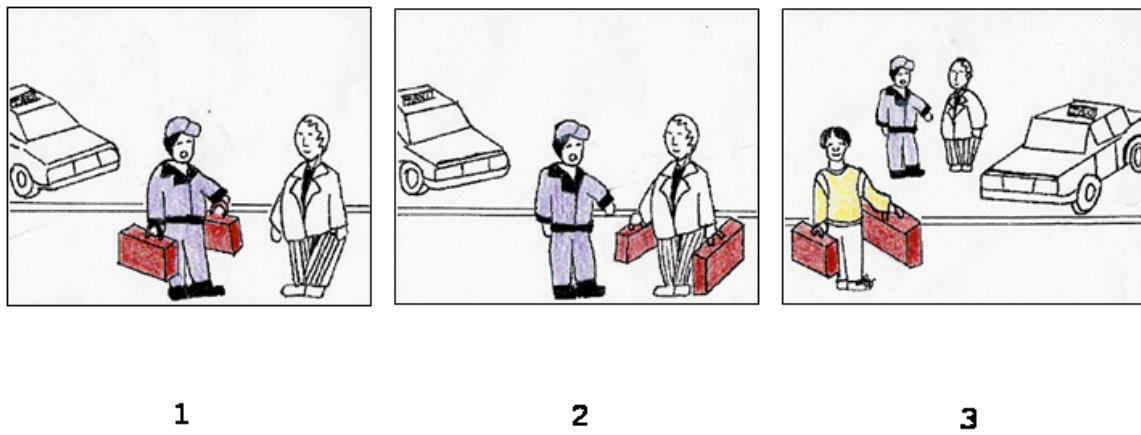


Figure 2: Mean responses in the null pronoun conditions

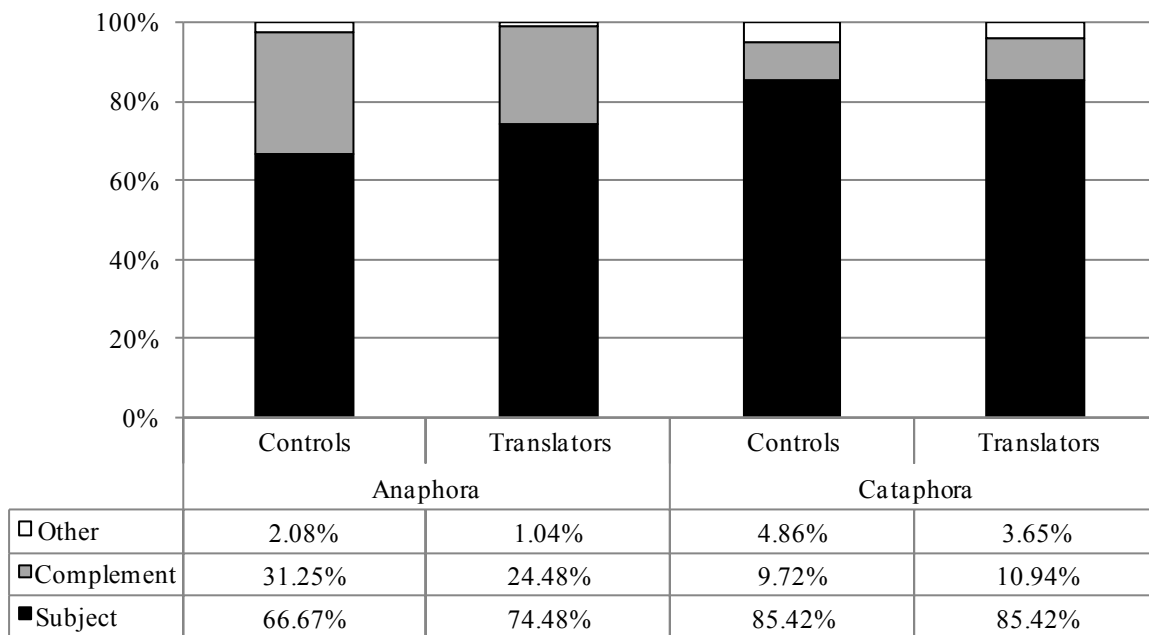


Figure 3: Mean responses in the overt pronoun conditions

