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Language Competence in Italian Heritage Speakers: The Contribution of Clitic Pronouns and Nonword Repetition

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Abstract: The linguistic profile of bilingual children is known to show areas of overlap with that of children affected by Developmental Language Disorder (DLD), creating a need to differentiate the profiles and provide clinicians with tools to evaluate bilingual speakers in both of their languages. Data from typical adult bilinguals provide a picture of the language of a bilingual speaker at the end of language development. The present work explores how clitic production and nonword repetition (NWR) behave in mature language systems in situations of bilingualism, aiming to provide initial data as a benchmark on Italian as a non-dominant language. Heritage speakers (HSs) of Italian were confronted with adult immigrants (AIs) who moved from Italy to an English-speaking country in adulthood. Clitic pronouns were found to be vulnerable in HSs, who produced approximately 35% of the target clitics against the 80% of Ais, suggesting that clitic pronouns may not be reliable structures to test language competence in heritage Italian. On the other hand, HSs were >97% correct in NWR, suggesting that this paradigm should be explored as a possible marker to test language competence in these populations.

Keywords: heritage speakers; bilingualism; clitic production; nonword repetition; specific language impairment; developmental language disorder; Italian

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1. Introduction

Assessment tools for language impairments are developed and/or assessed with particular care to fit the disorder that is being tested, the population that is being tested, as well as the combination of the two factors. The latter case has been at the center of bilingual research: the rise in numbers of bilingual children in schools across the globe has given rise to the necessity to (a) disentangle early (typical) bilingual profiles from impaired profiles to avoid the phenomenon of overdiagnosis in bilingual children, and (b) develop assessment tools that work specifically for bilingual children with language impairments to avoid underdiagnosis determined by an absence of discriminating tools (Genesee et al. 2004; Hamann 2012; Grimm and Schulz 2014; Garraffa et al. 2019). As knowledge of the bilingual spectrum widens, it is becoming increasingly clear that great caution must be applied in weighing bilingual individuals' abilities against standards that they may never reach depending on their linguistic environment. For this reason, understanding what to expect of the ultimate attainment of healthy bilingual adults growing up and/or living in specific environments is of great importance for the advancement in diagnoses and assessments of the children who share similar profiles and for developing reliable measures for adult speakers of more than one language. In this paper, we aim to contribute to this endeavor with data on heritage speakers. Heritage speakers were tested on two clinical markers for Italian Developmental Language Disorder (DLD, Bishop 2017): NonWord Repetition (NWR) and Direct Object (DO) clitic production. It is particularly relevant to study the language of this population in relation to clinical assessments, because the language of

heritage speakers is, in several areas, different from both the monolingual standard and the language of bilinguals who are dominant speakers. Furthermore, their language is subject to changes from childhood into adulthood due to changes in dominance. For this reason, it is crucial to have data on healthy adult heritage speakers as a benchmark for assessments.

1.1. Heritage Languages

The definition of the heritage speaker has been at the heart of the discussion of the recent literature on bilingualism. A relatively uncontroversial fact about heritage speakers is that they are native acquirers of a language at home and a majority language in society, typically because of acquiring the language of an immigrant family in a host country (Fishman 2001; Rothman 2009; Benmamoun et al. 2013; Montrul 2008, 2016). Due to this linguistic environment, heritage speakers experience a shift in dominance from the heritage language, which is the dominant (and often only) language they are immersed in at birth, to the societal language once they start schooling in the host country (Rothman 2009; Kupisch and Rothman 2018).

What is more controversial about heritage speakers is the categorization of what is referred to as Heritage Language (HL). Although heritage speakers are, by definition, native speakers of the family language, they are often described as not reaching 'native-like attainment' (Benmamoun et al. 2013). As such, adult varieties of HLs have sometimes been described as resulting from 'incomplete acquisition' (Montrul 2008, 2016), suggesting that heritage speakers' linguistic maturation reaches a plateau before acquisition is complete. This definition stems from the observation that, at least in some areas of language, their attainment is mostly divergent from the gold standard of adult native monolingual varieties, and it is often less uniform than in the monolingual context, with great individual variation (Montrul 2016). Attainment has been shown to be divergent, for instance, for some aspects of morphology such as agreement in the nominal and verbal domain (e.g., Spanish heritage/English-dominant bilinguals in Scontras et al. (2018); Italian heritage/German-dominant bilinguals in Bianchi (2012)), in syntactic dependencies (e.g., in dependencies across an intervener in Russian heritage/English-dominant speakers, Polinsky 2011, in clitic climbing constructions in Italian heritage/Swedish-dominant speakers, Romano (2020, 2021)), and more (see Polinsky and Scontras (2020) for a recent review).

Nonetheless, the extent to which heritage and monolingual languages differ is still debated, and several factors seem to play a role in determining just how divergent a HL will be. For example, higher literacy in the HL (see Kupisch and Rothman (2018)), as well as a higher level of education (Schmitz et al. 2016; Schmitz and Scherger 2019), seem to determine an attainment which is closer to monolingual norms. Another factor that seems relevant in determining the HL, more so than in monolingual speakers, is individual variation (Zirnstein et al. 2019; Bice and Kroll 2021). The idea that the language of heritage speakers is the result of a plateau effect during acquisition has thus been challenged in recent years. Factors in favor of moving away from this view were, for instance, the observation that differences emerge when adult and child speakers of one heritage language are compared. This was the case in heritage speakers of Russian as tested on relative causes by Polinsky (2011). Twenty-one adult (mean age 22 years) and 29 child (mean age 6.2 years) heritage speakers of Russian in a US English-dominant environment were tested together with two age-matched monolingual Russian groups on sentence comprehension of Russian relative clauses carried out through a sentence-picture matching task. Russian allows for reflexivization of all arguments of a baseline sentence through a relative pronoun (*kotor-*) that agrees with the reflexivized constituent in gender and number and shows case concord. Relative clauses can have both REL-VO and REL-OV word order for both object and subject relatives. While child heritage speakers performed like monolingual child speakers of Russian in accuracy on all conditions (SR-VO, SR-OV, OR-VO, OR-OV), adult heritage speakers performed like their monolingual controls in the subject relative clauses but showed a selective vulnerability in object relative clauses. The author interprets this result as suggesting that HLs are not fossilized at an earlier stage, as

might be suggested by the idea of 'incomplete acquisition', but they change as a result of the shift in language dominance. Therefore, a shift towards the use of a terminology (such as 'differential acquisition', Kupisch and Rothman (2018)) that does not imply a failure to comply with specific standards, but rather that describes heritage languages are (one of many) varieties of a 'motherland' language has been proposed.

More importantly, for our aims, a consequence of the shift of the attention away from HL as compared to native monolingual grammars pertains to baselines: because of both the linguistic differences heritage speakers show from monolingual native languages, and the environmental differences of their acquisition as compared to speakers in the motherland, a recent trend in bilingual research emphasizes the need to compare HLs to the community, providing them with the input (Benmamoun et al. 2013; Madsen 2018; Polinsky 2018). These are typically long-term immigrants who have acquired the language as native monolinguals but have later moved to a country where this is not the majority language. The diasporic variety spoken by these immigrants constitutes the primary input in heritage acquisition, but it is itself shown to be divergent from the monolingual variety spoken in the homeland: long-term immigrants are known to be subject to phenomena of change in contact, which are usually identified under the name of '(first language) *attrition*' of the dominant, non-native language over the native language. Attrition appears in different language domains at different stages of second language exposure (Yip and Matthews 2000; Argyri and Sorace 2007; Kupisch 2007; Nicoladis 2012. See Schmid 2011 for a review of the topic of first language attrition). Moreover, attrition phenomena are also present in heritage speakers, where they are usually referred to as 'dominant language transfer' (Müller and Hulk 2001; Montrul 2016; Polinsky 2018).

