50. Complete acquisition in the heritage language: Evidence from indefiniteness in Turkish[1]

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Abstract

This study investigates whether adult Turkish heritage speakers are able to refer to entities in discourse as required by semantic contexts. The focus is on the contrasting properties of Turkish (L1) and German (L2) with respect to semantics of indefiniteness, i.e., specificity and partitivity. Turkish morphologically distinguishes between specific/nonspecific and partitive/nonpartitive contexts on the indefinite direct object while German does not. We hypothesized that the Turkish heritage speakers would overgeneralize the unmarked form (*bir* noun) since this is the default form used in German regardless of the context and also acceptable in all contexts in Turkish. We further hypothesized that, if they ever opt for the case marked form (*bir* noun+acc), they would also do so incorrectly in nonpartitive and nonspecific contexts. Turkish heritage speakers living in Germany (n= 35) could dissociate semantic contexts and made similar preferences to those of monolingual native speakers of Turkish (n= 30). Our findings suggest that native language (L1) can develop despite early onset of the L2 and be maintained on a par with monolingual norms despite the presence of competing structures in the L2. We will discuss how insights from heritage language development can contribute to discussions about the bilingual's ability in L1; and limits and possibilities of bilingualism.

Keywords: Heritage grammar, indefiniteness, specificity, partitivity

Miras dilinde tam öğrenme: Türkçede belirsizlikten kanıt

Öz

Bu çalışma, yetişkin olan Türkçe miras dili konuşmacılarının söylemdeki varlıklara anlamsal bağlamlarının gerektirdiği şekilde atıfta bulunup bulunamadıklarını araştırmaktadır. Çalışmanın odak noktası Türkçe ve Almanca'nın belirtisizliğin anlambilimi açısından, yani spesifik ve bölümsel belirtisizlik açısından zıt özelliklere sahip olmalarıdır. Türkçe morfolojik olarak belirtisiz nesne üzerinde spesifik/spesifik olmayan ve bölümsel/bölümsel olmayan bağlamlar arasında ayrım yaparken, Almanca'da bu ayrım yoktur. Bu hali hazırdaki varsayılan form (bir noun) Almanca'da bağlam farketmeksizin kullanılan ve doğru varsayılan bir form olduğu için ve ayrıca Türkçe'deki tüm bağlamlarda kabul edilebildigi için, bu formun konuşmacilar tarafından aşırı genellmeyle

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kullanacağını tahmin ettik. Ayrıca ismin -i halindeki 'bir' formu seçecek olurlarsa (bir noun+acc) bunu bölümsel ve spesifik olmayan bağlamlarda yanlış kullanacaklarını tahmin ettik. Almanya'da yaşayan Türkçe miras dil konuşmacıları (sayı=35) anlamsal bağlamları ayırmak konusunda ve yaptıkları tercihler açısından sadece Türkçe konuşan tekdillilere (sayı=30) benzer sonuclar gösterdiler. Çalışmamız erken yabancı dil öğrenilmeye başlanmasına ve yabancı dildeki yapının anadildekinden farklı olmasına rağmen anadil öğreniminin tekdili Türkçe olanlar gibi olduğuna işaret etmektedir. Miras dil gelişiminden elde edilen bu içgörülerin iki dillinin birinci dildeki yeteneği hakkındaki tartışmalara nasıl katkıda bulunabileceğini ve iki dilliliğin sınırlarını ve getirdiği olanakları tartışacağız.

Anahtar kelimeler: Miras dili, belirtisizlik, spesifiklik, bölümsellik

1. Introduction

In the present paper, we are interested in a language skill that is integral to successful communication: the ability to refer to entities and individuals in discourse. Consider the following discourse:

1. Selin met *some students* in the corridor and she greeted *the student*. She, then went into the library and borrowed *a book*. Now she is reading *a book*.

The person Selin greeted cannot be identified by the listener because this person could be any one in this student group mentioned and the sentence is vague unless the speaker provides the identifying feature unique to the student as in 2. The listener also expects a clarification as to why s/he was informed about the first book or further explanation about the book that is being read as in 2:

2. Selin met *some students* in the corridor and she greeted *the student* that was in her chemistry class the previous year. She, then went into the library and borrowed *a book*. Now she is reading *the book*.

The above examples indicate how crucial proper identification of referents is for the addressee to understand the speaker's intended message and also for the speaker to structure his/her upcoming discourse. This involves multiple decisions which need to be made rapidly enough to keep up with the pace of normal conversation, which is about 50 times a minute, roughly once every second[4]. In order to make correct decisions. the speaker needs to know which linguistic forms are allowed in the language, how accessible referents are in the discourse for the interlocutor and what the interlocutor is attending during the conversation.

This issue is particularly interesting for research on bilinguals whose languages make use of different devices to encode referentiality because exploring reference management can provide us with valuable insight into knowledge integration and information management (Tomlin, Forrest, Pu & Kim 1997:77). We investigate Turkish heritage speakers' knowledge of referents in (non)specific and (non)partitive indefinite contexts. Since L1 Turkish and L2 German show a contrast in certain semantic aspects of these contexts, this will allow us to find out whether full mastery in this domain is possible despite German which has been acquired early in childhood and (often) becomes the dominant language for most speakers.

[4] On average, speech rate is about 200 words per minute (Krause & Braida, 2002); assuming around 25% of the words are nouns, we produce approximately 50 nouns per minute and hence as many decisions about referentiality.

Broadly defined, heritage speakers (HSs) are early bilinguals whose native language is not the wider society's national language (Valdés, 2000). Typically, they are second generation immigrants, children of the first generation immigrants living in a bilingual environment from birth or early age. In most cases, their early language experience is limited to their immediate environment and naturally their time is divided between the two languages, which inevitably results in less time spent interacting in the L1 compared to their peers in monolinguals contexts. They acquire their native language from birth onwards in the family via naturalistic input as in any case of child language acquisition but it is common for them to gradually shift to the societal language as they get older and socialize in the wider society and often become dominant in the L2. Research conducted on HSs so far has demonstrated that heritage grammars do not totally converge with the monolingual standards and in particular when the exposure to L2 starts in early years, they tend to lag behind the monolingual speakers during adolescence. Since (pre)puberty is a sensitive period for development/consolidation of language skills, early onset of L2 is associated with more divergence from the native norms and typical end state of HSs is one of imperfect language acquisition (Montrul, 2008; Polinsky, 2018). Several groups of HSs have been repeatedly found to have difficulties in the knowledge and use of inflectional morphology, complex syntactic structures, vocabulary, pronunciation and phonology (Spanish in the US - Rothman et al. 2016; Brazilian Portugese - Rothman, 2007; Russian in the US – Polinsky, 2016; Norwegian in the US - Lohndal & Westergaard, 2016; German in the US - Hopp & Putnam, 2015; Korean in the US - O'Grady et al. 2001) except in the gender system in heritage Scandinavian languages (Johannessen & Larsson, 2018).

Existing research has shown that language use and dominance in a broad sense plays a central role in the vulnerability of grammars of speakers who are not very competent users of their HL (Kupisch, 2007; Kupisch & Rothman, 2016; Montrul & Ionin 2012; Tsimpli, 2014); however, less is known about the higher proficiency HSs who have managed good mastery in the language (e.g., speakers of heritage Turkish, Russian, Italian and Polish in Europe) either due to family language policies or presence of bilingual schools and availability of language courses. The group under investigation is known to be at the upper ends of the proficiency continuum in their heritage language. They are characterized by extensive L1 use and willingness to preserve their language in bilingual contexts; however, they display occasional cross-linguistic influence (e.g., code-switches and lexical borrowings; restructuring tendencies; and accented speech) (Backus, 2012; Backus et al. 2013; Boescheten, 2010; see Küppers et al., 2015 for an overview). For instance, they have been reported to accept L2 like options in pronoun binding (Gürel & Yılmaz, 2011), prefer L2-like word order patterns in embedded constructions (Onar-Valk, 2015), and have difficulties with evidentiality (Karayayla, 2018) and relative clause constructions (Treffers-Daller et al., 2007); but we do not know if there are nonconventional elements in their Turkish that might impede everyday communication. In the present study, we investigate a linguistic ability that is critical for successful communication, namely, referring to entities. We predicted that they would have difficulty coordinating at the syntax-discourse interface while choosing the correct referential forms because they could have lost their sensitivity to discourse factors in Turkish due to presence of German in their linguistic system. Despite their high proficiency in Turkish, we anticipated that they would choose the form that is acceptable in both Turkish and German more often and they would also make inappropriate choices because integrating different levels of linguistic knowledge at interfaces is difficult even for highly competent bilinguals due to cognitive load of bilingualism (Sorace, 2011; Tsimpli et al., 2004).

