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Focus in heritage Hungarian*

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Abstract

Bilinguals have been shown to differ from monolinguals especially in the realization and interpretation of phenomena that operate at the syntax/discourse interface. Hungarian has a well-known interface structure—identificational focus—which has been widely studied in the theoretical literature but never with bilinguals. The present paper fills that gap, using three acceptability judgment experiments to test the realization and interpretation of identificational focus by heritage speakers and L1-dominant native speakers of Hungarian. The results reveal that both groups pattern similarly, showing some vulnerability at the syntax/discourse interface with regard to focus interpretation, but less so with its realization. Further, the findings bear on the description of Hungarian focus in the theoretical literature, providing experimental evidence that focus is realized preverbally and that its interpretation is the result of a pragmatic implicature rather than part of the sentence's semantics.

Keywords: identificational focus, cross-linguistic influence, transfer, Interface Hypothesis, heritage speakers, syntax/discourse interface

1 Introduction

Heritage language acquisition shares characteristics with both first language (L1) and second language (L2) acquisition, while at the same time adult heritage speakers' grammatical competence differs from that of monolingually raised L1 speakers and from that of L2 learners of the heritage language. For example, like other L1 speakers, heritage speakers are native speakers of their heritage language, which they acquire naturalistically in childhood; on the other hand, like L2 learners, heritage speakers typically receive input which may be quantitatively reduced and qualitatively different than under monolingual L1 acquisition conditions. With regard to outcomes, heritage speakers often resemble other L1 learners in some ways and L2 learners in some ways. Importantly, unlike L1 acquisition in a majority language environment, heritage language acquisition, where the heritage language is usually a minority language, results in heterogeneous outcomes across individuals, as with L2 acquisition. Because heritage speakers share characteristics with both L1 and L2 speakers while also differing from both, this population can serve as an important group with which to test hypotheses about language acquisition (Montrul 2008b; Montrul & Polinsky 2011).

When heritage speakers' grammars diverge from those of other native speakers, they often do so in the same areas in which L2 speakers' competence diverges. One domain that has been shown to be problematic for L2 learners and heritage speakers alike is the syntax/discourse interface. In fact, linguistic structures that are regulated by the discourse context or by pragmatics have been found to pose special difficulty for bilinguals of all types, including in cases of L2 acquisition (Belletti, Bennati & Sorace 2007; Rothman 2009a; Sorace 2011; Sorace & Serratrice 2009; Tsimpli & Sorace 2006), L1 attrition (Tsimpli 2007; Tsimpli et al. 2004), bilingual L1 acquisition (Müller & Hulk 2001; Paradis & Navarro 2003; Serratrice 2007;

Serratrice, Sorace & Paoli 2004; Sorace et al. 2009), and heritage language acquisition (Albirini, Benmamoun & Saadah 2011; Benmamoun, Montrul & Polinsky 2010, 2013a; Fenyvesi 2005; Laleko & Polinsky 2016; Montrul 2004, 2011; Montrul & Polinsky 2011; Rothman 2009b; Silva-Corvalán 1994; Zapata, Sánchez & Toribio 2005), whereas other components of the grammar, such as core syntax, phonology, or the syntax/semantics interface are more resilient.

Several hypotheses have been put forward to explain why the syntax/discourse interface should be more vulnerable than other domains of grammatical knowledge (discussed in section 2). The present paper contributes to this debate by examining an interface structure—Hungarian identificational focus—which has been widely studied in the theoretical literature but which has received relatively little attention by researchers in the fields of bilingualism or acquisition (although see Kas & Lukács 2013 and references therein for some discussion of L1 acquisition). The characteristics of this construction are explained in section 3. The present work examines knowledge of the realization and interpretation of Hungarian focus in the grammars of heritage speakers of Hungarian, who acquired both English and Hungarian in childhood and who are English dominant, and L1-dominant native speakers of Hungarian who were raised in Hungary or Romania and learned English as adults. By comparing two groups with different histories of acquisition, these results have implications for understanding how different grammatical domains are acquired. The research questions are laid out in section 4 and an overview of the methods in section 5. Sections 6-8 present the three experiments and their results, which indicate, in summary, that the syntax/discourse interface is somewhat vulnerable in bilinguals (at least when it comes to interpreting focus) when compared to narrow syntax, but no differences were found between the heritage speakers and the native speakers. Section 9 discusses the implications of these results.