The discussion on HLs highlights the importance of determining (adult) benchmarks for the assessments of bilingual speakers at different points on the bilingual spectrum. This is particularly relevant for assessments specifically targeting clinical profiles that involve language abilities, such as DLD.

1.2. Differentiating Bilingualism and Language Impairment

DLD is a neurodevelopmental disorder occurring in about 5–7% of all five-to-six-year-olds (Tomblin et al. 1997). Children with DLD exhibit a delayed onset of language and language limitations that do not resolve over time, but plateau before reaching complete mastery (Leonard 1998, 2014; Rice 2004). While delays with respect to age-matched peers are reported at different linguistic levels (Leonard 1998, 2014), morphosyntax seems to be inordinately difficult. In this area, children with DLD are reported to perform poorer than both age matched and younger Typically Developing (TD) peers. The areas of difficulty vary cross linguistically. In Germanic languages such as English, for example, the area of verb morphology has been identified as problematic, with children with DLD showing an (Extended) Optional Infinitive profile (EOI), where verb finiteness is optionally omitted as it is in very young TD children (Wexler 1994; Rice and Wexler 1996). However, verb morphology is much less problematic for children with SLI speaking languages that permit null subjects and/or prohibit bare verb stems (e.g., Hebrew, Dromi et al. (1999); Spanish, Bedore and Leonard (2001); Italian, Leonard and Bortolini (1998)). On the other hand, children with SLI show an impairment in freestanding functional elements, particularly clitics, in some of the languages that have this construction (e.g., French, Hamann et al. (2003); Tuller et al. (2011); and Italian Bortolini et al. (2002, 2006); Leonard and Dispaldro (2013); Arosio et al. (2014); Guasti et al. (2016)).

Crucially, (simultaneous and sequential) bilingual TD children exhibit delays in some of the areas of morphosyntax that are vulnerable in DLD children, and the overlap has received considerable attention. Using the same examples of areas of impairment provided for DLD children, French-English bilingual TD children also show to be in the OI stage in English well over the age when this is surpassed in their monolingual peers (around seven years of age, Paradis and Crago (2000)); similarly, the appearance and correct use of clitic pronouns has been shown to be delayed in bilingual TD children compared to

monolingual TD children, as found in bilingual speakers with a Germanic and Romance language (Serratrice et al. (2004); Ferrari (2006) for Italian; Belletti and Hamann (2004); Hamann and Belletti (2006) for French), but also for bilinguals with two clitic languages (Vender et al. 2016), as we discuss in further detail.

While a correct clinical diagnosis of DLD is difficult in both monolingual and bilingual speakers, it is especially challenging in bilinguals, who are subject to both over- and under-diagnosis because of the potential overlap in profiles (Grimm and Schulz 2014). Standards for the identification of language impairment in bilingualism are yet to be fully determined (Thordardottir 2015); although the best solution would be to have combined L2 and L1 assessments to have a complete linguistic profile, this is rarely feasible (Paradis 2010; Hamann 2012), for reasons including the absence in many languages of the tools for assessing DLD, but more importantly the fact that most available tests adhere to monolingual norms. Particularly in the context of immigration discussed here, as anticipated in the previous section, bilinguals may never reach these monolingual norms; moreover, due to the shift in dominance occurring in these settings, it is unclear whether the standard should be that of the societal or the family language, and this is likely to change depending on the age (Grimm and Schulz 2014).

For these reasons, the current endeavor in bilingual research is to identify best practices and assessments in bilingual settings. On one hand, important provisos such as the necessity to collect background information via questionnaires for a complete linguistic anamnesis (see Blom et al. 2019) are being discussed; on the other, bilingual children with and without DLD are being tested to establish what clinical markers work best in the bilingual setting by selecting appropriate normative data. This is giving rise to the creation of important tools such as the Language Impairment Testing in Multilingual Settings (LITMUS, Armon-Lotem et al. 2015) which are reliable in identifying DLD in bilinguals, as for example shown for children with German and French as majority languages tested on sentence repetition (SR) and nonword repetition (NWR) (Tuller et al. 2018).

1.3. Clinical Markers for Italian in Bilinguals: Clitic Pronouns and Nonword Repetition

The current study replicates the structure of the study by Vender and colleagues (2016) on a different population of bilinguals. The authors test bilingual children of Italian and another clitic language on two tests used in clinical practice to assess DLD in Italian: the production of DO clitic pronouns and NWR.

Clitic pronouns (*la mamma la saluta*, the mother her.CL greets, 'mum is greeting her') are pronominal elements that are available in some languages to refer to objects with the highest accessibility in the linguistic and extralinguistic environment. They are reported to be the weakest referential expression, lacking sufficient structure to be standalone elements (see Cardinaletti and Starke (1999) for discussion). For this reason, their use is reliant on the presence of a host verb (Kayne 1975). Their strict relationship with a host verb determines their position, which is typically distinct from the argument position and involves movement. Despite this, monolingual children acquire this structure early, showing full comprehension within the first few years across clitic languages (McKee 1992; Padilla José 1990; Jakubowicz 1984) and a fully-fledged use of clitics by about age four (Schaeffer 2000; Leonini 2006a, 2006b).

Clitics have been shown to be reliable early clinical markers of impairment for monolingual children in Italian and other clitic languages (see Bortolini et al. (2002, 2006), Leonard and Dispaldro (2013) for Italian; Hamann et al. (2003); Jakubowicz et al. (1998) for French). In fact, pre-school children with DLD were shown to persistently omit direct object (DO) clitic pronouns, giving rise to illicit sentences whereas their TD peers show a fully-fledged clitic system. Looking at Italian, Bortolini et al. (2002, 2006) described Italian children with DLD as considerably less accurate in the production of elicited DO clitic than age-matched controls (less than 30% vs over 90% accuracy). The alternative productions feature illicit omission of the internal argument in younger children (*porto 'I take', Bortolini et al. 2002, 2006; Leonard and Dispaldro 2013), and the production

of noun phrases in older participants (porto il cane 'I take the dog', Arosio et al. 2014; Guasti et al. 2016). As anticipated in the previous section, several studies highlight an overlap between DLD and TD bilingual profiles on this marker. In a longitudinal study on the spontaneous productions of simultaneous and successive bilingual speakers of French (a clitic language) with German L1 (a non-clitic language) as well as monolingual DLD speakers of Italian, Hamann and Belletti (2006) report a delay of complement clitics over subject clitics in all populations tested. However, the longitudinal perspective allowed to see that while monolinguals, bilinguals, and early L2 learners showed a consistent increase in clitic use, DLD children did not. Interestingly, in terms of non-target responses, the reverse pattern was observed in monolingual children who resembled the DLD children in not showing placement errors in spontaneous data, whereas such errors are documented for early (and late) bilingual acquisition.

NWR tasks test phonological processing as well as short-term memory. The test is sensitive across different language disorders, including in DLD, where both phonological processing and short-term memory are vulnerable (Baddeley 2003; Conti-Ramsden 2003; Dollaghan and Campbell 1998; Montgomery 2003). In Italian, poor performance on NWR has been shown to be a reliable early marker for monolingual children at risk for DLD, with pre-school children performing significantly worse than their TD counterparts (Bortolini et al. 2006; Casalini et al. 2007), particularly regarding omitting final syllables.