Previously, vulnerability of the interface structures has been mostly investigated with respect the licensing of null pronominals (e.g., persistent emergence of pro-drop in adult heritage Spanish -Polinsky

2016, divergent use of topic marking by heritage speakers of Japanese and Korean - Laleko & Polinsky, 2016). The difficulty of the acquisition of interface-related phenomena is apparent and seems to linger on during adulthood. As for the semantics of the article system, a very early case of non-target like use of the articles has been reported on adult Spanish HSs by Lipski (1993). They behaved like English speakers learning Spanish as L2. Following these early observations, Montrul and Ionin (2012) investigated the article contexts where Spanish and English differ. In Spanish, the HSs accepted ungrammatical bare plural NPs in generic and specific contexts (3a) and preferred specific interpretation of definite plurals (3b) while they demonstrated nativelike interpretations of articles in L2 English, which indicates significant transfer effects from dominant L2 English (p. 73):

3.	a. #Tigres comen carne.	Ungrammatical in Spanish
	'Tigers eat meat'	Generic, #Specific reference in English
	b. Los tigres comen carne.	Generic, Specific reference in Spanish
	the-pl eat meat	
	The tigers eat meat.	Specific reference in English

In discussions on the imperfect grammatical knowledge of HSs, insufficient exposure to the L1 has been proposed as another major factor besides interference from the L2. While some studies estimate around 40-60% of language exposure for the bilingual child, in order to catch up with the monolingual child, this cannot be generalized to all linguistic properties (see Unsworth, 2016). Therefore, it is hard to provide a definition for 'sufficient' input (de Houwer 2007; Carroll & Meisel, 2015). In order to discover what minimum amount of exposure would suffice, one should look at cases either where access to the target language is severely limited or a property in a language which occurs extremely rarely. In the contemporary age of globalization and media technologies with abundant opportunities for exposure to written and audio-visual language, there is hardly ever the problem of scarcity of language input for HSs. The Acc case marking that appears in indefinite contexts is surprisingly infrequent both in written and spoken discourse and yet comes with a critical discourse organization function. A 21 million word newspaper Milliyet Corpus revealed only 157 tokens of Acc marked indefinite referents[5] (Özge, in preparation). Another corpus, TS Corpus V2 composed from various internet forums, blogs and online newspapers and as large as 500 million words has less than 2000 tokens of Acc marked indefinite forms. Accuracy in this domain requires the knowledge of semantics (specific or nonspecific and partitive or nonpartitive) and the ability to map morphosyntactic features (case marked or unmarked referent). However, since partitive and specific information can often (if not always) be inferred from the context of conversation, Acc case is optional and its absence rarely leads to ambiguity, but its presence in nonspecific and nonpartitive contexts yields ungrammaticality. Apart from its rare occurrence and the fact that there is no equivalent form in L2 German, there are other complexities associated with this feature (further explained in section 3.2.1) that makes it intriguing to investigate its use with indefinite phrases. Given the complexities, we predicted that HSs would make a safe bet and choose the unmarked form since it is acceptable in all contexts and the equivalent form in German; and if they choose to use

[5] The count filtered out: (1) the cases where the indefinites are governed by non-extensional verbs (e.g., *seek, remind*) that induce a referential reading without any implication of familiarity or discourse linking function and, (2) the cases where the Acc case is required by morphological and syntactic constraints.

it at all, they would erroneously use it nonpartitive and nonspecific contexts as they are expected to have no awareness of contextual differences.

However, it turned out that participants of this study could differentiate between different semantic contexts like monolinguals and identify the correct discourse referents accordingly indicating that they make use of the same principles governing the referential choices. What our results preliminarily indicate is that heritage and monolingual native grammars are qualitatively similar and have similar mechanisms of encoding and decoding information at the discourse level. Although the present study cannot tell how HSs do this, the findings provide compelling evidence for the mind's remarkable ability for complex linguistic computations in the presence of two language systems and in particular, this opens up new lines of inquiry into the cognitive mechanisms that enable us to structure information flow in communication. The coming section presents a brief theoretical background that is aimed at demonstrating how indefiniteness, specificity and partitivity help organize presentation of knowledge in interactions. How these semantic features apply to Turkish and German will be comparatively addressed, too.

2. Theoretical background

Speakers make use of various mechanisms to relate new information to what has come before in order to achieve reference management because they are responsible to formulate their utterances according to the perspective of the hearer and the identifiability of the referents (Chafe, 1976; Givón, 1989). The morphosyntax and semantics of reference is very complex; in this paper, we are only concerned with specificity and partitivity in indefinite contexts. (In)definiteness is a semantic feature which asserts that there is no presupposition to the existence and the uniqueness of the referent. It doesn't make reference to the speaker's intention to refer to a particular entity, either (Heim, 1991; Ionin, 2003, 2006). Indefinites can have a specific and nonspecific interpretation.

2.1. Specificity

Specificity refers to the speaker's intention to refer to a unique individual where the intended referent is unfamiliar to the hearer (Fodor & Sag, 1982; Ionin, 2003, 2006; von Heusinger, 2002). Specificity is not morphologically marked in English but as illustrated in the examples below, it is inferred from the context. In (4a), the second part of the sentence makes it clear that the speaker is referring to a unique individual and this individual possesses some property that is noteworthy from the speaker's perspective unlike in (4b) where the speaker has no reference in mind. In specific contexts, the demonstrative *this* or the adjective *certain* can be used as in (4c) and when the speaker does not intend to refer to a particular individual, using *this* or *certain* is infelicitous from the hearer's standpoint/perspective as in (4d).

4. a. Peter intends to marry *a merchant banker* –even though he doesn't get on at all with her. *Spec.*

   b. Peter intends to marry a merchant banker –though he hasn't met one yet. *Nonspec.* (Lyons, 1999: 176)

   c. Peter intends to marry *a/this/a certain merchant banker* –even though he doesn't get on at all with her. *Spec.*

d. Peter intends to marry *a/#this/#a certain merchant banker* –though he hasn't met one yet. *Nonspec*. (Lyons 1999: 176)

We treat specificity as not identical to wide scope or existence in the actual world. All of the above sentences assert the existence of a banker in the actual world, but only the speaker in (4a) and (4c) has a particular individual in mind (Fodor & Sag, 1982) [6].

In Turkish, indefiniteness is encoded by the indefinite article *bir*, which corresponds to *a* in English. However, it must be unstressed; because otherwise it is considered a numeral (Kornfilt, 1997). Both direct objects below are indefinite yet, the one in (5) is specific and the one in (6) is non-specific. The specific object entails the speaker's certainty about the identity of the referent and is marked by the Acc case, *-(y)I*. They are called 'strong' or 'presuppositional' indefinites because while they behave like ordinary indefinites, they encode certain relations within sentence and the context they occur (Özge, 2011; von Heusinger & Kornfilt, 2005). However, it is not the case that all specific direct objects obligatorily take the Acc case because specificity can be inferred from the context as in English so bare indefinites do occur in specific contexts as in (5). However, nonspecific contexts allow only bare indefinites as in (6):

Specific:

5. Nihan *bir kedi / bir kediyi* almış. Çok enerjik bir Ankara kedisi; kulağında da doğum lekesi var.

   Nihan a cat / a cat -acc get-past-3rd pr sg

   'Nihan got a cat. It is a very energetic Angora cat and has a birthmark on the ear.

   Nonspecific:

6. Nihan *bir kedi / #bir kediyi* almış. Nasıl bir kedi olduğunu hiç bilmiyorum.

   Nihan a cat / #a cat-acc get-past-3rd pr sg

   'Nihan got a cat. I have no idea how it looks like.'

Since German does not morphologically encode specificity, German translation in (5) and (6) are exactly the same because indefinite objects uniformly take the indefinite article 'ein' that is inflected for gender (i.e., *ein/eine/einen*) regardless of the semantic context where they occur[7]. The only way to infer the correct interpretation is to deduce it from the context. It is possible to paraphrase the specific reading in Turkish by using the German adjective '*bestimmte':*

7. Nihan hat *eine bestimmte Katze* bekommen.

   'Nihan got *a certain cat*'

[6] Additionally, all contexts are 'extensional' in order to avoid the interaction between specificity and scope.
[7] Some masculine nouns take overt case marking (i.e., *einen Löwe**n**, einen Jung**en***) regardless of the semantic context.

Without *bir*, Acc case on the object carries the presuppositions that the object exists, it is unique, and identifiable by both the speaker and the hearer (8). It corresponds to the definite article *the* in English and *der/die/das* in German:

Specific, Definite:

8. Nihan *kedi-yi* almış.

   Nihan cat-acc get-past-3rd pr sg

   Nihan hat *die Katze* bekommen.

   'Nihan got *the cat*.'

2.2. Partitivity

Partitivity is established by introducing in the previous discourse a set of referents the target object belongs to. In (9) there is a contextually salient set of cats from which this cat is picked and this set should have been previously introduced in the discourse. This is similar to definiteness in terms of presupposition of existence except that partitivity does not entail the uniqueness of the entity (Enç, 1991; Diesing, 1992; Pesetsky, 1987).

9. Nihan dün gece bir *kedi-yi* beslemiş.

   'Last night Nihan fed one of the cats.'

A set of cats must have been mentioned prior to (9) in order to contextually restrict the identity of the cat:

10. Last night, three cats were whining on her street and Nihan fed *one of the cats*. The others were not hungry and just playing.