2   Heritage language acquisition and the syntax/discourse interface

Heritage speakers are "asymmetrical bilinguals who learned language X – the 'heritage language' – as an L1 in childhood, but who, as adults, are dominant in a different language" (Benmamoun, Montrul & Polinsky 2013b:260). These speakers are generally simultaneous or early sequential bilinguals who learn two languages in childhood, but whose L1 is not their dominant language in adulthood. Typically, the heritage language is a minority language, and the eventual dominant language is the societal majority language. The grammars of heritage speakers may be affected by a variety of factors, unlike other bilinguals, which can result in outcomes that are different than those of monolingually raised speakers of the heritage language, including incomplete acquisition, attrition, acquisition of a contact variety, differential activation of linguistic features over time, lack of exposure to particular registers, and differences in formal education (Benmamoun, Montrul & Polinsky 2013a; Montrul 2008a; Pires & Rothman 2009; Polinsky 2011; Putnam & Sánchez 2013; Rothman 2007, 2009b).

Nevertheless, when these speakers' grammars diverge from those of monolinguals, they pattern with other bilinguals in showing persistent difficulty especially with the syntax/discourse interface (Albirini, Benmamoun & Saadah 2011; Benmamoun, Montrul & Polinsky 2010, 2013a; Fenyvesi 2005; Montrul 2004, 2011; Montrul & Polinsky 2011; Rothman 2009b; Silva-Corvalán 1994; Zapata, Sánchez & Toribio 2005), although not for all discourse phenomena (Leal Méndez, Rothman & Slabakova 2015). It is therefore important to ask: Why should this particular aspect of grammatical knowledge be more vulnerable than others? That is, what is special about the acquisition of the syntax/discourse interface? Several explanations have been put forward, which could be grouped into two broad categories.

First, some approaches claim that the syntax/discourse interface in bilinguals is the site of cross-linguistic influence or transfer, which could be called the *Transfer Hypothesis* (hereafter, TH). Hulk and Müller (2000) offer perhaps the best-known articulation of this approach, arguing that there are two prerequisites for cross-linguistic influence in bilingual children: (i) that the structure in question belongs to the syntax/pragmatics interface (which they define as involving the C-domain) and (ii) that "there is a certain overlap of the two systems at the surface level" (Hulk & Müller 2000:229). Transfer occurs due to exposure to the overlapping structures before children have fully acquired the properties of the C-domain. Similarly, Prince (1988, 1998), Silva-Corvalán (1993, 1994, 2008), and Muntendam (2009, 2013) argue that what appears to be syntactic transfer between languages is actually transfer of pragmatic features, such that speakers extend the uses of an existing structure to new discourse contexts, but will not directly transfer syntactic features. Under this view, if Language A uses two syntactic structures, S1 and S2, in different discourse contexts and Language B has only one of those structures, equivalent to S1, used in both discourse contexts, bilingual speakers may extend the use of S1 in Language A into the domain of S2 based on the transfer of pragmatic features from Language B. A transfer of pragmatic usage, but not of syntax, occurs, appearing only where there is structural overlap between the languages. Kupisch (2012) argues further that language dominance and frequency of exposure or quantity of input play a decisive role in this sort of cross-linguistic influence; in her study of German/Italian bilinguals, each speaker's dominant language was like monolingual targets but their non-dominant language showed evidence of cross-linguistic influence.

Another approach is the *Interface Hypothesis* (hereafter, IH), which proposes that discourse phenomena are particularly difficult to acquire for bilinguals because of their increased processing load (for an overview, see Sorace 2011). The hypothesis rests on a distinction

between internal interfaces—those between linguistic subsystems, such as syntax/phonology or syntax/semantics—and external interfaces—those between the linguistic system and other cognitive modules, such as syntax/discourse. The IH claims that external interfaces involve incorporating information from multiple domains and are thus harder to process. It is because of this processing difficulty that residual optionality or variability is observed for external interface phenomena. Although the IH has been very successful in explaining some phenomena (e.g., anaphora resolution), the internal/external distinction has been criticized on both conceptual and empirical grounds (Duffield 2011; Hoot 2017; Montrul 2011; Pérez-Leroux 2011; White 2011). Instead of a sharp distinction between the two types of interfaces, Hopp (2009, 2011) and O'Grady (2011) propose an explanation in terms of a gradient of complexity, with more complex constructions proportionally more difficult to process and thus more unstable in bilingual performance. A revision of this sort to the IH, which Sorace (2012) supports, may be promising, although a precise definition of what makes something complex remains to be worked out (see Laleko & Polinsky 2016 for one proposal), in particular for phenomena that do not behave entirely as expected for either type of interface, like focus (Hoot 2017). Such a reformulation retains the central insight, though, that bilingual difficulties with certain constructions are due to processing restrictions, which produce variable outcomes.