The two tasks were investigated in bilingual children in the study under discussion. The children included in the study were approximately five years of age, lived in Italy, and had at least one year of exposure to Italian (from daycare or from one Italian-speaking family member) while acquiring different languages at home (Albanian, Arabic, and Romanian). All languages learned at home were, like Italian, clitic languages. Third person clitics inflect for person, gender, and number in Romanian and Arabic, and for person and number in Albanian. The bilingual children were compared to age-matched monolingual speakers of Italian.

All bilingual groups performed considerably below the monolingual control group in total number of correctly produced clitics, as reported in Table 1 (adapted from Vender et al. 2016, p. 10). However, when the overall number of produced clitics (correct and incorrect) was considered, at least two of the three bilingual groups (Albanian and Romanian) reached monolingual performance (see Vender et al. 2016 for an explanation on the results obtained in the Arabic group). The most common error was thus the production of a clitic with non-target features rather than omissions or misplacement. The types of errors were mostly regarding favoring the unmarked or default clitic, namely masculine for feminine and singular for plural.

Table 1. Percentage of target clitics and clitics with incorrect features (and standard deviations) produced in a DO clitic production task in Vender et al. (2016).

	Target (SD)	**Incorrect Clitic (SD)**
Albanian	0.48 (0.50)	0.33 (0.47)
Arabic	0.29 (0.45)	0.24 (0.42)
Romanian	0.51 (0.50)	0.29 (0.45)
Monolingual	0.73 (0.44)	0.16 (0.36)

As all first languages were also clitic languages, the results from this study imply that it is not only the presence/absence of the structure in both languages alone that facilitates the use of clitics, although it might determine the nature of the responses. Belletti and Hamann (2004), in fact, who investigate the spontaneous speech of two bilingual speakers of French, one with L1 German (a non-clitic language) and one with L1 Italian (a clitic language), find crucial differences in the responses in the two children. In particular, the successive bilingual speaking Italian with L1 French made no errors in the distribution of the clitic, even in contexts where the distribution of clitics is different in the

two clitic languages. This is the case in non-finite contexts, where French has proclisis but Italian has enclisis (*J'amerais le connaître/ vorrei conoscerlo,* 'I would like to know him'). On the other hand, the successive bilingual speaker of French with L1 German made errors of distribution (for example, the use of an object clitic in isolation: *c'est à moi, le* 'it's mine, that one'), that the authors claim might be attributed to a transfer phenomenon. Similar misplacement errors have been attested in TD French speakers with other L1s, for example with Swedish (Granfeldt and Schlyter 2004). However, the frequency of this non-target response is dispreferred compared to the production of a lexical item and the omission of the clitic (Paradis 2004; Rogers 2010; White 1996; Belletti and Hamann 2004).

1.4. The Current Study

Given the background presented, the present study collects data on two clinical markers for DLD in Italian in adult heritage speakers. Rather than comparing their performance to that of monolingual speakers of Italian, it is compared to that of Italian immigrants living in the same environment. In doing so, we aim to contribute to the endeavor to find the most appropriate markers for DLD in bilingualism, particularly with data on the bilinguals' heritage language. In fact, although for practical reasons assessments are usually performed in the societal language, it is not necessarily the case that this is the dominant language in all stages of a bilingual life, and we must have an awareness of what to expect from the heritage language as well as the dominant one. Moreover, assessments may also be required later in life, and it is thus necessary to have data for fair comparisons in both the dominant and the heritage language of an individual.

To our knowledge, this is the first attempt to establish a benchmark on Italian as a heritage language on two clinical markers of DLD for Italian, one structure and language-specific (clitic production) and one task-specific (NWR).

2. Materials and Methods

2.1. Participants

The current study was administered to 59 adult bilingual speakers of Italian (and English) with a different language history, namely heritage speakers of Italian who were born and raised in Scotland from Italian-speaking families (Heritage Speakers, HS; n = 30. Mean age 35;7), and native speakers of Italian who emigrated to Scotland as adults after the age of 20 years (Adult Immigrants, AI; n = 29. Mean age 39;3).

Age of first Exposure (AoE) to Italian, years of formal education in Italian, and years in the UK were extracted from the Leap-Q questionnaire (Marian et al. 2007), described in more detail below (see Table 2). Literacy in Italian was consistent within groups: none of the participants in the HS group had received schooling in Italian, except one who went to nursery school in Italy before moving to the UK, and all participants in the AI group completed compulsory education in Italy, with six of them completing higher education in the UK. The AoE to Italian was at birth for all participants, which were thus all native speakers of Italian.

Table 2. Demographics for the participants (and standard deviations): number, age in years, age of first exposure to Italian (AoE), level of education, formal education in Italian in years, years of residence in the UK. Raw scores (and standard deviations) for background measures: TROG-2 and Comprendo.

	Number	Age	AoE	Level of Education	Formal Education in IT	Years in the UK	TROG-2	COMPRENDO
Adult Immigrants (AI)	29	39.31 (11.76)	birth	Higher: 29	16.18 (2.5)	15.25 (8.9)	77.6/80 (2.02)	28.7/30 (0.2)
Heritage speakers (HS)	30	35.7 (12.29)	birth	Secondary: 10, Higher: 20	0.04 (0.19)	35.4 (11.98)	79.1/80 (0.99)	28.1/30 (0.22)

2.2. Background Tasks

2.2.1. LEAP-Q

As all participants were immersed in an English-dominant environment at the time of testing, the LEAP-Q language profile questionnaire (Marian et al. 2007) was administered to calculate their exposure to both Italian and English throughout their lifetime and at the time of testing. To this end, the following categories were extracted from the questionnaire: interaction with friends, interaction with family, radio/music, TV, and reading.

2.2.2. TROG-2

A measure for the level of English of the two bilingual groups was collected through the comprehension task TROG-2 (Bishop 2003). The sentence-picture matching task features sentences divided in blocks of similar sentence type items for a total of 80 items. Each sentence is presented with 4 pictures, one target, one competitor, and two distractors, and participants are instructed to select one picture upon hearing the sentence. Sentences were read aloud by the researchers, who are fluent bilingual speakers of English.

2.2.3. Comprendo

We measured participants' knowledge of abstract representations of Italian grammar using a subset of the standardized sentence-picture matching test for Italian comprehension, Comprendo (Cecchetto et al. 2012). In its original version, Comprendo has a total of 100 items representing 10 different sentence types. In the subset, six items were selected from five of the sentence types, for a total of 30 items. The selected categories are the ones that in the original task were found to be the most vulnerable to different factors, namely subject and object relatives, as well as others which present very high performances in adult speakers, namely actives, coordinations, and passives. The test was adapted from PsychoPy2 (Peirce et al. 2019) for this study, where accuracy was measured. Upon hearing a sentence, participants were instructed to press one of two keys (x, n) mirroring two images on the screen, one target and one competitor. The items were randomized in this task.

2.3. Experimental Tasks

2.3.1. Clitic Production

The production of clitic pronouns was tested with an elicitation task. The task was adapted from the clitic elicitation task by Arosio et al. (2014) that involved eliciting DO and reflexive clitics, following Tedeschi (2008)'s task on referring expressions. The resulting task featured two conditions: one eliciting the use of a DO clitic pronoun, and the other eliciting the use of a lexical NP, for a total of 14 items.

In the elicitation task, participants are shown a hand-drawn color image which features a character performing an action with an inanimate or animate object, and they hear a sentence (the preamble) which introduces the character and his or her desire to perform an action on the object (1a). Next, a second image is shown where the character is portrayed in the process of performing the action he/she wanted to perform, and the participant hears a question about what the character is doing, as in (1b) below. The participants are instructed to answer the question. Three familiarization items preceded the experimental items. The pictures were shown on a computer screen, and the audio stimuli were played through loudspeakers.