    The German translation includes an overt partitive (Diesing, 1992; de Hoop, 2003):

11. Letzte Nacht hat Nihan *eine der Katzen* gefüttert.

As in specificity, Turkish makes use of the Acc case marking on the object, *-(y)I*, in addition to the indefinite article *bir*, in order to differentiate between partitive and nonpartitive contexts[8]. Similar to specific contexts, it is optional in partitive contexts (12) and infelicitous in nonpartitive contexts (13):

Partitive:

[8] In addition to the Acc case, there are other mechanisms in Turkish for creating partitives such as by marking the superset of the partitive with genitive and ablative case and adding the possessive suffix - (s)I to the head.
e.g., a. Ali *köpekten* korktu.
Ali dog-Abl be afraid-3rd pr sg.
'Ali was afraid of the dog'.
b. *kalemin* kutu-su
pencil-gen box-3pr
'pencil box' (see Göksel & Kerslake, 2005 for details).
Since the present investigation is limited to the role of Acc case, these mechanisms are not further discussed here.

12. Nihan'ın iki şiir ve üç hikaye okuması gerekiyormuş; yorgun olduğu icin *bir şiir / bir şiiri* okumus.

    'Nihan had to read two poems and three stories; because she was tired she read *a poem / one of the*

    poems.'

    Nonpartitive:

13. Nihan'ın iki matematik ve beş geometri sorusu çözmesi gerekiyormuş ama *bir roman / #bir romanı* okumuş.

    'Nihan had to solve two maths and five geometry problems but she read *a novel / one of the novels*.'

We should note that partitivity is independent of specificity. It had been claimed that Turkish partitives are inherently specific due to referential status of the partitive subset to its definite superset (Enç,1991); however subsequent research has clearly demonstrated that Acc case does not automatically carry the feature specific and partitives are not necessarily specific (Özge, 2011; von Heusinger, 2002). This leads to four different contexts (i.e., partitivity by specificity, see examples 14-17 below), which forms the basis of the present investigation.

3. The Study

Our study was designed to answer the following research questions:

I. Do adult Turkish HSs demonstrate nativelike knowledge of referential forms in indefinite contexts? I.e., Are they able to choose Acc marked and unmarked forms as appropriately as the monolingual natives?

II. If they show variability, are they constrained by the semantics of specificity and partitivity or do they make random choices?

III. Can we identify any external factors predicting their language performance? I.e., language dominance and language use, age of L2 onset, education and attitudes.

3.1. Participants

The bilingual group investigated here consisted of thirty-five adult HSs of Turkish living in Germany. Thirty of them were born in Germany and five, who were born in Turkey, came to live in Germany before age four and were raised in predominantly Turkish speaking families. Their average age was 29.2 (range 19-54 years). All spoke the standard variety of Turkish. The reference group in Turkey consisted of monolingually raised speakers of Turkish who were matched with the experimental group on age, gender and level of education (see Table 1). The experiments and the background interviews were carried out by the first author of this paper in Turkish. The HSs were tested in Berlin and the reference group in Istanbul.

Table 1. Participant characteristics

		Heritage Speakers	Monolinguals
Birth place (%)	Turkey	5 (14.3)	30 (100)
	Germany	30 (85.7)	

L1 Mother (%)	Turkish	33 (94.3)	29 (96.7)
	German	1 (2.9)	
	Other	1 (2.9)	1 (3.3)
L1 Father (%)	Turkish	34 (97.1)	29 (96.7)
	German	1 (2.9)	
	Other		1 (3.3)
N		35	30
Females n (%)		27 (77.1)	21 (70)
Age (range)		29.2 (19-54)	28.1 (18-48)
Age of L2 onset (range)		3.1 (1-4)	
Educational level (%)	Secondary school	1 (2.9)	2 (6.7)
	High school	17 (48.6)	11 (36.7)
	University	15 (42.3)	17 (56.7)
	Masters, PhD	2 (5.8)	
Foreign language (%)	Advanced	9 (25.7)	0
	Intermediate	13 (37.1)	8 (26.7)
	Basic to none	13 (37.1)	23 (76.7)

3.2. Procedure

The participants were required to do an elicitation test where they were asked to choose their preferred form of the direct object (i.e., case marked indefinite, unmarked indefinite or definite). The presentation of the stimuli was controlled by the software e-prime and the Chronos serial response box (model PST-100430, serial number CHR-04302-1662). The participants used as much time as they needed to finish the test. In order to assess their proficiency, they were asked to retell a short film retell task, which was later transcribed to assess proficiency levels. Finally, a semi-structured autobiographical interview was conducted in the L1 in order to gather the relevant personal background data. The total testing time ranged from about an hour to an hour and a half. Participants were tested individually in a room and all sessions were recorded.

3.2.1. The elicitation test

A particularly fruitful approach to the study of the expression of indefiniteness and articles in general is to elicit monologic narratives from speakers or picture based stimuli, but in our case since case marked indefinites occur rarely in spontaneous data, we have chosen to give them a gapfill task (see Jaensch, 2008). The task was designed using similar categories to those used by Ionin, Ko and Wexler (2004).

Specificity by partitivity yields four semantic contexts and for each one, eight items were constructed leading to thirty-two items in total in Latin square design. The items were designed in the form of a dialogue so as to simulate the natural context of daily informal speech. The target form was replaced by a blank. The subjects were instructed to read the dialogue completely before making their choice among these three forms: Acc case marked indefinite, unmarked indefinite and the definite which is Acc marked[9].

In order to answer our research questions, four context types were included in the test. One example of each context type is given here. For concerns of space, English translations are presented here and Turkish forms are provided in italics. Correct responses are presented in bold.

The first context, 'Partitive, Specific' in (14), opens with the mention of a group consisting of thieves and the second mention of the referent establishes a group membership and signals that the referent belongs to this group that has been mentioned in the preceding discourse. The identity of the referent/*thief* is disambiguated by providing some explicit features indicating that his identity is known by the guard. Both **a** and **b** are acceptable responses. Since it has been suggested that textual distance might play a role in accessibility (Ariel, 1990), distance of the target objects from their previous mentions has been alike in all items in order to control for this. Also, the ambiguity arising from the presence of competitors in the discourse contexts was constructed similarly in all items (Arnold & Griffin, 2007).

Partitive, Specific:

Seda: I was shocked when heard it! Last night, several flats had been broken into in my mom's apartment! The security cameras had caught a glimpse of the four thieves entering through the garden gate with two dogs.

Ali: Interesting, thieves are making use of animals, too! But, did they not have security guards there?

Seda: Yes, a security guard had already seen _____ he was an athletic and good-looking guy. It hadn't occurred to him that he could be a thief.

a) ***bir hırsız***	b) ***bir hırsızı***	c) *hırsızı*
a thief	a thief-Acc	thief-Acc
a thief	one of the thieves/a certain thief	the thief

The second context is 'Partitive, Nonspecific' in (15), where a superset consisting of two novelists and three poets is introduced in the beginning and the poet seen by the mother is one of them, a part of this group; however, there is no specific information disambiguating the poet from the other alternatives, so it renders a nonspecific reading. Both **a** and **b** are acceptable responses because it is a partitive context:

[9] The definite form was included as a third option simply in order to increase the number choices to three and decrease the chance factor. We should also stress that it is not the expected answer in any of the dialogues because all contexts require indefinite forms and therefore the definite forms are ungrammatical.

5. Partitive, Nonspecific:

Father: You should have seen the bookshop on our street! It looked like a festival or something. Two famous novelists and three poets had come to sign their books. Everybody went to see them.

Daughter: Oh, mom just told about that and she had actually seen _____. I don't know which one but she got very excited about seeing someone very famous right here on the street.

a) ***bir şair***	b) ***bir şairi***	c) *şairi*
a poet	a poet-Acc	poet-Acc
a poet	one of the poets/a certain poet	the poet

In the other two contexts 'Nonpartitive, Specific' and 'Nonpartitive, Nonspecific' in (16) and (17), there is no previous mention of a group/superset of the target object/referent and the referents are introduced for the first time in discourse; therefore, they receive a nonpartitive reading. In the former, the speaker talks about a specific 'movie' she is familiar with and provides some brief description of the film, so both **a** and **b** are acceptable. In the latter, however, the speaker has not seen 'the animal' and has no idea about its identity, so **a** is the only allowed option:

6. Nonpartitive, Specific:

Aunt: Ebru must have been relieved after the exams. How is she doing?

Mother: Yes, definitely. She is having a very good time actually. Today she read a novel for hours and then she watched _____. It was a nostalgic Turkish movie with a happy end.

a) ***bir film***	b) ***bir filmi***	c) *filmi*
a movie	a movie-Acc	movie-Acc
a movie	one of the movies/a certain movie	the movie

7. Nonpartitive, Nonspecific:

Father: Apparently Murat had really missed the playground. He was on the swings for a long time and then slid down the slide several times.

Mother: Yeah, but why was he crying when you came back?

Father: He had seen _____ among the bushes and got so scared. It had gotten disappeared before I could see what it was.

a) ***bir hayvan***	b) *bir hayvanı*	c) *hayvanı*
an animal	an animal-Acc	animal-Acc
an animal	one of the animals/a certain animal	the animal

While constructing the dialogues, the following considerations were taken into account:

First, we controlled for word order by always placing the referent preverbally. Acc marked specific objects (18b) can move within the sentence while nonspecific objects must be in the position immediately preceding the verb (18a) (Erguvanlı, 1984; Gürel, 2000):

8. a) Nihan *bir roman / bir romanı / romanı* okudu.