Both hypotheses agree that the syntax itself is not problematic for bilinguals but differ on the expected behavior of bilinguals regarding discourse phenomena. The TH predicts transfer from one language to another, as long as there is structural overlap, modulated by dominance and by which language is more restrictive. On the other hand, the IH does not predict transfer for discourse/pragmatic features, but rather optionality or indeterminacy. In fact, the IH predicts that transfer from one language to another will only happen for internal interfaces, like

syntax/semantics (Sorace & Serratrice 2009). Instead, bilinguals' difficulty with external interfaces is that the processing load makes it hard to consistently access native-like interpretations or realizations of discourse phenomena, resulting in variable judgments and/or production.

To the extent that these two hypotheses describe general features of bilingual grammars, we expect them to be active in heritage language acquisition as for other bilinguals, although potentially modulated by the specific circumstances under which heritage languages are acquired. In particular, heritage speakers may receive input that has already been affected by these or other processes, because the previous generation, which often provides the input in the heritage language, may also be bilingual and their use of the minority language may be affected by attrition. Sorace (2011) excludes heritage speakers from the IH for precisely this reason. However, as Leal, Rothman and Slabakova (2014) point out, Sorace recognizes that the IH can be applied to heritage speakers "as long as the differences between individual and intergenerational attrition are clear" (Sorace 2012:214). For this reason, Leal et al. compare heritage speakers of Spanish not to Spanish monolinguals, but to monolingually raised L1 Spanish speakers who learned L2 English as adults, i.e. speakers with the profile of the input providers for the heritage speakers. Comparing heritage speakers, who are both native speakers of Spanish and Spanish/English bilinguals, to another group which shares those characteristics but differs in their acquisition history may allow researchers to determine what role, if any, qualitatively different input from the previous generation played in the outcome of heritage language acquisition, and to isolate this from general properties of interface instability. The present work adopts precisely this strategy: as discussed more thoroughly in section 5.1, I compare heritage speakers to L1-dominant native speakers of Hungarian raised in Hungary or

Romania who now reside in the United States and who learned English as adults. This allows for a clearer picture of the factors affecting heritage grammars—including what may be present in the input and what is the result of transfer or processing difficulty—with regard to the syntax/discourse interface. The present study addresses this question by investigating one particular interface phenomenon: focus in Hungarian.

3   Focus in Hungarian

The Hungarian focus construction has been the subject of extensive research in the linguistics literature (for an overview, see É. Kiss 1998, 2002; Kenesei, Vago & Fenyvesi 1998). Comparing the neutral sentence in (1) to the sentence with focus in (2), adapted from É. Kiss (1998), reveals four important properties of this structure.[1]

(1)   Context: What's up?
      Mari fel   hívta   Pétert.
      Mary VM called   Peter.ACC
      'Mary called Peter up.'

(2)   Context: Who did Mary call up?
      Mari [PÉTERT]F hívta   fel.
      Mary Peter.ACC called   VM
      'It was Peter (and no one else) that Mary called up.'

First, it is sensitive to the surrounding discourse context, such that the sentences in (1) and (2) are appropriate in different contexts. Second, the focal constituent focus bears emphatic

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[1] Here, and throughout, focus is marked by brackets and the subscript 'F,' and stress is indicated by small caps. Following Brody (1990) and Szendrői (2001), particles that form part of the verbal complex are glossed as VM, for verbal modifier, and are separated from the verb for clarity, although standard Hungarian orthography writes them as one word when the VM comes before the verb, as in the neutral case.

stress. Third, it undergoes movement to an immediately preverbal position, triggering inversion of the verb and its verbal modifier (VM). Fourth, focus has an exhaustive reading, such that (2) has the inference that it was only Peter that Mary called. Let's look at each of these properties in turn.

3.1   Focus is constrained by discourse context

Like information-structural categories in other languages, the distribution of focus is sensitive to pragmatic/discourse factors, although there is not always a direct correspondence between particular discourse contexts and focus realization. For instance, Kenesei, Vago, and Fenyvesi (1998) claim that answers to *wh*-questions require the corresponding constituent to be in the preverbal focus position, and Onea and Beaver (2011:343) claim that "preverbal focus is grammatically constrained to be a question-answering constituent." Horvath (2007) similarly notes that *wh*-questions normally require focus movement in their answers but also contends that it is possible in certain cases to answer a *wh*-question with the relevant constituent in situ, despite its being in focus based on the context. Kenesei (2006) and Roberts (1998) concur that it is possible to answer a question with in situ focus. For example, (3) shows that at least some *wh*-questions can be answered without focus movement.