(1) a. Preamble: In questa storia, una signora vuole dipingere una maschera. Guarda, cosa fa la signora alla maschera?
"In this story, a lady wants to paint a mask. Look, what is the lady doing with the mask?"

b. Elicited answer: la dipinge
pro it-CL.FEM paint-3SG
'she is painting it.'

All elicited clitics (seven) were direct object clitics. All were singular, four were masculine (*lo*) and three were feminine (*la*). The items eliciting a clitic were alternated to items eliciting the production of a lexical item (seven). In these items, the propositional phrase (PP) was not repeated in the probe so as to be treated as new information in the

elicited answer, as shown in (2). All items were presented in the present tense, in order to minimise the use of a compound verb.

(2) a. Preamble: In questa storia, una signora vuole dipingere una maschera. Guarda, cosa fa la signora?
"In this story, a lady wants to paint a mask. Look, what is the lady doing?"

b. Elicited answer: dipinge la maschera
pro paint.3SG the mask
'she is painting the mask.'

2.3.2. Nonword Repetition Task

Next, participants were tested on nonword repetition through a standardized test for Italian (Cornoldi et al. 2009). The task, based on Italian phonotactics, includes 25 items of increasing length (from one to five syllables), for a total of 60 syllables. The stress is either on the penultimate syllable (unmarked in Italian) or on the antepenultimate or initial syllable (marked). After a familiarization with two items, the stimuli were presented orally to the participants with the instruction to repeat each item. The scores were calculated considering the total number of correctly repeated syllables (up to 60). Some examples are given in (3).

(3) BA (1 syllable)
BLOZ
RORDO (2 syllables)
SASFRA
TASTOLA (3 syllables)

2.3.3. Procedure

Participants were individually tested either in person in a quiet room where only the participant and the experimenter were present, or via a Zoom call during the pandemic. The data presented here are part of a larger collection of data, and testing time was approximately 60 min per participant. In person, the researcher collecting data would put the participant in front of their computer screen and operate the PowerPoint presentations themselves; via Zoom calls, the researcher would share their screen with audio and operate the PowerPoint presentations themself. Participants were required to be in a quiet room and to have either a headset or loudspeakers on. Therefore, the conditions between in person testing and online testing were very similar for this study.

In the case of a sentence-picture matching task run on PsychoPy, participants tested in person could operate the programme themselves; however, when testing was moved online this had to be operated by the researcher as well. Participants were asked to say aloud whether they selected the image on the left or on the right of the screen. The transition was made possible by the fact that we were not looking at reaction times.

Answers were audio recorded and later transcribed by the experimenters, who are all native speakers of Italian, as well as bilingual speakers of Italian and English.

3. Results

Statistical analyses were run in R (R Core Team 2020). Simple linear regressions were run for TROG-2 and NWR with group as predictor and score as outcome, and a binomial mixed effects logistic regression with group (and condition) as independent variables and score as the dependent variable were run for Comprendo and the clitic production task.

3.1. Preliminary Tasks

All participants completed the tasks. Descriptive data concerning the groups and background measures for the two groups are shown in Table 2. The scores for interaction with friends, interaction with family, radio/music, TV and reading of the LEAP-Q questionnaire were added together. A logistic regression was run to check whether the resulting score differed between groups. AIs showed a statistically higher exposure than HSs ($\beta = 1.20$, $p = 0.03$), as visualized in the boxplot in Figure 1.

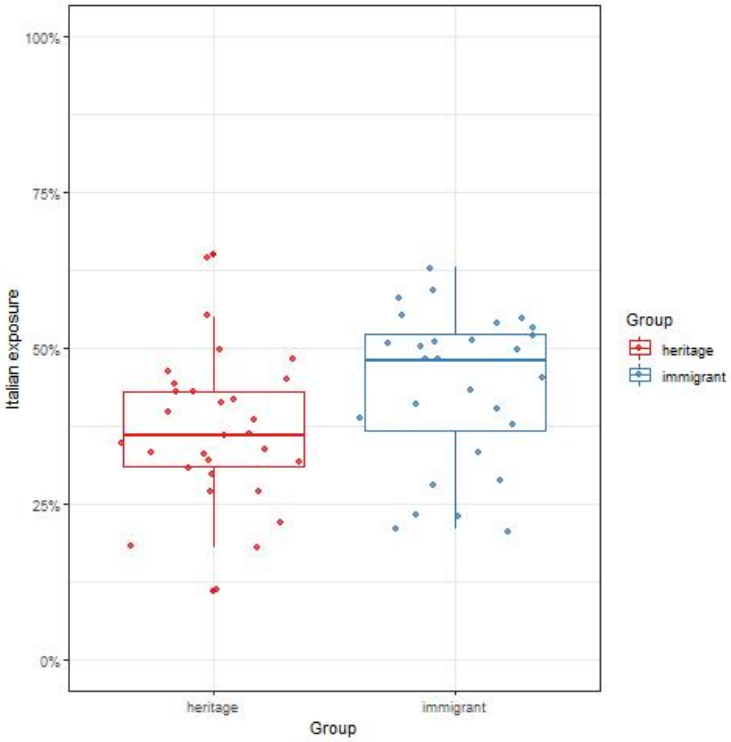

Figure 1. Correlation between group and exposure to Italian. The box draws the first, second and third quartile; whiskers extend to the maximum and minimum value excluding outliers.

Both groups showed similar proficiency in the abstract representation of Italian structures: a binomial mixed effects logistic regression with random effects of subject and type of sentence found no statistically significant difference between groups in Comprendo ($\beta = 0.19$, $z = 0.58$, $p = 0.500$), with an R^2 of 0.02. Participants' predicted score was 28.6, with HSs making 0.3 fewer points than AIs on average. A significant difference between groups was found in the TROG-2 task ($F = 12.97$, $p < 0.001$), with an R^2 of 0.19, meaning that the total score was predicted by the group of the participants. The average score of all participants is described by an intercept of 78.35, with AIs making an average 1.49 fewer points than HSs.

3.2. Clitic Production Task

The answers were categorized as target (1) or non-target (0). Target answers for the items eliciting the clitic were those containing the elicited pronoun, namely a DO clitic. When this was realized with the present tense, as elicited, the clitic had to have the correct gender and number features to be considered the target (e.g., *la pela* 'she/he is peeling it (fem)'). If the clitic produced was in the unelicited argument, namely an indirect object, but it was within a grammatical sentence, it was interpreted as correct (e.g., *Gli tira l'acqua* 'he/she throws him water'). In some cases, despite the question being in the present tense, answers contained a compound verb with a past participle, as in 4. When this is the case, particularly when in the feminine, the clitic is usually realized as a reduced form, where gender features are not overt, and gender is only overtly visible on the past participle. In these cases, the presence of a reduced clitic (*l'*) was counted as a target sentence.

(4)	L'ha	presa
	pro-CL has	taken
	'(he/she) took it.'	

In the remaining items eliciting a full nominal expression, target structures were considered those with a lexical NP. Strong pronouns (e.g., *lui/a lui* 'him/ to him') were considered errors in both conditions, as they are marked with contrastive focus in Italian. A qualitative analysis explored the non-target answers. Scores for clitic production task and

for the NWR task are reported in Table 3. We will focus on the results on the clitic condition in this context. The items eliciting lexical NPs were target answers in over 85% of the cases in both groups.

Table 3. Raw scores means and (standard deviations) for the DO clitic production and the NonWord Repetition (NWR) for both Heritage Speakers (HS) and Adult Immigrants (AI).