Nihan a novel / a novel-Acc / novel-Acc read-past-3rd pr. sg

b) #Bir *roman* / Bir *romanı* / *Romanı* Nihan okudu.

a novel / a novel-Acc / novel-Acc Nihan read- past-3rd pr. sg

Second consideration was related to the selection of verbs. Verbs that syntactically require accusative case endings for their direct object (unless the direct object is a generic or indefinite noun) (i.e., a small class of transitive verbs) (19), verbs with which inanimate objects do not occur with the Acc case (e.g., verbs of propositional attitudes such as *look for, want*) (20) and causatives derived from intransitive verbs (because they tend to take Acc marked objects) (21) were avoided:

9. Küçük kız bana *annesini* hatırlatıyor.

Little girl I-Dat mother-gen-Acc remind-prog-3rd pr. sg

'The little girl *reminds* me of her mother'

10. #Bir *kitabı* / Bir *doktoru* arıyorum.

A book-Acc / A doctor-Acc look for-cont. 1st pr.sg

'I am looking for a (certain) book / a certain doctor.' (Dede, 1986)

11. Öğretmen bir *öğrenciyi* ağlattı.

Teacher a student-Acc make cry- past-3rd pr. sg

'The teacher made a (certain) student cry'

Thirdly, contexts where the presence of Acc case is not necessarily related to specificity and/or partitivity were avoided, too. Preverbal Acc marked objects can carry a generic meaning (indefinite and nonspecific) as in (22):

12. Mühendis mimarı kıskanır.

Engineer architect-Acc be jealous-Aorist-3rd pr.sg

'The engineer is usually jealous of the architect' (Göksel & Kerslake, 2005:383)

Finally, all of the dialogues have been constructed in the 'heard-indirect' past tense because 'seen-direct' past tense reveals familiarity with the referent[10]. It is mostly used when the speaker has witnessed the event and/or has first-hand knowledge of the referent and therefore a referent used in seen-direct past tense sentence would automatically be interpreted as specific. In the heard/reported tense, however, both specific and nonspecific interpretations are possible and therefore all test items are presented in the latter so that the syntactic context would not provide any clues/prime the participant towards a certain interpretation.

3.2.2. Background interview

The interview provided us with useful information about personal biography, language learning history and language use patterns. It was based on a questionnaire adopted from Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian et al., 2007) and the bilingual background questionnaire (Montrul, 2012). It had a total of sixty-four questions in different formats: open questions (e.g., birthplace and profession), Likert-scale questions (e.g., amount of language use), and interval questions (e.g., age of L2 onset) and was used by the researcher as the basis for a semi-structured interview (an overview of responses are presented in the supplementary material 1). The participants' responses revealed that Turkish is used on a regular basis and frequently and its use is prominent in the family and in particular with parents. The participants reported that they often speak Turkish and German with almost similar frequency with their siblings and friends with somewhat more preference for German. It was hard for some participants to decide on this because family and the social contexts are those where they code-switch without even noticing in which language they are speaking with other bilinguals. Nevertheless, Turkish seems to be predominantly the language with the parents and with siblings and friends they use both Turkish and German, the frequency of German use is often higher for most of the participants and in particular with friends. The use of Turkish at work is minimal and only those who work with Turkish colleagues and interact with Turkish clients use Turkish daily at work. German clearly is the language used the most at work for those who were employed (20 of them). The remaining 15 informants were university students all of whom studying in German universities with German as the language of instruction. They preferred German books, newspapers and German internet but they had enjoyed audiovisual entertainment media in both languages equally. Some participants had varying degrees of proficiency in English and some studied French and Spanish because foreign language education is part of the education system in German. Since English was the foreign language that they were most proficient in and most of them used it in daily life, so the variable 'the other language proficiency' referred to their English proficiency and other languages were not considered in the analyses. Some participants in the control group studied English during school years, too; but only three of them reported that they used English on a daily basis.

According to the self-reports, HSs' first exposure to German language ranges from age 1 to 4 (mean=3.1). Two of them had German parents, so for them, German was introduced along with Turkish from birth onwards; but all the others reported that their intensive exposure to German started with the daycare center or kindergarten. All participants have completed at least high school or university in the German education system except that four of the participants attended schools in Turkey at various levels of their academic life up to two years at most and one got his engineering degree at a Turkish university. Two of the participants attended a Turkish-German bilingual school and then studied in German universities. Throughout their primary and secondary school years, around half of the participants attended Turkish

[10] However, historical events, scientific inventions etc. are always expressed in the seen-direct past tense.

language and culture lessons. These were weekly lessons (ranging from one to three hours per week) and the duration of the classes ranged from 6 months to 4 years for those who participated in these classes. The rest of the informants learnt how to read and write from their parents. Since our experiment required them to be competent in reading in particularly, we made sure that all the participants were confident readers in Turkish.

Regarding their attitudes towards language and culture, about half of the participants reported that they felt equally confident in both languages, one third reported that they preferred German and only 7 participants stated a preference for Turkish. While this indicates an overall tendency towards the dominance of German, most participants stressed that comfort and ease of language use very much depended on the interlocutor and the topic. Where cultural orientation is concerned, about half of the group reported that they feel equally close to both cultures. The rest of the group reported preference for the L1 culture, either more or exclusive preference. Their attachment to ethnic culture is further revealed in their willingness to maintain the L1. Without any exception, all the informants stated that they considered it important to be able to speak and maintain the L1. Regarding their social connections, however, about half reported that they had more German speaking friends and 43% reported that they had equal number of Turkish and German speaking friends, while a very small proportion had more Turkish speaking friends (9%). They were asked with which language they felt more confident and which was easier for them to speak.

In order to have an objective evaluation of their language knowledge free-speech elicited through the retell of a twelve-minute excerpt from a silent film taken from the 'Modern Times' (1936) starring Charlie Chaplin and Paulette Goddard was assessed by two native Turkish raters, one of whom was the first author of this paper. The other rater did not receive any information about the purpose of the study or the background of the participants as to whether they are monolingual or bilingual speakers. The recordings were judged on five subcategories: fluency, pronunciation, intonation, syntax and lexicon separately for each speaker on a scale from 1 (very poor) to 10 (excellent) (Silva-Corvalán & Treffers-Daller, 2016). Interrater reliability for this combined score was high (kappa =0.91). The total scores were then averaged across the two raters to produce a mean total rating per individual. A mean score was calculated for each subcategory which led to the following mean ratings: lexical complexity=7.9, syntactic complexity=7.6, fluency=7.8, pronunciation=8.1, intonation=8.1, and total mean score=7.9. None of the participants was rated lower than 6 in any of the components by the judges so the figure starts from 6. The mean scores show that about 90% of the informants are classified above level 8 and performance remains quite high across skills except syntactic complexity where 34% of the participants were classified between 6-7 (see Figure 1).

Figure 1. Assessed proficiency in Turkish (% of speakers in each category): Averaged from the two raters

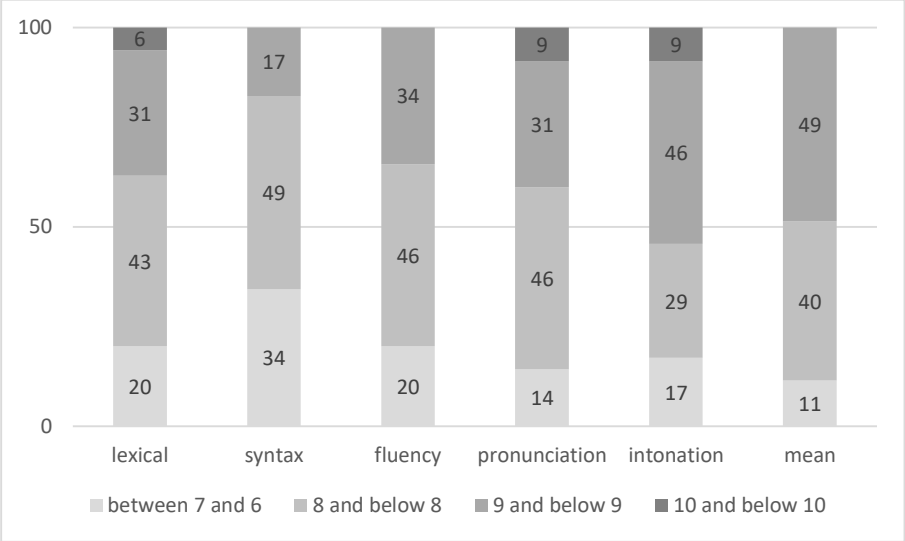

Figure 2. Self-rated proficiency in Turkish (% of speakers in each category)