(3)   Honnan tudhatom meg a menetrendet?   (adapted from É. Kiss 2010, ex. 14)
       'Where can I learn the railway time table?'
       Meg tudhatod   az INTERNETRŐL.
       VM   learn-can-you the Internet-from
       'You can learn it from the internet (among other places).'

Based on data like (3), É. Kiss (1998) distinguishes between two types of focus in Hungarian: identificational focus and information focus. Identificational focus, as in (2), undergoes movement and carries an exhaustive identification reading, while information focus,

as in (3), is in situ and has no exhaustive reading. This distinction leads some (e.g., Horvath 2007) to argue that focus and exhaustiveness are two separate properties, with the latter triggering movement. Nonetheless, both types of focus are sensitive to the surrounding discourse context, with *wh*-questions biased toward preverbal identificational focus.

This paper is concerned primarily with the realization and interpretation of identificational focus (2), with its movement and exhaustive interpretation, which is the construction that has received the most interest from researchers. Information focus (whose properties, furthermore, find little consensus in the literature)[2] will not be considered further, and when I refer simply to 'focus' to avoid repetition, it should be taken to mean identificational or exhaustive focus.

3.2 Focus receives emphatic stress

As is the case cross-linguistically, it is widely agreed that stress plays in important role in marking foci in Hungarian. Both intensity and fundamental frequency play a role in realizing stress in Hungarian, with pitch accent being the main indicator of stress at the intonation phrase (iP) level (Hunyadi 2002; Varga 2002). In a neutral sentence, as in (4), each prosodic word receives a pitch accent consisting of an H+L sequence, which is always on the first syllable. If there is a Topic constituent, it forms its own iP, with the rest of the sentence—what É. Kiss (2002) calls the "predicate," headed by the verb—forming an iP as well (though see Genzel,

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[2] Roberts (1998:133) notes that "there is some dissension … about the range of acceptability of postverbal Information Focus," reporting differing judgments on whether and/or in what contexts postverbal information focus is possible, both from prominent linguists and her own informants. See É. Kiss (1998, 2008), Roberts (1998), and Horvath (2007), among others, for conflicting claims.

Ishihara & Surányi 2015 for a different view). Each iP has main stress at its left edge, with the

overall strongest stress falling at the left edge of the predicate, generally on the verb or its VM

(É. Kiss 2002, 2010). [3] Varga (2002) dismisses the perception of leftmost main stress as merely a

phonetic phenomenon: since each successive pitch accent is downstepped from the previous one,

the highest pitch will be at the beginning of the iP. Others (Vogel & Kenesei 1987, 1990),

however, maintain that leftmost stress in the Hungarian iP is a phonological rule.

(4)   Neutral sentence: (Topic)$_{iP}$ (Predicate)$_{iP}$[4]
      (János)$_{iP}$ (FEL   hívta   Pétert   tegnap)$_{iP}$
       John   VM called Péter-ACC yesterday
      'John called up Peter yesterday.'

(5)   Focus sentence: (Topic)$_{iP}$ (FOCUS Predicate)$_{iP}$
      (János)$_{iP}$ (PÉTERT   hívta   fel tegnap)$_{iP}$
      John   Péter-ACC called VM yesterday
       'It was Peter that John called up yesterday.'

When the sentence contains a preverbal identificational focus like (5), though, the stress

pattern is different. Main stress is still leftmost in the predicate, which now means that it falls on

the focus, which has moved leftward. But the focus is given additional prominence beyond the

usual main stress in two ways: (i) the focus receives a marked H*+L pitch accent, with a high

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[3] If the sentence also has a universal quantifier like *mindenki* 'everyone' or certain other expressions (like *is* 'also'),

these appear at the left edge of the predicate, before either the verb or the focus, where they are stressed with a

prosodic pattern very similar to the one used for focus (É. Kiss 2002; Hunyadi 2002). When quantifiers are not

present, though, as is the case for all the sentences I consider here, the stress falls on the verb or VM in neutral

sentences and the focal constituent in focus sentences.