	Clitic Production	NWR
AI	5.6/7 (0.40)	59.7/60 (0.69)
HS	2.5/7 (0.48)	58.4/60 (1.9)

A binomial mixed effects logistic regression was calculated to predict score based on the fixed effect of group, condition (clitics, R-expression), and their interaction, with random intercept and slope for condition by subject and random intercept by item. The linear effect of group was significant ($z = 2.02$, $p = 0.040$). Type was also significant, with items eliciting object clitics being significantly harder than R-expressions ($\beta = -8.31$, $z = -3.88$, $p < 0.001$). Moreover, there is an interaction between group and type, with the AIs' score significantly better in the clitic condition than the NP condition and HSs better in the NP condition than the clitic condition ($\beta = 7.81$, $z = 2.50$, $p = 0.010$).

HSs produce a sentence containing the elicited clitic around 35% of the time, as opposed to the 80% of target answers produced by AIs. When the produced sentence does not contain a clitic, HSs produce sentences with a lexical NP (*cattura la farfalla* 'he/she is catching the butterfly'). Only 13 answers (4%) contain a clitic with a feature error on gender (*la solleva* 'he/she is lifting her up' when the probed direct object is the masculine NP *il pinguino* 'the penguin') or the wrong argument in an illicit context (**gli solleva* 'he/she lifts to him'), nine (3%) contain the use of the strong pronoun, and only six sentences feature an omission (**cattura* 'he/she is catching'). Therefore, alternative answers are mostly structurally sound, similarly to AIs, who do not produce grammatical mistakes. In all 20% of the cases in which AIs do not produce the target clitic, they produce a lexical NP.

3.3. NWR Task

A linear regression was calculated to analyze the results from the NWR task, calculating whether the score was predicted by the group. A significant difference between the two groups was found ($F = 12.99$, $p < 0.001$), with an R^2 of 0.18. AIs achieved 1.33 more points than HSs on average. As visualized in the density plot in Figure 2, heritage speakers' performance is spread across the highest scores, while the immigrants' performance is clustered in the ceiling score.

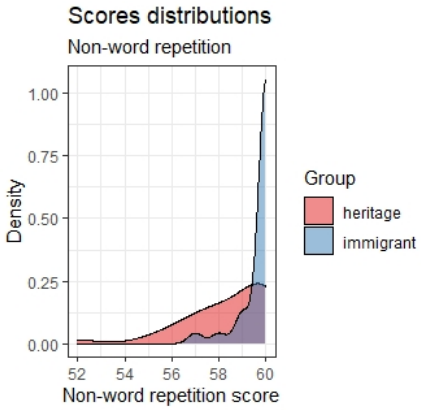

Figure 2. Density plot visualizing score distribution (x axis, with 60 ceiling score) on NWR in HSs and AIs.

4. Discussion

The present study aimed to investigate how adult heritage speakers behave on two clinical markers for DLD in their non-dominant, heritage language. In the clinical setting, this is useful to create a benchmark for the assessment of bilingual speakers in their heritage languages which moves away from the monolingual norms for that language and is more faithful to the language attainment experienced in that specific population. We focused our attention on the production of DO clitic pronouns and the repetition of nonwords, which are both clinical markers commonly used in the clinical practice to assess Italian speakers.

In morphosyntax, some of the areas that tend to be the most affected in the bilingual setting are those at the interface between syntax and discourse/pragmatics (Sorace 2011; Sorace and Filiaci 2006; Hulk and Müller 2000; Fenyvesi 2005), or those characterized by more complex syntax (Cuza and Strik 2012; Laleko and Polinsky 2016; Polinsky 2018). As deficient pronouns and as syntactic elements occupying a dedicated position in the clause, clitic pronouns belong to both categories. Our results show that, while the adult bilinguals who grew up in a monolingual Italian setting before moving to the UK (AIs) still exhibit a high production of target clitic pronouns (80% accuracy), the adult bilinguals who experienced a shift in dominance and quantity of input early in life (HSs) are poor producers of clitic pronouns (35% accuracy). Similarly to the speakers who grew up monolingual, heritage speakers' preferred choice of alternative structure is the production of a lexical item. As an aside, this shows an awareness of the pragmatic value of the strong pronoun in Italian (*lui, lei*, 'him/her'), which – due to its contrastive pragmatics - is heavily disfavored in this context in Italian. The choice of alternative structure marks the first difference with the bilingual children in Vender et al. (2016), who produce fewer target clitics than their TD counterparts, but they also produce high numbers of non-target clitics, clearly showing an intention to use the structure. While all groups in the study by Vender and colleagues were speakers of two clitic languages, the authors claim that the L1 by itself was not sufficient to explain differences between groups of participants. Rather, it seemed in the Vender et al. study that the actual length and quantity of exposure to Italian (the cumulative length of exposure) had the greatest impact on performance. Crucially, this is an aspect where our participants and theirs differ: because they are immersed in an environment where Italian is rarely present outside the family home, the input of Italian in the adult life of the heritage speakers is low, as revealed by the results on the Leap-Q. On the other hand, the children in Vender et al. are presumably starting a shift in dominance from their home language (Albanian, Arabic and Romanian) to the societal language (Italian). Therefore, results from this task are in line with those of Vender and colleagues: when exposure to Italian is lower due to a difference in dominance, bilingual speakers do not seem to fully adopt the production of clitic pronouns.

Another important thing to note about the alternative answers in the heritage group is the almost complete absence of omission and misplacement of the clitic. This is not per se an element that disentangles their performance from that of DLD Italians: in fact, while illicit answer strategies appear in the pre-school children with DLD (omissions, misplacements), studies featuring school-age children with DLD report a wider use of structurally licit answers featuring both a wider use of the clitic and the use of a full referential expression (Arosio et al. 2014; Guasti et al. 2016). This constitutes another crucial difference from the study in Vender and colleagues: there, typical bilingual children were quantitatively dissimilar to their TD monolingual peers and similar to DLD children, but a qualitative analysis of error patterns revealed differences that made the typical and atypical profiles distinguishable from each other; here, both quantitative and qualitative data collected on clitic pronouns are potentially similar to what may be expected of an atypical profile in a monolingual context. Therefore, the problem of the overlap in profiles between bilingualism and language impairment may not be overcome if clitic pronouns are used as markers in heritage speakers of Italian. In a similar vein, the necessity for quick assessments that do not lead to overlap problems has determined the exclusion of clitics from some assessments,

as is the case, for example, in French SR, where other complex structures such as object Wh-questions and relative clauses are utilized (Tuller et al. 2018).

The second clinical marker for DLD that was tested on adult bilinguals was NWR. On this task testing phonological awareness and phonological memory, both groups of adult speakers have a high performance (>97% correct). The performance of the adult heritage speakers is significantly lower than that of the expats, a difference that may be considered negligible if we accept the 90%-criterion of complete acquisition (Brown 1973). Therefore, the performance of HS on this task can be considered very high, as was the case for the bilingual children in Vender and colleagues' study. Importantly, this is not the case for DLD, who are known to struggle with phonological awareness and memory (Bishop et al. 1996; Casalini et al. 2007; Conti-Ramsden 2003; Vernice et al. 2013). This result leads to the assumption that, unlike the production of DO clitic pronouns, this marker for DLD might be efficient in heritage speakers.