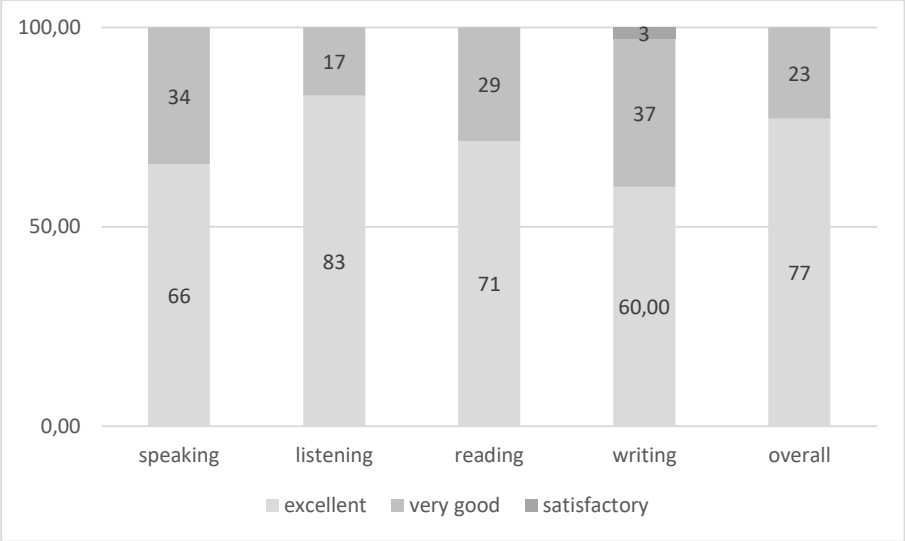

Figure 3. Self-rated proficiency in German (% of speakers in each category)

We also asked the participants to rate their proficiency in Turkish and in German as well. On a scale of 1–5 (where 1 = unsatisfactory, 2= satisfactory, 3= good, 4=very good and 5 =excellent) they rated themselves separately for speaking, understanding, reading and writing (see Figure 2 and 3). While mean self-assessed proficiency in German was higher in all the skills and almost all of them considered their German excellent with the exception of writing, there was no statistically significant difference between their proficiency in German and Turkish in general (mean=4.88 versus mean=4.65).

4. Data analyses

The data were analysed using the R-environment (R Core Team, 2017). Three sets of analyses were conducted. The first set is aimed at finding out whether Turkish HSs' referential skills in indefinite contexts are similar to those of monolingual natives (research question 1). Next come the analyses across semantic contexts in order to see to what extent their referential choices are constrained by the semantics of specificity and partitivity (research question 2). The third set of analyses is an attempt to identify external factors that could help us predict their knowledge of referential forms (question 3).

4.1. Accuracy

The first set of analyses examined the effects of partitivity and specificity on the choice of referential forms in the production data. Logit mixed effects models, using the lme4 package (version 1.1-18-1; Bates et al., 2015) were calculated to assess the fixed effects of partitivity, specificity and group, and random effects for participants on the proportion of responses. Contrast coding of the effects of partitivity (partitive: -0.5, nonpartitive: +0.5) and specificity (specific: +0.5, nonspecific: -0.5) resembled those traditional ANOVA analyses. The coding of the effect of group was a treatment contrast with the control group as baseline. Model fitting started with the full models including random slope adjustments for participants for the effects of partitivity and specificity and their interaction. Model reduction of the random slope structure was performed in a stepwise fashion using loglikelihood comparisons. A selected slope adjustment was retained in the model when it significantly improved model fit compared to the

model without the slope adjustment. Slope adjustment was not included for items given that different texts were used in the contexts.

Recall that partitive/specific, partitive/nonspecific and nonpartitive/specific contexts allow both Acc marked (*bir kediyi*) and unmarked forms (*bir kedi*); and nonpartitive/nonspecific contexts only allow bare forms. For the ease of presentation, in the rest of the paper, we refer to our categories as *bir kediyi* (a cat-Acc) for the Acc marked forms, *bir kedi* (a cat) for the unmarked forms. The third option *kediyi* (cat-Acc) is in fact incorrect in all contexts because it is definite.

Figure 4. Accuracy rate across contexts

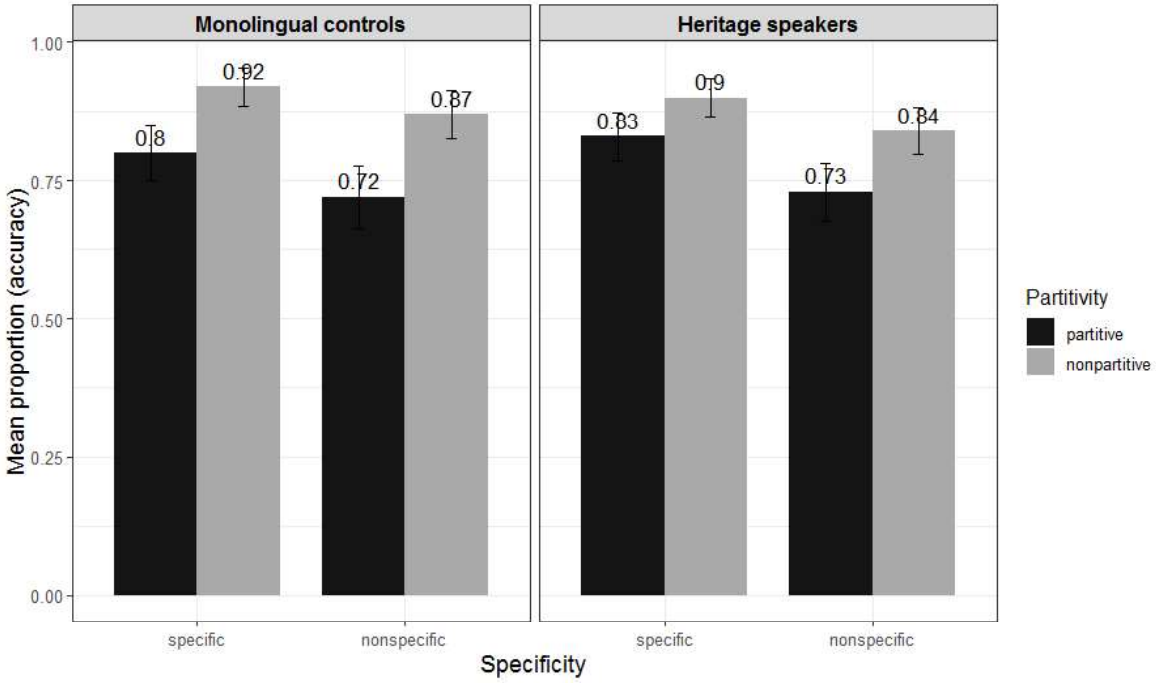

Figure 4 illustrates the mean proportion of the accurate responses in the specific and nonspecific context separately in the partitive (dark bars) and nonpartitive context (grey bars), for native (left panel) and HSs (right panel). As illustrated by the figure, the two groups did not differ from each other in the accuracy across different conditions. The models revealed show an effect of specificity, reflecting higher accuracy in the specific than non-specific contexts (b = 1.14, SE = 0.20, z = 5.813, p < .001)) and an effect of partitivity, reflecting higher accuracy in non-partitive than partitive context (b= 0.59, SE =0.19, z = 3.018, p = .00254), but neither an effect of group nor interactions.

4.2. Responses across semantic contexts

A second set of logit mixed-effects model was calculated to assess the fixed effects of partitivity and specificity and group and the random effects of participants on the proportions of three response types across different semantic contexts. Contrast coding and the model fitting were the same as for the analyses of accuracy mentioned above.