[4] As before, main stress is indicated with small caps. Secondary stress on each prosodic word is indicated by

underlining the stressed syllable.

tone on the stressed syllable followed by a drop that covers a larger range and takes place more quickly than other pitch accents (generally within a syllable or two), and (ii) it reduces the stress of the following constituents (Genzel, Ishihara & Surányi 2015; Kenesei, Vago & Fenyvesi 1998; Kenesei & Vogel 1989; Rosenthall 1992; Vogel & Kenesei 1990). This second property, called in the Hungarian literature 'eradicating' stress (Kálmán et al. 1986; Kálmán & Nádasdy 1994), is generally claimed to be an essential component of focal stress and consists of the deaccentuation of postfocal constituents, possibly including the deletion of phonological phrase boundaries in the postfocal domain (Vogel & Kenesei 1987, 1990), such that they lose (or greatly reduce) their pitch accent and are realized with an f0 near the baseline.[5]

3.3 Focus requires syntactic movement

Preverbal focus is the result of syntactic movement. Evidence for this movement is found in the fact that, if the verb has a VM, the verb and its VM obligatorily undergo inversion, exactly as they do in other cases of syntactic movement to the left periphery, like *wh*-movement. Many Hungarian verbs have these VMs (also called preverbs or verbal particles), and their unmarked position is immediately preverbal. While not all verbs have VMs, if one is present and the sentence contains a constituent in focus, the VM instead appears postverbally.[6]

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[5]Post-focal constituents retain the increased intensity associated with word-level stress and are thus not de-stressed totally (Roberts 1998). Further, although they confirm the general picture of Hungarian focal stress (H*+L accent with a high tonal peak and steep drop on the focus) and the presence of deaccenting associated with focus, Genzel et al. (2015) found that deaccenting was not obligatory.

[6] VMs serve a number of functions, including marking telicity or perfectivity, and so may interact with the interpretation of focus (Onea & Beaver 2011), which may mean verbs with and without VMs behave differently.

Focus movement is generally analyzed as movement to a dedicated structural position in a Focus Phrase (FocP), which, along with a Topic Phrase (TopP), forms part of the Hungarian left periphery (Brody 1990; É. Kiss 1998, 2002, 2007).[7] These structural positions associated with particular information functions play an important role in the word order of Hungarian sentences, but there is some debate about the motivation for this movement (see Horvath 2005, 2007, Szendrői 2001, 2003). Regardless of which analysis one adopts, the important fact is that it is widely agreed that Hungarian preverbal focus involves syntactic movement. Focus in Hungarian is thus not merely an issue of pragmatic meaning but rather involves the interface of syntax and pragmatics.

3.4 Focus is interpreted exhaustively

One of the defining properties of identificational focus, as we have seen, is its implication of exhaustiveness. Szabolcsi (1981) claims that exhaustive focus affects the truth conditions of the sentence, such that the exhaustiveness is part of the sentence's semantics. Along similar lines, Horvath (2007) implements the exhaustive interpretation by means of a quantificational operator that, like other semantic operators, is part of the syntactic derivation and thus feeds the semantic interpretation of the sentence.

However, they are widely regarded as providing a clear diagnostic of movement to the left periphery, and all the verbs in the present study include them.

[7] In addition to these projections in the left periphery, there is a dedicated structural position hosting distributive quantifiers and other expressions, including universal quantifiers like *mindenki* 'everyone' and expressions with *is* 'also,' which is above FocP. Movement of quantifiers to this position is different from focus movement, though, and it does not trigger VM inversion. For a full discussion, see É. Kiss (2002), chapter 5.

However, É. Kiss (2009) shows that the preverbal focus construction is compatible with the presence of the expression *többek között* 'among others,' which cancels the exhaustive reading, as in (6).[8]

(6) Többek között JÁNOST   hívtam   meg. / JÁNOST   hívtam   meg többek között.
     Among others John-ACC invited-1SG VM / John-ACC invited-1SG VM   among others
     'It was John, among others, that I invited.'

Being cancelable is one of the defining properties of conversational implicatures, so the fact that the exhaustive reading can be canceled may indicate that it is more properly classified as belonging to pragmatics than semantics, as argued by Horn (2014) and Wedgwood (2005). Onea and Beaver (2011) used a clever experiment to test this idea. Their study is worth discussing in some detail for two reasons: (i) since the purpose of the present work is to test theories of bilingual language acquisition at the syntax/discourse interface, it is important to establish that the phenomenon in question belongs to that interface, and (ii) since their experiment informs the design of my experiment, the details are relevant to the present study's methods.