Another notable fact to come out of the present study is that, in both markers, the performance of the HSs is very consistent within the group, as demonstrated by the low SD found in both tasks. This is an interesting and promising result in the endeavor to find efficient markers in this population, which has been described as having high individual variation due to the very different linguistic experiences of the people that form it (Zirnstein et al. 2019; Bice and Kroll 2021). The (non-) production of DO clitics and the repetition of nonwords seem to target linguistic elements with little variation even among this group of participants, thus making the results on their efficiency as clinical markers even stronger.

5. Conclusions

The study tested the production of DO clitic pronouns and the repetition of nonwords in adult heritage speakers of Italian living in Scotland. Through the exploration of accuracy and qualitative analysis on the clitic data, it was clear from our results that the language of heritage speakers of Italian immersed in an English-speaking country is mostly structurally accurate but greatly disprefers the use of the clitic pronoun. On the other hand, the repetition of nonwords which follow Italian phonotactic rules is a strength in this group of healthy adult individuals.

The main goal of the present study was to provide initial benchmark data on the behavior of adult bilinguals on their non-dominant language as tested through clinical markers of DLD for that language. This is relevant in the landscape of current research on bilingualism and language impairment, due to the importance of moving away from testing against a monolingual standard of language, as well as the need to have efficient clinical resources for every bilingual situation. Taking the example of Vender et al. (2016), who had a similar goal for bilingual children in their dominant language, we tested the production of clitic pronouns in Italian and the repetition of nonwords. For the purposes of our study, we take these results as first indications of what to expect from the mature language system of typical bilingual speakers of Italian, particularly if Italian is their non-dominant language. The repetition of nonwords following Italian phonotactic rules in this population in the absence of impairment was high and may thus be considered as a potentially valid clinical marker for adults (and, potentially, children) with a similar bilingual background. On the other hand, the language-specific clinical marker of clitic pronoun production marked an area in which the linguistic profile of adult heritage speakers differs from that of speakers who grew up in the homeland. Qualitative analyses are also not determining in distinguishing the two profiles. For this reason, data we have so far suggest that caution should be used when using this marker in language assessments of children (and adults) for whom Italian is the non-dominant language. Future research should focus on checking these conclusions in both heritage children, to have a longitudinal perspective on these markers in the population, and bilingual DLD, in order to continue the endeavor to select the most efficient markers for language impairment in bilingual populations with different linguistic histories.

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References

Argyri, Efrosyni, and Antonella Sorace. 2007. Crosslinguistic influence and language dominance in older bilingual children. *Bilingualism: Language and Cognition* 10: 79–99. [CrossRef]

Armon-Lotem, Sharon, John H. De Jong, and Natalia Meir, eds. 2015. *Assessing Multilingual Children: Disentangling Bilingualism from Language Impairment*. Bristol: Multilingual Matters.

Arosio, Fabrizio, Chiara Branchini, Lina Barbieri, and Maria Teresa Guasti. 2014. Failure to produce direct object clitic pronouns as a clinical marker of SLI in school-aged Italian speaking children. *Clinical Linguistics & Phonetics* 28: 639–63. [CrossRef]

Baddeley, Alan. 2003. Working memory and language: An overview. *Journal of Communication Disorders* 36: 189–208. [CrossRef]

Bedore, Lisa M., and Laurence B. Leonard. 2001. Grammatical morphology deficits in Spanish-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research* 44: 905–24. [CrossRef]

Belletti, Adriana, and Cornelia Hamann. 2004. On the L2/bilingual acquisition of French by two young children with different source languages. In *The Acquisition of French in Different Contexts: Focus on Functional Categories*. Edited by Philippe Prévost and Johanne Paradis. Amsterdam and Philadelphia: John Benjamins Publishing Company, pp. 147–74. [CrossRef]

Benmamoun, Elabbas, Silvina Montrul, and Maria Polinsky. 2013. Heritage languages and their speakers: Opportunities and challenges for linguistics. *Theoretical Linguistics* 39: 129–81. [CrossRef]

Bianchi, Giulia. 2012. Gender in Italian-German bilinguals: A comparison with German L2 learners of Italian. *Bilingualism: Language and Cognition* 16: 538–57. [CrossRef]

Bice, Kinsey, and Judith F. Kroll. 2021. Grammatical processing in two languages: How individual differences in language experience and cognitive abilities shape comprehension in heritage bilinguals. *Journal of Neurolinguistics* 58: 100963. [CrossRef]

Bishop, Dorothy V. M. 2003. *Test for the Reception of Grammar—Version 2 (TROG-2)*. London: Pearson.

Bishop, Dorothy V. M. 2017. Why is it so hard to reach agreement on terminology? *The case of developmental language disorder (DLD). International Journal of Language & Communication Disorders* 52: 671–80.

Bishop, Dorothy V. M., Tony North, and Chris Donlan. 1996. Nonword repetition as a phenotypic marker for inherited language impairment: Evidence from a twin study. *Journal of Child Psychology and Psychiatry* 37: 391–42. [CrossRef]

Blom, Elena, Tessel Boerma, and Jan De Jong. 2019. First Language Attrition and Developmental Language Disorder. In *Oxford Handbook of Language Attrition*. Edited by Monika S. Schmid and Barbara Köpke. Oxford: Oxford University Press, pp. 108–20. [CrossRef]

Bortolini, Umberta, M. Cristina Caselli, Patricia Deevy, and Laurence B. Leonard. 2002. Specific language impairment in Italian: The first steps in the search for a clinical marker. *International Journal of Language & Communication Disorders* 37: 77–93. [CrossRef]

Bortolini, Umberta, Barbara Arfé, M. Cristina Caselli, Luisa Degasperi, Patricia Deevy, and Laurence B. Leonard. 2006. Clinical markers for specific language impairment in Italian: The contribution of clitics and non-word repetition. *International Journal of Language & Communication Disorders* 41: 695–712. [CrossRef]

Brown, Roger. 1973. Development of the first language in the human species. *American Psychologist* 28: 97. [CrossRef]

Cardinaletti, Anna, and Michael Starke. 1999. The typology of structural deficiency: A case study of the three classes of pronouns. In *Clitics in Languages of Europe 8*. Edited by Henk van Riemsdijk. Berlin: Mouton de Gruyter, pp. 145–233. [CrossRef]

Casalini, Claudia, Daniela Brizzolara, Anna Chilosi, Paola Cipriani, Stefania Marcolini, Chiara Pecini, Silvia Roncoli, and Cristina Burani. 2007. Non-word repetition in children with specific language impairment: A deficit in phonological working memory or in long-term verbal knowledge? *Cortex* 43: 769–76. [CrossRef]

Cecchetto, Carlo, Alberto di Domenico, Maria Garraffa, and Costanza Papagno. 2012. *Comprendo. Batteria per la Comprensione di Frasi negli Adulti*. Milano: Raffello Cortina Editore.