Figure 5. Mean proportion of responses

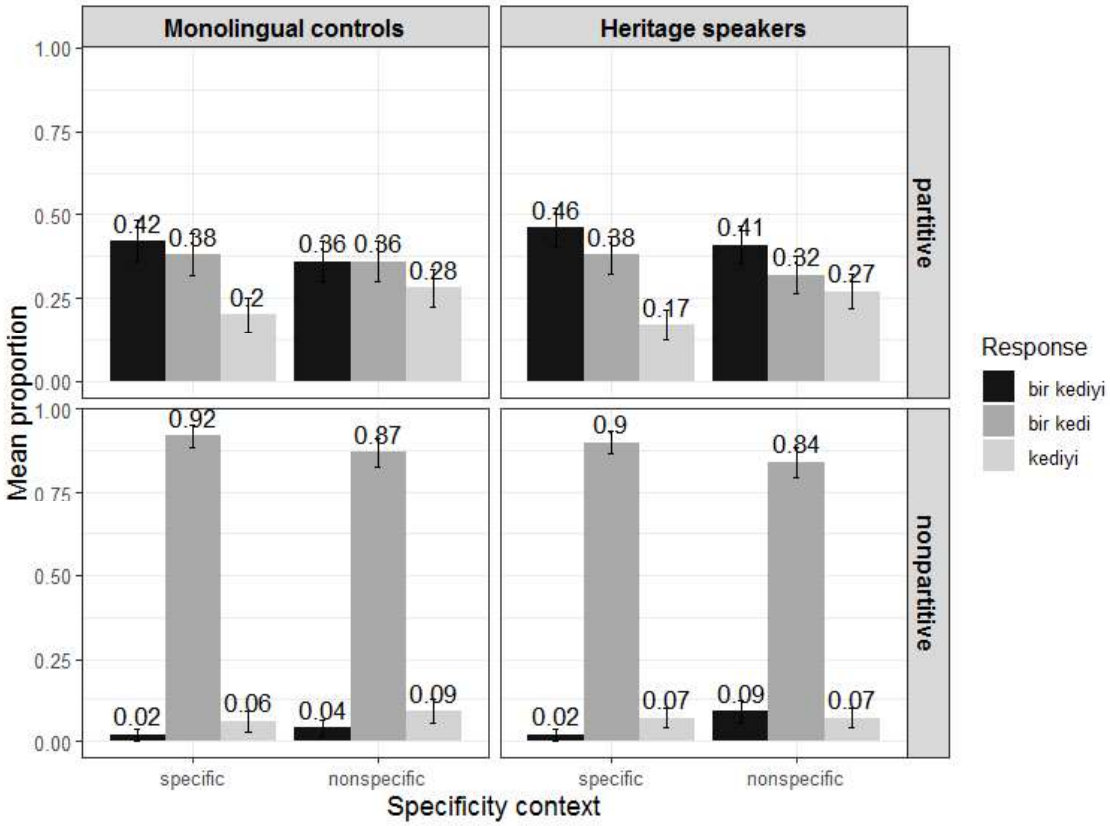

Table 2. Fixed effects of the models predicting the proportion of *bir kediyi*, *bir kedi* and *kediyi* responses in the control, heritage and conjoint model (significant values at α = .05, are indicated in bold) (Part: Partitivity, Spec: Specificity)

	Controls			Heritage			Control vs. Heritage		
	b	SE	z	b	SE	z	b	SE	z
bir kediyi									
Intercept	-2.26	0.25	-9.120	-1.96	0.24	-8.273	-2.25	0.24	1.061
Partitivity	-3.39	0.40	-8.522	-3.22	0.34	-9.357	-3.39	0.38	-8.837
Specificity	-0.22	0.30	-0.721	-0.61	0.25	-2.496	-0.22	0.30	-0.723
Part x Spec	-1.04	0.60	-1.728	-1.69	0.49	-3.437	-1.04	0.60	-1.726
Group							0.32	0.30	1.061
Group x Part							0.21	0.50	0.418
Group x Spec							-0.39	0.39	-1.017
Group x Part x Spec							-0.64	0.77	-0.832
Model	bir_kediyi ~ Part * Spec + (1 | Participant) +(0 + Part | Participant) + (1 | Item)			bir_kediyi ~ Part * Spec + (1 | Participant) +(0 + Part | Participant) + (1 | Item)			bir_kediyi ~ Part * Spec + (1 | Participant) +(0 + Part | Participant) + (1 | Item)		

bir kedi									
Intercept	0.93	0.20	4.703	0.76	0.20	3.829	0.92	0.19	4.714
Partitivity	3.08	0.28	10.846	2.96	0.22	13.212	3.04	0.25	12.059
Specificity	0.38	0.19	1.995	0.44	0.16	2.667	0.37	0.18	2.014
Part x Spec	0.50	0.38	1.338	0.34	0.33	1.045	0.50	0.37	1.350
Group							-0.15	0.21	-0.730
Group x Part							-0.08	0.33	-0.244
Group x Spec							0.07	0.25	0.270
Group x Part x Spec							-0.15	0.49	-0.310
Model	bir_kedi ~ Part * Spec + (1 | Participant) + (0 + Part | Participant) + (1 | Item)			bir_kedi ~ Part * Spec + (1 | Participant) + (0 + Part | Participant) + (1 | Item)			bir_kedi ~ Part * Spec + (1 | Participant) + (0 + Part | Participant) + (1 | Item)		
kediyi									
Intercept	-2.24	0.28	8.013	-2.32	0.26	-8.888	-2.23	0.28	-8.106
Partitivity	-1.58	0.22	-7.201	-1.47	0.21	-7.115	-1.58	0.22	-7.230
Specificity	-0.54	0.22	-2.516	-0.32	0.20	-1.591	-0.54	0.22	-2.515
Part x Spec	0.02	0.43	0.048	0.77	0.41	1.887	0.02	0.43	0.046
Group							-0.10	0.30	-0.324
Group x Part							0.10	0.30	0.350
Group x Spec							0.22	0.30	0.734
Group x Part x Spec							0.75	0.59	1.267
Model	kediyi ~ Part * Spec + (1 | Participant) + (1 | Item)			kediyi ~ Part * Spec + (1 | Participant) + (1 | Item)			kediyi ~ Part * Spec + (1 | Participant) + (1 | Item)		

Figure 5 shows the mean proportion of the different response types in the partitivity and specificity conditions produced by monolingual controls and heritage speakers. The fixed effects of the final models for the HSs and control participants, and the conjoined model are shown in Table 2. Below, we report the proportions of every response type across four semantic contexts (partitivity by specificity) for each group separately.

4.2.1. bir kediyi responses (Acc marked indefinites)

This is the type of response that is allowed in three of the contexts but not in nonpartitive-nonspecific context. The model for the monolingual controls revealed an effect of partivity resulting from significantly higher proportions of *bir kediyi* responses in the partitive than in the nonpartitive contexts. The model for the heritage speakers revealed an effect of both partitivity and specificity indicating significantly more *bir kediyi* responses in both partitive and specific contexts. There was also a significant interaction between partitivity and specificity. While the effect of partivity occurred regardles of the specificity, post-hoc comparisons showed that the effect of specificity only occured in the nonpartitive context (b = -1.55, SE = 0.51, z = -3,036, p = .00239) but not in the partitive context (b = 0.23, SE = 0.19, z = 1.227, p = .220). Note however, that overall the poroportion of bir kediyi responses

in the partitive contexts were quite low. Despite the differences in the separate models, the conjoined model did not reveal an effect of group or interactions between group and specificity.

4.2.2. bir kedi responses (unmarked indefinites)

This is basically the widest scope response because it can be used in every context under investigation in this study. All three models revealed an effect of partitivity and specificity. The effects are reflected by higher proportions of *bir kedi* responses in the nonpartitive contexts than in the partitive contexts and higher proportions of *bir kedi* responses in the specific than in nonspecific contexts. The conjoined model did not reveal differences between heritage speakers and controls.

4.2.3. kediyi responses (definites)

Since we had not originally aimed at delving into how partcipants distinguish between definite and indefinite forms we will not discuss *kediyi* responses in detail. Nevertheless, we would like to report their preferences regarding the definite form because this form is infeliticious in all of the contexts. The model for the monolingual controls revealed effects of partitivity and specificity, resulting from more *kediyi* responses in the partitive contexts than nonpartitive contexts and more responses in non-specific than specific contexts. The models for the heritage speakers revealed an effect of partitivity, reflecting more *kediyi* responses in the partitive than nonpartitive context, and a marginal interaction between partivity and specificity ($z = 1.887$, $p = .0591$). Post-hoc comparisons revealed an effect of specificity in the partitivite contexts ($b = -0.71$, $SE = 0.23$, $z = -3.151$, $p = .00163$), reflecting more *kediyi* responses in non-specific than specific contexts, but no effect of specificity in the nonpartitive context ($b = 0.06$, $SE = 0.35$, $z = 0.176$, $p = .861$). The conjoined model did not reveal differences between both groups.

4.3. Predicting performance based on background factors

To sum up so far, we have established that both groups in general, are more accurate in specific contexts and nonpartitive contexts than nonspecific and partitive contexts. Both groups tended to opt for *bir kedi* responses more often in nonpartitive and specific contexts. Both groups also preferred more *bir kediyi* responses in partitive than non-partitive contexts, while heritage speakers also produced slightly more *bir kediyi* responses in non-specific and non-partitive contexts than in specific and non-partitive contexts. Both groups also preferred the third option, *kediyi,* in partitive contexts; and/but monolinguals produced more *kediyi* responses in nonspecific compared to specific contexts. In general, however, the differences between the groups were small and did not reach significance in the conjoined models. HSs preferred more *bir kediyi* responses in both partitive and specific contexts while monolinguals had more *bir kediyi* responses only in partitive contexts. The third option, *kediyi* was preferred more often in partitive contexts by the HSs; and monolinguals had more *kediyi* responses in both partitive and nonspecific contexts. In general, however, none of the models yielded significant differences between the groups.

We carried out a third set of analyses in order to see whether any external factors account for the HSs' performance. We have entered all personal background variables into a principal component analysis in order to decrease the number of variables but age of onset of German and language proficiency were left out because we wanted to treat them as single-item factors in further analyses of the background factors.

4.3.1. Principal component analysis

The principal component analysis (PCA) was carried out using the psych package (psych 1.8.4, Revelle 2018). It had been possible to merge items on the use of L1 versus L2 by recoding their response according to what the participant preferred more so the data set was reduced to fewer variables to be thrown into the PCA. To illustrate, if a participant reported that she only spoke to her siblings in German and she never used Turkish with them, this was coded as 1 referring to exclusive use of German; if she reported that she only used Turkish and never used German with them, this was coded as 5; 3 meant that she used both languages equally frequently; 4 meant that she used Turkish more often; and 2 meant that she used German more often. This is how the questions on German and Turkish use with parents, siblings and friends, language use at school and work, and amount of reading and media exposure were recoded, too. Further reduction was possible through excluding some items because variability was too low, or there were too many missing values (e.g., all informants had Turkish speaking parents except two and not all informants had partners or children, so these variables were excluded). The PCA was conducted on the reduced the dataset of fifteen questions. All variables were standardized to the same scale prior to entry into the PCA, with the maximum value in the dataset (e.g., strong willingness to maintain Turkish) set to 5 and the minimum value set to 1 (use of German with parents).