Native speakers of Hungarian were shown a picture in which two people had done the same thing (e.g., both Marci and Peter caught a butterfly). They were then given a context sentence that mentioned only one of the two participants (e.g., 'Marci caught a butterfly'), which had three possible forms: the explicit semantic quantifier *only* which necessarily makes the

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[8] As an anonymous reviewer points out, this datum in favor of exhaustivity being an implicature is not necessarily conclusive. For instance, it could be only that the domain of exhaustive interpretation does not contain all the relevant individuals (for example, if many people were invited but the current issue is distinguishing between John and Bill only). Nonetheless, it does show that focus is different from something like *only*, and this is not the only case of exhaustivity cancelation (see Horn 2014 for more discussion).

sentence semantically exhaustive, a 'neutral' sentence that carries no interpretation of exhaustiveness, and a sentence with preverbal focus on the subject. They were then asked to choose one of three possible responses, which were the Hungarian equivalents of (7)-(9).

(7)   No, Peter caught a butterfly too.
(8)   Yes, and Peter caught a butterfly too.
(9)   Yes, but Peter caught a butterfly too.

Onea and Beaver reasoned that the response participants chose could indicate whether they had interpreted the context sentence as exhaustive. If the exhaustiveness expressed by the context is semantic, participants should be more likely to respond with *No*, as in (7), which would be an appropriate answer for a sentence with explicit *only*. If the context expresses no implication of exhaustiveness, the picture does not provoke contradiction, so participants should be more likely to answer with *Yes and*, as in (8). If, however, the exhaustiveness of the context sentence is only pragmatically inappropriate—rather than semantically false—given the contradictory picture, participants would be expect to choose a third option, *Yes but*, as in (9), in which they do not contradict the truth-conditional semantics of the sentence but nonetheless cancel the pragmatic implicature.

Participants overwhelmingly chose the *No* answer (7) for sentences with explicit *only*, preferred *Yes and* (8) for 'neutral' sentences, and preferred *Yes but* (9) for sentences with focus movement. Thus, focus is not interpreted in the same way as *only*, but neither is it the same as a non-focus sentence. Onea and Beaver conclude that the exhaustiveness property of Hungarian focus is a pragmatic implicature, rather than a part of the sentence's truth-conditional semantics.

This conclusion has since found additional support in other experimental work. Kas and Lukács (2013), using a picture verification task, found that Hungarian speakers' interpretation of

focus did not pattern as expected for a semantic operator, and Gerőcs, Barbarczy, and Surányi (2014) used two experimental tasks to make the case for Hungarian focus being an implicature. In a later study, Destruel et al. (2015) reinterpret Onea and Beaver's results as showing not the *source* of the exhaustiveness inference (semantic vs. pragmatic) but rather the *status* of the inference with regard to the Question Under Discussion (at-issue vs. non-at-issue). They argue that Onea and Beaver's *Yes but* test more properly indicates that the exhaustiveness inference is not at-issue, which is what makes it different from asserting exhaustiveness, as with overt *only*. In the case of Hungarian focus examined here, though, these two constructs overlap, so the test should still be valid for discerning semantic from pragmatic exhaustiveness in the present experiment. Furthermore, experimental evidence is mounting in favor of a pragmatic explanation of Hungarian focus interpretation, which, along with the fact that focus realization is constrained by the surrounding discourse context, makes it clear that focus is a property of the syntax/pragmatics interface (rather than syntax/semantics). It is thus especially appropriate to test with bilinguals, for the reasons discussed in section 1.

In summary, focus in Hungarian involves four factors: discourse appropriateness, emphatic stress, syntactic movement, and pragmatic implicature. It clearly involves multiple linguistic interfaces, including those—like the syntax/pragmatics interface—which have been identified as posing special difficulty for bilinguals, including heritage speakers. Against this background, the present study tests the realization and interpretation of focus by bilinguals in the United States.

4   The present study: Focus in heritage Hungarian

According to the most recent data available as of this writing (from the 2010 and 2011 American Community Survey), there are about 94,000 Hungarian speakers in the United States (Modern Language Association 2014), among nearly 1.4 million people of Hungarian descent (Ryan 2013). Previous research on Hungarian in the U.S. is limited compared to more commonly studied minority languages. Fenyvesi (2005), in her excellent overview of the history and sociolinguistic situation of U.S. Hungarian, discusses five main studies of Hungarian-speaking communities in the Midwest, most carried out in the 1990s. These studies document bilingual communities in which language shift to English takes place within three generations (like most other minority languages in the U.S.), and in which the Hungarian of all speakers exhibits a variety of common language contact phenomena, including transfer, borrowing, and code-switching.