Conti-Ramsden, Gina. 2003. Processing and linguistic markers in young children with specific language impairment (SLI). *Journal of Language, Speech, and Hearing Research* 46: 1029–37. [CrossRef]
Cornoldi, Cesare, Lidio Miato, Adriana Dal Molin, and Silvana Poli. 2009. *PRCR-2/2009. Prove di Prerequisito per la Diagnosi delle Difficoltà di Lettura e Scrittura*. Firenze: Giunti.
Cuza, Alejandro, and Nelleke Strik. 2012. Patterns of morphosyntactic convergence and child L1 attrition: Evidence from subject-verb inversion in Spanish-English bilingual children. In *Linguistic Symposium on Romance Languages (LSRL42)*. Cedar City: Southern Utah University.
Dollaghan, Chris, and Thomas F. Campbell. 1998. Nonword repetition and child language impairment. *Journal of Speech, Language, and Hearing Research* 41: 1136–46. [CrossRef]
Dromi, Esther, Laurence B. Leonard, Galit Adam, and Sara Zadunaisky-Ehrlich. 1999. Verb agreement morphology in Hebrew-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research* 42: 1414–31. [CrossRef]
Fenyvesi, Anna. 2005. Hungarian in the United States. In *Hungarian Language Contact outside Hungary: Studies on Hungarian as a Minority Language*. Edited by Anna Fenyvesi. Amsterdam and Philadelphia: John Benjamins Publishing Company, pp. 265–318.
Ferrari, Ida. 2006. Acquisition of object clitics in Italian by two German/Italian bilingual children. In *Language Acquisition and Development*. Proceedings of GALA 2005. Cambridge: Cambridge Scholars Publishing, pp. 173–83.
Fishman, Joshua A. 2001. 300-plus years of heritage language education in the United States. In *Heritage Languages in America: Preserving a National Resource*. Edited by Joy Kreeft Peyton, Donald A. Ranard and Scott McGinnis. Washington, DC and McHenry: Center for Applied Linguistics and Delta Systems, pp. 81–97.
Garraffa, Maria, Maria Vender, Antonella Sorace, and Maria T. Guasti. 2019. Is it possible to differentiate multilingual children and children with developmental language disorder? *Languages, Society and Policy*. [CrossRef]
Genesee, Fred, Johanne Paradis, and Martha Crago. 2004. *Dual Language Development and Disorders: A Handbook on Bilingualism and Second Language Learning*. Baltimore: Brookes Publishing.
Granfeldt, Jonas, and Suzanne Schlyter. 2004. Cliticisation in the acquisition of French as L1 and L2. In *The Acquisition of French in Different Contexts: Focus on Functional Categories*. Edited by Philippe Prévost and Johanne Paradis. Amsterdam and Philadelphia: John Benjamins Publishing Company, pp. 333–70.
Grimm, Angela, and Petra Schulz. 2014. Specific language impairment and early second language acquisition: The risk of over- and underdiagnosis. *Child Indicators Research* 7: 821–41. [CrossRef]
Guasti, Maria T., Silvia Palma, Elisabetta Genovese, Paolo Stagi, Gabriella Saladini, and Fabrizio Arosio. 2016. The production of direct object clitics in pre-school–and primary school–aged children with specific language impairments. *Clinical Linguistics & Phonetics* 30: 663–78. [CrossRef]
Hamann, Cornelia. 2012. Bilingual development and language assessment. In *Proceedings of BUCLD 36*. Edited by Alia K. Biller, Esther Y. Chung and Amelia E. Kimball. Somerville: Cascadilla Press, pp. 1–28.
Hamann, Cornelia, and Adriana Belletti. 2006. Developmental patterns in the acquisition of complement clitic pronouns: Comparing different acquisition modes with an emphasis on French. *Rivista di Grammatica Generativa* 31: 39–78.
Hamann, Cornelia, Stéphanie Ohayon, Sébastien Dubé, Ulrich H. Frauenfelder, Luigi Rizzi, Michal Starke, and Pascal Zesiger. 2003. Aspects of grammatical development in young French children with SLI. *Developmental Science* 6: 151–58. [CrossRef]
Hulk, Aafke, and Natascha Müller. 2000. Bilingual first language acquisition at the interface between syntax and pragmatics. *Bilingualism: Language and Cognition* 3: 227–44. [CrossRef]
Jakubowicz, Celia. 1984. On markedness and binding principles. In *Proceedings of NELS 14*. Edited by Charles Jones and Peter Sells. Amherst: GLSA UMass/Amherst, pp. 154–82.
Jakubowicz, Celia, Lea Nash, Catherine Rigaut, and Christophe-Loic Gerard. 1998. Determiners and clitic pronouns in French-speaking children with SLI. *Language Acquisition* 7: 113–60. [CrossRef]
Kayne, Richard S. 1975. *French Syntax: The Transformational Cycle*. Cambridge: The MIT Press.
Kupisch, Tanya, and Jason Rothman. 2018. Terminology matters! Why difference is not incompleteness and how early child bilinguals are heritage speakers. *International Journal of Bilingualism* 22: 564–82. [CrossRef]
Laleko, Oksana, and Maria Polinsky. 2016. Between syntax and discourse: Topic and case marking in heritage speakers and L2 learners of Japanese and Korean. *Linguistic Approaches to Bilingualism* 6: 396–439. [CrossRef]
Leonard, Laurence B. 1998. *Children with Specific Language Impairment*. Cambridge: The MIT Press.
Leonard, Laurence B. 2014. *Children with Specific Language Impairment*, 2nd ed. Cambridge: The MIT Press.
Leonard, Laurence B., and Umberta Bortolini. 1998. Grammatical morphology and the role of weak syllables in the speech of Italian-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research* 41: 1363–74. [CrossRef]
Leonard, Laurence B., and Marco Dispaldro. 2013. The effects of production demands on grammatical weakness in Specific Language Impairment: The case of clitic pronouns in Italian. *Journal of Speech Language and Hearing Research* 56: 1272–86. [CrossRef]
Leonini, Chiara. 2006a. Object clitics and determiners in the acquisition of Italian as L1 and L2. In *Language Acquisition and Development*. Proceedings of Gala 2005. Newcastle upon Tyne: Cambridge Scholars Press, pp. 343–48.
Leonini, Chiara. 2006b. The Acquisition of Object Clitics and Definite Articles. Ph.D. dissertation, University of Siena, Firenze, Italy.
Madsen, Christen N., II. 2018. De-Centering the Monolingual: A Psychophysiological Study of Heritage Speaker Language Processing. Ph.D. dissertation, City University of New York, New York, NY, USA.