In order to determine the suitability of our dataset for the principle component analysis, Kaiser-Meyer-Olkin (KMO)-criterium was calculated. Variables with values lower than 0.5 (which is the advised cut-off point) (Field et al., 2012) were excluded from the analysis and the final data set involved ten questions from the questionnaire (see Table 3).

Table 3. Factors loadings of the principal component analysis (loadings<0.3 suppressed)

Item	**Factor 1 (experience)**	**Factor 2 (attitude)**	**Factor 3 (social life)**
Turkish language lessons	0.80		
Language use at work (or school)	0.73		
Language use with parents	0.70		
Reading in Turkish vs German	0.58		
Media exposure in Turkish vs German		0.84	
Importance of maintaining Turkish		0.76	
Codeswitch		0.68	
Language use with siblings			0.83
English proficiency			0.56
Language use with friends			0.54
SS loadings	2.44	2.03	1.80
Variance explained	0.24	0.20	0.18
Cumulative variance	0.24	0.45	0.63

The PCA with Varimax (orthogonal) rotation identified a total of three components which were saved as factors contributing to 63 % of the total variance (see Table 4 for the full components matrix).

Table 4. MSA (Measure of sample adequacy) for the ten final questionnaire questions included in the PCA

Item	MSA
Turkish language lessons	0.74
Media exposure in Turkish vs German	0.65
Reading in Turkish vs German	0.81
Language use at work (or school)	0.67
Language use with parents	0.64
Language use with siblings	0.64
Language use with friends	0.61
Codeswitch	0.51
English proficiency	0.70
Importance of maintaining Turkish	0.71

4.3.1.1. Factor one

The first factor has large positive associations with language lessons; amount of language use with parents and at work(school); and reading. This factor explained 24% of the variance (Cronbach's alpha/α=0.67). Turkish lessons is the item that loads most strongly on this factor (0.80), so that factor one is primarily a measure of formal language training experience that took place during early school years. The participants scoring high on this item tend to prefer to use Turkish more with their parents perhaps because it is often the case that parents that are more adamant on the maintenance of Turkish encourage their kids to take language lessons and they aim an L1 in the family language policy, which brings about predominant Turkish use with parents (but this does not coincide with Turkish use with siblings and friends). These people also tend to use Turkish more at work and school contexts wherever and whenever possible (e.g., with clients, colleagues and fellow students who speak Turkish). Another shared feature of these participants is that they prefer to read in Turkish more (e.g., books, newspapers and online sources) perhaps because the interaction with parents and others help foster their general language ability and they have earlier mastered literacy skills via language lessons, they have developed an affinity to read in Turkish more often. We named this 'early experience factor'.

4.3.1.2. Factor two

This factor comprised three items relating to the answers about audio-visual media consumption, attitudes about the maintenance of Turkish, and codeswitching habits. It explained 20% of the variance (Cronbach's α =0.63). The item assessing audio-visual media stands out as most important because it has the highest loading on this factor (0.84). Higher preference for Turkish audiovisuals is associated with more positive attitudes towards Turkish and to maintain Turkish, so the people who like to watch Turkish movies, news, talk shows, casting shows and documentaries would also like to preserve their language skills because they think it is important to be able to speak and understand Turkish. These people also happen to be the ones that do not code-switch or does so the least, revealing that they can express themselves fully and fluently without resorting to German. It is possible that frequent exposure to Turkish media provides them with constant input and help them keep their language active and easily accessible. Another reason for avoiding codeswitching could be associated with a desire to keep their connection with the L1 culture and to keep the mother tongue alive by practicing it in its pure form so

that it will not attrite and be maintained over generations. Since this factor hints at sociocultural and linguistic orientation we named it 'linguistic/cultural attitude factor'.

4.3.1.3. Factor three

The last factor had high loadings of items related to the answers to the questions about language use with siblings and friends and the participants' level of proficiency in English. It explained 18% of the variance (Cronbach's α=0.55). Language use with siblings is the one with the highest loading (0.85), indicating that factor three is primarily a measure of language use with siblings. The participants who prefer to speak to their siblings and friends in Turkish rather than German also happen to have weaker foreign language skills. Anticipating that foreign language knowledge would affect people's socialization and entertainment choices by potentially taking away the time they would spent in Turkish or German, we had asked their foreign language skills. Since English was the language they were most proficient in, we only considered their English proficiency in the analyses. It is possible those that are competent in English would be interested in socializing with English speaking friends from time to time (e.g., university students with overseas friends), whereas those with limited English skills would tend to spend more time with their siblings and friends with whom they can communicate in Turkish. We named this as 'sibling and social life'.

4.3.2. Impact of background factors

In order to assess the impact of the background factors on the preferred responses, we added the factors to the models predicting the frequency of the three response types. The background factors were added in a step-wise fashion starting with the inclusion of one factor, first as main effect, then as interactions with partitivity, specificity and group. The predictor was retained in the model if model comparisons (using the Anova-function) indicated an improvement of the model. We tested the impact of the three background factors (revealed by the PCA) as well as the impact of the mean self-assessment in Turkish, the mean self-assessment in German, the mean ratings of the Turkish raters (on Turkish). The factors were centred. The statistics of the fixed effects of the final models of the fitting procedure are given in Table 5.

Table 5. Fixed effects of the models predicting the proportion of *bir kediyi*, *bir kedi* and *kediyi* responses and considering background factors (significant values at α = .05, are indicated in bold; RC2: Background factor 2, SRTr: Self-ratings for Turkish)

	bir kediyi			bir kedi		
	b	SE	Z	b	SE	Z
Intercept	1.98	0.23	8.572	0.76	0.19	4.037
Partitivity	3.27	0.36	9.170	2.95	0.22	13.282
Specificity	-0.67	0.25	-2.660	0.44	0.65	2.663
Part x Spec	-1.79	0.50	3.570	0.34	0.33	1.041
BF2	-0.58	0.31	-1.854	0.65	0.22	2.976
Spec:SRTr	-0.33	0.17	-1.861			
Model	bir_kediyi ~ Part + Spec + Part:Spec + BF2 + SRTr:Spec + (1 | Participant) + (0 + Part | Participant) + (1 | Item)			bir_kedi ~ Part + Spec + Part:Spec + BF2 + (1 | Participant) + (0 + Part| Participant) + (1 | Item)		

4.3.2.1. bir kediyi responses (Acc marked indefinites)

The final model identified by the model fitting procedure is presented in left column of Table 5. The model revealed significant effects of specificity, partitvity and the interaction between specificity and partitivity, similar to the previous models. The model also revealed a marginal main effect of the attitude factor (factor 2) (b = 0.58, SE = 0.31, z = -1.854, p = .06375), reflecting overall less *bir kediyi* responses of participants with higher ratings on the factor regardless of the semantic context, as well as a marginal (negative) interaction between specificity and the self-ratings in Turkish (b=-0.33, SE = 0.17, z = -1.861, p = .062756), reflecting a weaker effect of specificity with higher self-ratings for Turkish. The impact of the other factors and their interactions did not approach significance. The interaction with the Turkish self-ratings fits into the pattern of the controls who did not show an effect of specificity. Thus, the lack (or reduction) of the specificity for higher proficient heritage speakers would fit well.

4.3.2.2. bir kedi responses (unmarked indefinites)

The final model identified by the model fitting procedure is presented in right column of Table 5. Similar to the previous model (Table 2), there were significant effects of specificity and partitvity but no interaction between specificity and partitivity. In addition, the model revealed a main effect of the attitude factor (factor 2), reflecting more *bir kedi* responses with higher scores on the attitude factor. This effect of the attitude factor is the reversed pattern for the *bir kediyi* responses and may indicate that heritage speakers who score high on linguistic attitude may use more *bir kedi* responses compared to *bir kediyi* response.

4.3.2.3. kediyi responses (definites)

The model procedure for the *kediyi* responses did not reveal an impact of the background or proficency factors considered in the new model fitting procedure.

5. Discussion and conclusion

With the present study into heritage grammar, we have attempted to demonstrate the potentials of HSs who have often been characterized by various shortcomings in their language abilities as compared to the monolingual yardstick. Unlike most previous studies, we focused on a group of HSs who are known to be highly proficient in their HL. We then focused on a linguistic area that is challenging and particularly hard to be acquired in a bilingual situation, referential forms in indefinite contexts (i.e., *bir kedi* versus *bir kediyi*). We had predicted that HSs would have problems differentiating different semantic contexts because of the absence of a morphological marker in German equivalent to Turkish Acc case and also because of the complexity associated with this linguistic feature. Since *bir kedi* is the widest scope option that can be used in all of the contexts and also in German, we had expected that HSs would mainly prefer this option; and they would use *bir kediyi* incorrectly in nonpartitive and nonspecific contexts. Contrary to our predictions, the performance of HSs was very similar to that of monolinguals.