As expected, pragmatic features like focus were among the ways in which US Hungarian was found to be affected by language contact. According to Fenyvesi (2005:298):

> In [American Hungarian] there are numerous violations of focus-related features reported for South Bend (Kontra 1990:75–79, 82), Detroit (Bartha 1993:138), and McKeesport (Fenyvesi 1995:75–80). Sometimes focus movement is completely lacking; in such examples speakers give emphasis to a constituent through primary sentential stress. Sometimes a phrase other than the phrase the speaker means to emphasize occurs in the preverbal position, and the emphasized phrase gets primary stress in a postverbal position.

While there is evidence that focus in bilingual Hungarian is different than in Hungarian in Hungary, as expected, there is limited quantitative data available, and none from a more controlled experimental setting. Fenyvesi (2006) reports quantitative results from her survey of

participants in Toledo, Ohio, who performed a limited number of structured tasks probing specific syntactic structures after a sociolinguistic interview. The sole question investigating focus was a forced-choice task that gave participants a *wh*-question requiring an answer with focus and asked them to choose between a sentence with preverbal focus movement and one without. American Hungarian speakers chose the non-focus-movement option about half the time, whereas Hungarian speakers in Hungary chose focus movement more than 90% of the time. This is the only quantitative data on the subject of which I am aware, and it is obviously limited to a single case. Furthermore, nearly all the 18 American Hungarian speakers were not born in the U.S.; there is no systematic data on heritage speakers of Hungarian.

The present study fills these gaps in the literature. Focus, although widely studied in the theoretical literature on Hungarian, has been the subject of relatively little experimental work in general, and the data on bilingual populations in particular is limited. Further, focus in heritage Hungarian has never been studied before. Yet the data provided by an experimental investigation of focus in bilingual Hungarian has important theoretical implications, both for understanding bilingual grammars (as seen in section 2) and for theories of focus in Hungarian (as seen in section 3). In order to contribute in these two areas, this study addresses the following research questions.

(10) **Research questions**
 RQ1. What focus realization strategies are acceptable for heritage speakers and L1-dominant native speakers of Hungarian?
 RQ2. How is preverbal focus interpreted by heritage speakers and L1-dominant native of Hungarian?
 RQ3. Do both groups display special vulnerability at the syntax/discourse interface? If so, in what way?

5   Methods

An aural contextualized acceptability judgment task (AJT) was conducted, consisting of three separate experiments to test the realization of focus, the interpretation of focus, and, as a control category, the realization of *wh*-questions.

5.1   Participants

There were 32 participants, divided into two groups based on language background, as reported on the LEAP-Q (Marian, Blumenfeld & Kaushanskaya 2007) and another background questionnaire. Participants also completed a forced-choice cloze test measuring English proficiency (Ionin & Montrul 2009, 2010; Ionin, Montrul & Crivos 2013; Montrul 2001). Unfortunately no direct proficiency measure in Hungarian was available; I report participants' self-reported Hungarian proficiency from the LEAP-Q, which has been shown to be a reliable measure of proficiency for other languages (Marian, Blumenfeld & Kaushanskaya 2007).

Table 1 presents a summary of participant characteristics.

Table 1. Participant Characteristics

	Heritage (n = 17)	Native (n = 15)
Age range	20-82	32-72
Mean age	43.8	53.5
Gender (# male / # female)	11 F / 6 M	11 F / 4 M
Mean # of years of schooling	16.1	16.6
Mean # of years in the U.S.	42.2	24.9
Mean age of acquisition	Birth	Birth

Mean self-reported proficiency (average of self-reported proficiency in speaking, understanding, and writing; 1-10, 1=low, 10=high)	7.7	9.7
Mean daily use with family and friends (self-reported rating; 1-10, 1=almost never, 10=always)	4.0	6.2
Mean daily use for TV, radio, reading (self-reported rating; 1-10, 1=almost never, 10=always)	1.8	4.4
Mean years of formal study	2.6	12.9
Mean age of acquisition	4	21.3
Mean self-reported proficiency (average of self-reported proficiency in speaking, understanding, and writing; 1-10, 1=low, 10=high)	9.7	8.4*
Mean daily use with family and friends (self-reported rating; 1-10, 1=almost never, 10=always)	7.8	6.1*
Mean daily use for TV, radio, reading (self-reported rating; 1-10, 1=almost never, 10=always)	8.9	7.8*
Mean years of formal study	14.7	5.5
Mean proficiency test score (max. 40)	39.5	37.5

*One person did not finish the questionnaire and so did not answer all the questions about English; these are the means for the remaining participants.