Marian, Viorica, Henrike K. Blumenfeld, and Margarita Kaushanskaya. 2007. The Language Experience and Proficiency Questionnaire (LEAP-Q): Assessing language profiles in bilinguals and multilinguals. *Journal of Speech, Language, and Hearing Research* 50: 940–67. [CrossRef]
McKee, Cecile. 1992. A comparison of pronouns and anaphors in Italian and English acquisition. *Language Acquisition* 2: 21–54. [CrossRef]
Montgomery, James W. 2003. Working memory and comprehension in children with specific language impairment: What we know so far. *Journal of Communication Disorders* 36: 221–31. [CrossRef]
Montrul, Silvina. 2008. *Incomplete Acquisition in Bilingualism: Re-Examining the Age Factor*. Amsterdam: John Benjamins Publishing. [CrossRef]
Montrul, Silvina. 2016. *The Acquisition of Heritage Languages*. Cambridge: Cambridge University Press. [CrossRef]
Müller, Natascha, and Aafke Hulk. 2001. Crosslinguistic influence in bilingual language acquisition: Italian and French as recipient languages. *Bilingualism: Language and Cognition* 4: 1–21. [CrossRef]
Padilla José, A. 1990. *On the Definition of Binding Domains in Spanish: Evidence from Child Language*. Dordrecht: Kluwer Academic Publishers.
Paradis, Johanne. 2004. On the relevance of specific language impairment to understanding the role of transfer in second language acquisition. *Applied Psycholinguistics* 25: 67–82. [CrossRef]
Paradis, Johanne. 2010. The interface between bilingual development and specific language impairment. Keynote article for special issue with peer commentaries. *Applied Psycholinguistics* 31: 3–28. [CrossRef]
Paradis, Johanne, and Martha Crago. 2000. Tense and Temporality: A Comparison between Children Learning a Second Language and Children with SLI. *Journal of Speech, Language, and Hearing Research* 43: 834–47. [CrossRef]
Peirce, Jonathan, Jeremy R. Gray, Sol Simpson, Michael MacAskill, Richard Höchenberger, Hiroyuki Sogo, Erik Kastman, and Jonas Kristoffer Lindeløv. 2019. PsychoPy2: Experiments in behavior made easy. *Behavior Research Methods* 51: 195–203. [CrossRef]
Polinsky, Maria. 2011. Reanalysis in adult heritage language: New evidence in support of attrition. *Studies in Second Language Acquisition* 33: 305–28. [CrossRef]
Polinsky, Maria. 2018. *Heritage Languages and Their Speakers*. Cambridge: Cambridge University Press.
Polinsky, Maria, and Gregory Scontras. 2020. Understanding heritage languages. *Bilingualism: Language and Cognition* 23: 4–20. [CrossRef]
R Core Team. 2020. *R: A Language and Environment for Statistical Computing*. Vienna: R Foundation for Statistical Computing, Available online: https://www.R-project.org/ (accessed on 15 May 2020).
Rice, Mabel L. 2004. Growth Models of Developmental Language Disorders. In *Developmental Language Disorders: From Phenotypes to Etiologies*. Edited by Mabel L. Rice and Steven F. Warren. Mahwah: Erlbaum, pp. 214–47. [CrossRef]
Rice, Mabel L., and Kenneth Wexler. 1996. Toward tense as a clinical marker of specific language impairment in English-speaking children. *Journal of Speech, Language, and Hearing Research* 39: 1239–57. [CrossRef]
Rogers, Vivienne. 2010. Syntactic Development in the Second Language Acquisition of French by Instructed English Learners. Ph.D. dissertation, Newcastle University, Newcastle, UK. Available online: http://theses.ncl.ac.uk/jspui/handle/10443/3168 (accessed on 12 February 2022).
Romano, Francesco. 2020. Ultimate attainment in heritage language speakers: Syntactic and morphological knowledge of Italian accusative clitics. *Applied Psycholinguistics* 41: 347–80. [CrossRef]
Romano, Francesco. 2021. L1 versus Dominant Language Transfer Effects in L2 and Heritage Speakers of Italian: A Structural Priming Study. *Applied Linguistics* 42: 945–69. [CrossRef]
Rothman, Jason. 2009. Understanding the nature and outcomes of early bilingualism: Romance languages as heritage languages. *International Journal of Bilingualism* 13: 155–63. [CrossRef]
Schaeffer, Jeanette C. 2000. *The Acquisition of Direct Object Scrambling and Clitic Placement: Syntax and Pragmatics*. Amsterdam: John Benjamins Publishing, vol. 22. [CrossRef]
Schmid, Monika S. 2011. *Language Attrition*. Cambridge: Cambridge University Press, Available online: https://www.google.com/books?hl=en&lr=&id=hZCXdKKuGX0C&oi=fnd&pg=PR7&dq=Schmid,+Monika+S.+2011.+Language+Attrition.+Cambridge+University+Press&ots=bu7Wgw6Ek9&sig=Bo597fhjSgDNpAufD7-2ew6rlkI (accessed on 12 February 2022).
Schmitz, Katrin, and Anna-Lena Scherger. 2019. Effects of age and education on variable but native heritage grammars: Theoretical and empirical implications for the Null Subject Parameter. *Applied Linguistics Review* 10: 443–67. [CrossRef]
Schmitz, Katrin, Laura Di Venanzio, and Anna-Lena Scherger. 2016. Null and overt subjects in Italian and Spanish heritage speakers in Germany. *Lingua* 180: 101–23. [CrossRef]
Scontras, Gregory, Maria Polinsky, and Zuzanna Fuchs. 2018. In support of representational economy: Agreement in heritage Spanish. *Glossa: A Journal of General Linguistics* 3: 1. [CrossRef]
Serratrice, Ludovica, Antonella Sorace, and Sandra Paoli. 2004. Crosslinguistic influence at the syntax–pragmatics interface: Subjects and objects in English–Italian bilingual and monolingual acquisition. *Bilingualism: Language and Cognition* 7: 183–205. [CrossRef]
Sorace, Antonella. 2011. Pinning down the concept of "interface" in bilingualism. *Linguistic Approaches to Bilingualism* 1: 1–33. [CrossRef]
Sorace, Antonella, and Francesca Filiaci. 2006. Anaphora resolution in near-native speakers of Italian. *Second Language Research* 22: 339–68. [CrossRef]

Tedeschi, Roberta. 2008. Referring expressions in early Italian: A study on the use of lexical objects, pronouns and null objects in Italian pre-school children. *LOT Occasional Series* 8: 201.

Thordardottir, Elin. 2015. Proposed diagnostic procedures for use in bilingual and cross-linguistic contexts. In *Assessing Multilingual Children: Disentangling Bilingualism from Language Impairment*. Edited by Sharon Armon-Lotem, Jan de Jong and Natalia Meir. Bristol: Multilingual Matters, pp. 331–58.

Tomblin, Bruce J., Nancy L. Records, Paula Buckwalter, Xuyang Zhang, Elaine Smith, and Marlea O'Brien. 1997. Prevalence of Specific Language Impairment in kindergarten children. *Journal of Speech, Language, and Hearing Research* 40: 1245–60. [CrossRef]

Tuller, Laurice, Hélène Delage, Cécile Monjauze, Anne-Gaëlle Piller, and Marie-Anne Barthez. 2011. Clitic pronoun production as a measure of atypical language development in French. *Lingua* 121: 423–41. [CrossRef]

Tuller, Laurice, Cornelia Hamann, Solveig Chilla, Sandrine Ferré, Eléonore Morin, Philippe Prevost, Christophe Dos Santos, Lina Abed Ibrahim, and Racha Zebib. 2018. Identifying language impairment in bilingual children in France and in Germany. *International Journal of Language & Communication Disorders* 53: 888–904. [CrossRef]

Vender, Maria, Maria Garraffa, Antonella Sorace, and Maria T. Guasti. 2016. How early L2 children perform on Italian clinical markers of SLI: A study of clitic production and nonword repetition. *Clinical Linguistics & Phonetics* 30: 150–69. [CrossRef]

Vernice, Mirta, Fabrizio Arosio, Chiara Branchini, Lina Barbieri, Elena Roncaglione, Eleonora Carravieri, Heather KJ Van Der Lely, and Maria Teresa Guasti. 2013. CLAD-ITA GAPS: Un test di screening delle abilità fonologiche e morfo-sintattiche in bambini con un Disturbo Specifico del Linguaggio. *Psicologia clinica Dello Sviluppo* 17: 291–314. [CrossRef]

Wexler, Kenneth. 1994. Optional infinitives, head movement and the economy of derivations. In *Verb Movement*. Edited by David Lightfoot and Norbert Hornstein. Cambridge: Cambridge University Press, pp. 305–50.

White, Lydia. 1996. Clitics in L2 French. In *Generative Perspectives on Language Acquisition*. Edited by Harald Clahsen. Amsterdam: John Benjamins Publishing Company, pp. 335–68.

Yip, Virginia, and Stephen Matthews. 2000. Syntactic transfer in a Cantonese–English bilingual child. *Bilingualism: Language and Cognition* 3: 193–208. [CrossRef]

Zirnstein, Megan, Kinsey Bice, and Judith Kroll. 2019. Variation in language experience shapes the consequences of bilingualism. In *Bilingualism, Executive Function, and Beyond: Questions and Insights*. Edited by Irina A. Sekerina, Lauren Spradlin and Virginia Valian. Amsterdam: John Benjamins Publishing Company, pp. 35–47.