In our analyses, one of the most striking observations was the nontargetlike responses observed in the monolingual reference group. As shown in Figure 4, their accuracy in the partitive contexts gets as low as 72% in nonspecific and 80% in specific contexts. They incorrectly use the definite form *kediyi*, indicating that they may be associating partitivity with definiteness. In nonpartitive/nonspecific contexts, they manage to use the target form *bir kedi* only 87% of the time but in nonpartitive/specific

contexts they are quite accurate (92 %). Somewhat variable performance may be due to the fact that coordination of syntax and discourse pragmatics is complicated even for native speakers. It is also possible that the distinctions are hard to make in the absence of other cues (e.g., gestures, immediate contextual cues, joint attention, and shared knowledge and assumptions) which are present in real encounters and facilitate communication. Alternatively, this could simply be an indication of the inherent variability of the language within itself (i.e., similar to the choice between overt versus null subject/pronoun and different word orders in Turkish) (Poplack & Levey, 2010; Labov, 1994). What matters most is that, despite some variation/errors, their choices seem to be constrained by both specificity and partitivity to a large extent; therefore, nontargetlike choices do not point to a lack of understanding of information flow in discourse or nonnativeness.

Both groups of speakers generally display higher accuracy in nonpartitive contexts (*bir kedi*) indicating their awareness that a nonpartitive context requires a novel reference, a reference that is not contextually linked to a set mentioned in the previous discourse. With regards to the specificity factor, it appears that the speakers find specific contexts *bir kedi* and *bir kediyi*) somewhat easier than nonspecific ones (*bir kedi*) as they have more correct responses in these contexts. The dialogues in specific contexts start with the introduction of a target referent and at the end, there is the second mention of the referent where the speaker explicitly declares his/her familiarity with it. Perhaps such a flow is more natural/expected compared to nonspecific contexts where the speaker declares the opposite and the hearer is left with an uncertainty about the identity of the referent. These possibilities notwithstanding, additional investigations are required to be able make solid assumptions about these tendencies.

Further analyses comparing the choices across four semantic contexts reveal that HSs are able to successfully encode/decode relationships and construct pragmatically appropriate utterances. While they are not always like mirror images of the reference group, none of the differences turned out significant. Both groups preferred to choose *bir kediyi* more often in the partitive contexts indicating that they correctly associate the Acc case with an entity whose superset has been previously introduced. The HSs also used this form in the specific/nonpartitive context revealing that they correctly associate it with specificity. The usage of this form by the HSs is interesting in itself because they could simply opt for the *bir kedi* option which is correct in all four contexts. Both groups had the knowledge that *bir kedi* is a first mention referent and new to the discourse and hence expected in the nonpartitive and specific contexts. They are also aware of the fact that it can be alternately used with *bir kediyi* in partitive and specific contexts as the allocation of responses illustrate. At the same time, the fact that they do not overgeneralize the *bir kediyi* forms in *bir kedi* contexts (i.e., nonpartitive/nonspecific) indicate their sensitivity semantic and pragmatic cues in indefinite contexts despite contrasting properties in the L1 and L2.

Our findings are not in line with several previous studies on heritage Turkish that reported divergences in the form of omission and/or replacement of an L1 form in the domains of collocations (Doğruöz & Backus 2009), word order in basic sentences as well as in relative clauses and subordination (Doğruöz & Backus, 2009; Onar-Valk, 2015); Schaufeli 1996; Treffers-Daller et al. 2007; Yağmur 1997), case morphemes (Doğruöz & Backus 2009) compound noun formation (Türker 2005), binding properties of pronouns (Gürel & Yılmaz), evidentiality (Arslan et al., 2017; Karayayla, 2018). Given widespread vulnerability in contact situations reported in the literature so far, it is hard to answer why and how these discourse based factors have remained so resilient. The linguistic structure under investigation looks like an ideal candidate to change in contact situation (an interface-conditioned property, presence

of a competing L2 form; high proficiency in the L2, intensive L2 use and exposure to L2); however, it seems that change is not inevitable and at least for certain structures such as this one where change would lead to frequent miscommunication.

Other linguistic background factors behind their success are hard to unveil. The predictors we included in our analyses seem to play no role at all, except linguistic attitude and level of self-rated proficiency which appeared to impact but only marginally. The speakers who are keen to maintain their Turkish seem to avoid *bir kediyi* forms and prefer *bir kedi* forms. Additionally, the speakers who rated themselves as more proficient in Turkish tended to avoid *bir kediyi* forms, too; yet neither at a significant rate. These speakers probably know that *bir kedi* is the default form and they prefer to play safe by avoiding *bir kediyi* responses. Lack of predictive value of the external factors is discouraging but we think their overall high proficiency may be undermining the relevance of all other factors. We do not know what this threshold is though. Comparing these results with those from lower proficiency speakers, such as the third generation immigrants and in particular those who are not literate in Turkish would be useful to understand the role of the external factors.

At the end, we are left with a puzzle the bilingual mind presents: Turkish HSs are able to acquire and maintain such a subtle linguistic feature while in fact they stand out among monolingual native speakers with respect to several other properties in their language such as lexicon and phonology. Apparently, the informative and communicative function (Grice, 1975) in this particular domain is more crucial than previously investigated properties. Since the risk of communication failure is so frequent (once per second, Krause & Braida, 2002), the speakers are willing to agree on shared mappings and forms and would like to rely on that these will be kept as they are. The present study cannot unfortunately demystify how they are capable of this; however, it certainly provides evidence for the bilingual's ability to synthesize information from several and sometimes conflicting sources and manage conflicting evidence from the other. The outstanding performance of HSs point to the presence of an intelligent algorithm that can easily recognize patterns and make correct decisions, which might have been evolved as a result of the human need for communication (Scott-Philips, 2010).

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Supplementary Material

		Heritage Speakers	Monolinguals
		n=35	n=30
Age of L2 onset	upto age 1	6	
	upto age 2	5	
	upto age 3	10	
	upto age 4	5	
	upto age 5	8	
Turksih language lessons received	upto a year	11	
	1 -2 years	7	
	2-3 years	5	
	3-4 years	7	
	more than 4 years	5	
English language proficiency	basic	7	18
	pre-intermediate	6	10
	intermeadiate	10	2
	upper-intermediate	3	
	advanced	9	
Code-switching habits	never	5	
	rarely	13	
	sometimes	13	
	frequently	3	
	all the time	1	
Importance of maintaining L1	not at all		
	a bit		
	somewhat	9	
	important	18	
	very important	8	

More L1 or L2 speaking friends	only Gr		
	more Gr	3	
	equal	15	
	more Tr	17	
	only Tr		
Confident speaking L1 or L2	only Gr	7	
	more Gr	11	
	equal	17	
	more Tr		
	only Tr		
Frequency of use of language use - more specific questions:		L1	L2
How frequently do you use your L1 and L2 overall?	rarely		
	a few times a year		
	monthly		
	weekly	1	
	daily	34	35
		L1	L2
How frequently do you use your L1 at work/school?	never		
20 working at the moment, 10 university students, 1 unemployed , 1 waiting to enter univ., 3 work and study at the same time	seldom	16	
	sometimes	13	1
	often	4	9
	very often	2	25
How frequently do you have contact with friends and family in your home country?	never		
	seldom		

	sometimes	15	
	often	10	
	very often	10	
How frequently do you visit your home country?	never		
	seldom		
	sometimes	8	
	often	21	
	very often	6	
How frequently do you use your L1 and L2 with your partner?	average (1 = never, 5 = all the time)	L1	L2
12 with partner or married	never		
	seldom		
	sometimes	1	
	often	5	
	very often	6	
How frequently do you use your L1 and L2 with your siblings?		L1	L2
3 of them are only child	never		
	seldom	6	2
	sometimes	13	4
	often	10	25
	very often	2	4
How frequently do you use your L1 and L2 with your children?		L1	L2
8 people have kids	never		
	seldom		3
	sometimes		5
	often	8	
	very often		
How frequently do you use your L1 and L2 with your friends and acquaintances?		L1	L2

	never	2	
	seldom	6	
	sometimes	14	6
	often	13	21
	very often		8
How frequently do you read books/newspapers,articles on the internet in your L1 and L2?		L1	L2
	never		
	seldom	17	8
	sometimes	12	7
	often	6	20
	very often		
How frequently do you listen to the radio/music/watch TV in your L1 and L2?		L1	L2
	never		4
	seldom	7	7
	sometimes	23	14
	often	5	4
	very often		6
Attitudinal factors			
How important is it to you to maintain a good level of proficiency in your L1?	not important at all		
	not important		
	neutral		
	important	20	
	very important	15	
Which language do you feel more comfortable to speak with?	only L2		
	more L2		
	equal	17	
	more L1	11	
	only L1	7	

Do you have more L1 or L2 speaking friends?	only L2	
	more L2	3
	equal	15
	more L1	17
	only L1	