The bilingual advantage revealed in monolinguals that are early exposed to L2

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There's an ongoing debate on the advantage of bilingualism on the development of pragmatic abilities and executive functions in children (Bialystok & Poarch, 2014; Paap & Greenberg, 2013). Many studies by Bialystok and colleagues (cf. Bialystok, Craik and Luk for a recent overview) show that bilingual children outperform their monolingual peers on different tasks, in particular those involving attentive and control abilities. Other studies showed that bilinguals outperform monolinguals in tasks tapping their pragmatic abilities (Siegal, Iozzi, & Surian, 2009).

Our study. In this paper, we present the results of an experimental study on ## Italian children aged 4 and 5 (age range: ##; mean age: ##) that have been early exposed to English. All children in our sample (except from 2) were born in Italy, lived in an Italian monolingual family and had been attending an Italian-English bilingual school since the age of 3. They are exposed to the English language exclusively at school. Children were split in two classes: 6 of them (ranging in age between 4,6 and 5,3) were enrolled in the Transition class and had been exposed to English for two years at the time of testing; the remaining 18 (age range: 5,1-6,4) were enrolled in the Reception class and had been exposed to English for three years at the time of testing. We administered three tasks in two separate sessions:

- the Scalar Implicature Truth-Value-Judgment Task (TVJT, already used by Foppolo, Guasti, and Chierchia, 2012 with 5 year-old monolingual Italian children) to test for their pragmatic competence;
- a test for inhibitory control (The Frog Test, Marzocchi, Re, and Cornoldi, 2010), standardized on Italian monolinguals from age 5 to 11;
- the ambiguous figure task (AFT) to test for selective attention and perspective shifting, modeled after Bialystok & Shapero, 2005.

In the TVJT children were shown a video of 12 short stories in which a puppet described what had happened in each story at the end. The child's task was to evaluate the puppet's description as appropriate or not. In one of the critical *some*-condition, for example, there were five Smurfs that could either go on a trip by boat or by car. In the end, all the Smurfs went on a trip by boat and the puppet described the outcome of the story by using the underinformative (logically true) sentence "Some of the Smurfs went on a boat" instead of the more pragmatically appropriate description "All the Smurfs went on a boat" in which the most informative scalar alternative in the scale <some, all> is used.

In the Frog Test, children were asked to attend to sound instructions to make a frog jump along a 20 step ladder. In particular, they were instructed to make the frog jump ahead when a *go*-sound was played, and NOT to make the frog jump when the *no-go* sound was played. The two sounds were identical except that the *no-go* sound terminated with a "D'oh!". The idea is that the child should wait until the end of the sound before starting an action, something that should be easier for those subjects that have a high inhibitory control ability.

In the ABT, children were shown four classical ambiguous figures: two figure-ground figures (vases/face, woman/sax) and two content-meaning figures (man/rat, duck/rubbit). They were asked to point to the figures that they could see in each image, being formerly informed that each image contained two separate figures that could be detected by shifting perspective (the classical old lady/young lady figure was given as a practice trial). The child was given a score from 0 to 5 depending on the autonomy with which she could see both images (successive tips in identifying the second image were given to the child, including

disambiguated versions of the classical figures). The procedure was identical to that described in Byalistoh and Shapero, 2005.

Results. In the test for pragmatic competence, we found that children in our sample rejected underinformative *some*-sentences 92% of the times, performing better than their Italian monolinguals peers: as shown in Foppolo, Guasti, Chierchia (2012), monolingual 5 year old Italian children tested with the same materials rejected the underinformative *some*-sentences 72,5% of the times (Foppolo, Guasti, Chierchia, 2012: Experiment 6).

We performed a logistic mixed model (Jaeger, 2008) on children's performance in which we analyzed the likelihood of providing a pragmatic response (i.e. rejecting the underinformative *some*-sentence) considering two fixed variables: the participants' Age (4,5, and 6) and the Class (Transition vs. Reception), that reflects the amount of exposure to the second language (2 vs. 3 years). The analysis show that children that had 3 years of exposure (i.e. participants in the Reception class) were significantly more likely to give pragmatic responses than children that had only 2 years of exposure (Estimate=3.4556, Std. Err.=1.1671, z=2.961, p=0.00307). In the same model, the contribution of Age was not significant (p=0.18764)**.** Although preliminary, especially due to the unequal numbers between ages and classes, we believe that these results are interesting and offer a first step for further investigation.

In the test for inhibitory control standardized for Italian children between age 5 and 11 (Marzocchi et al., 2010), 9 of the children in our sample obtained a score above 80th percentile; 7 a score between 50th and 80th percentile and only 5 scored below 30th percentile (3 children were excluded). In particular, the mean score of the 5 year old children was 8,75 in Transition and 11,72 in Reception, scores that are significantly higher than the mean score for their monolingual Italian peers (6,23). As in the TVJT, the children who had more years of exposure to the second language performed better than those with less years of exposure to L2 in this task. Finally, in the AFT our children performed quite poorly, compared to the results obtained by Bialystok and Shapero on 6 year old bilinguals. However, this data is not conclusive because we don't have a control group of Italian monolinguals yet and the age of our participants is younger than that of the children tested in previous studies.

Conclusion. Our results seem in line with the hypothesis of an advantage on pragmatic abilities and executive functions in bilingual children. Beyond the existing literature, we also show that this advantage is also revealed in a population of children that are born monolinguals but are early exposed to a second language (from age 3 on). Preliminary results suggest, moreover, that this advantage seems proportional to the amount of exposure to the second language.

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