Do code-switching and sociolinguistic environment modulate the processing of ambiguous pronouns? Insights from Italian-English bilinguals

Code-switching (CS) is the bilingual practice of alternating between languages within a single interaction or utterance [1]. While CS was found to be employed for socio-pragmatic reasons [2] and to facilitate low-frequency word prediction [3], as far as we know, no study has explored its effects on critical structures in bilingual processing, such as syntax-pragmatics interface phenomena [4]. We aim to do so by exploring whether the processing of ambiguous pronouns in sentences presented in Italian and in sentences which involve CS from English to Italian differs in terms of referent selection and RTs. Contrary to English, which tends to refer ambiguous anaphoric pronouns to the subject of the preceding sentence, Italian, which is a pro-drop language, presents different tendencies for null and overt ambiguous pronouns, with null pronouns more frequently referring to the subject of the preceding sentences and overt pronouns more often referred to the object [5]. Furthermore, given the role of sociolinguistic context in bilingual language processing [6] and the susceptibility of ambiguous pronouns to language attrition [7], we seek to explore whether linguistic environment (i.e. living in Italy VS. in an anglophone country) influences ambiguous pronouns resolution, both jointly and independently of CS.

Participants were recruited on Prolific and were pre-screened using its built-in screeners and an ad-hoc questionnaire according to the following criteria: (i) being Italian-English bilinguals, with Italian as a native language and an estimated level of at least B2 CEFRL English proficiency and residing (ii) either in Italy (Group 1) or in an anglophone country (Group 2). English proficiency was checked using Cambridge's online English test. In the experiment, participants in Group 1 and Group 2 listened to the same auditory stimuli: each test item began with a sentence introducing two animate characters of the same grammatical gender and with comparable lexical frequency [8, 9], followed by a second sentence containing an ambiguous pronoun referring to the first part of the test item. Each test item occurred in one of four different conditions (see Table 1), for a total of 240 test items. Half of the test items were entirely in Italian, while the other half involved CS. Both conditions included an equal number of explicit and implicit ambiguous pronouns. The 240 sentences were equally distributed in 4 lists. Each list contained an equal number of sentences with/without CS, and with an implicit/explicit pronoun. Each participant received 1 of the 4 lists and 60 additional fillers.

We ran GLME and LME models with referent choice and RTs as dependent variables respectively, including language of the stimulus and country of residence as fixed factors, plus referent choice in the LME. Preliminary results (Group 1, N=39; Group 2, N=48) show no effect of CS on antecedent selection. We found that the ambiguous pronoun condition significantly influenced antecedent selection, with null pronouns more often resolved to the subject and overt pronouns more often resolved to the object (t = -13.052). As Figure 1 shows, this tendency was significantly more pronounced for participants in Italy than those in an anglophone country (t = 5.232). Additionally, ambiguous pronouns resolved to the object led to longer RTs than those referring to the subject, especially in the case of null pronouns (t = 3.703). Our results reveal no effect of CS on resolving ambiguous pronouns but highlight the role of the sociolinguistic environment in bilingual language processing. Compared to Italian-English bilinguals residing in Italy, Italian-English living in an anglophone context showed a weaker tendency to link ambiguous null pronouns to the subject, which may point to potential syntactic attrition [7].

References

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Table 1. Experimental manipulation and stimuli examples.

		Code-switching	
		Yes	No
Pronoun	Null	N=60 (see 1a)	N=60 (see 1b*)
	Overt	N=60 (see 1c**)	N=60 (see 1d)

(1a/c)** *The woman   greets   the girl   solo quando [lei]**   attraversa la strada*
The woman.NOUN.SBJ. greets the girl.NOUN.OBJ only when **[she.3S.NOM]**** crosses the road
(1d/b*) *La donna   saluta   la ragazza   solo quando [lei]*   attraversa la strada*
The woman.NOUN.SBJ. greets the girl.NOUN.OBJ only when **[she.3S.NOM]*** crosses the road

Figure 1. Predicted probabilities of referent choices for participants residing in different contexts.