The *heritage speaker* group (n = 17) was made up of Hungarian/English bilinguals who began learning both languages before the age of 7, such that they were simultaneous or early sequential bilinguals. They were all either born in the U.S. or arrived before age 7 and were educated in the U.S. They reported higher proficiency in English than Hungarian and greater use of English on a daily basis. They scored at ceiling on the English proficiency test.

The *native speaker* group (n = 15) was made up of Hungarian/English bilinguals whose first language was Hungarian and who learned English as adults. They were born in either Hungary or Romania and educated in either Hungarian or Romanian, at least through middle school (and in most cases, through high school or college as well). They arrived in the U.S. after age 14 and had no significant exposure to English prior to that, with a mean age of English

acquisition of 21.3 years. They had all lived in the U.S. for at least 5 years, most substantially

longer. They reported higher proficiency in Hungarian than English, although they rated their

English proficiency fairly high and also score near ceiling on the English proficiency test. They

report using roughly the same amount of Hungarian and English when talking with friends and

family, although they use more English for media. It is likely that this group acquired

monolingual-like L1 Hungarian grammars, although these speakers may have undergone attrition

during their time living in the U.S. I have chosen to refer to this group as "native speakers"

despite the fact that I recognize that heritage speakers are also native speakers in order to make

clear that this group was raised in a Hungarian-dominant environment,[9] unlike the heritage

speakers, whose input was likely reduced or restricted in some way.

This group was included as the control group (instead of a monolingual control group)

because they share essential characteristics with the generation that provided that input to the

heritage speakers. This is the appropriate control group to test the hypotheses under

consideration, because these groups make it possible to distinguish between "individual and

intergenerational attrition" (Sorace 2012:214) in order to test the IH. In other words, including

the L1-dominant native speakers as the control group allows us to distinguish between areas of

divergence from monolingual Hungarian that are already present in the input due to attrition or

other contact features on the part of the native speakers and those that arise in the heritage

speakers despite presumably not being present in the input, as a result of transfer or processing

difficulties (Pascual y Cabo 2013; Pascual y Cabo & Rothman 2012). In this way, I follow

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[9] Even those who were from Romania and educated in Romanian were from a part of Romania that is historically

Hungarian speaking, where the majority language outside of school was Hungarian. This is substantially different

from minority languages in an immigration context like the United States.

previous work on heritage grammars (Leal, Rothman & Slabakova 2014; Leal Méndez, Rothman & Slabakova 2015) in responding to the criticism of studies comparing heritage speakers, who are always bilingual, to monolinguals rather than to other bilinguals, while also addressing Sorace's concerns regarding testing the IH with heritage speakers. Of course, much like studies of language change that use data from speakers of different ages collected synchronically to show changes in "apparent time," I recognize that the equation of these native speakers with the input providers for the heritage speakers is based on assumptions about their grammars due to their backgrounds and not on directly measuring the input the heritage speakers received, so we cannot be certain that this comparison group represents the baseline variety that the heritage speakers acquired in childhood (although some of the native speakers were in fact the parents of the some of the heritage speakers). Nonetheless, choosing a comparison group that is substantially similar to the speakers who provided the baseline variety to which heritage speakers were exposed allows for comparisons that are relevant to the research questions.

All participants had at least a high school education, and most had a college education or beyond. Unlike many studies of heritage speakers, both groups had a wide age range. All participants were naïve, in that they were neither linguists nor students of linguistics, and participants who reported cognitive or linguistic disabilities were not included.

5.2   Procedure and materials

All three experiments were conducted in a single session, so the procedure was the same for all the stimuli. Participants first completed a training session. The training included instructions which explained the purpose of the experiment was to investigate how conversations fit together in Hungarian, and that they should pay attention to "whether [sentences] sound natural or not" in the particular context given. The instructions walked participants through

several types of examples, including (i) sentences that were ungrammatical, to familiarize them with the idea of making judgments, (ii) examples of grammatical sentences with different word orders in different contexts, to familiarize them with the idea of contextual felicity, and (iii) examples of grammatical sentences with different stress patterns, to familiarize them with the idea that prosody can affect contextual felicity. For each of the examples, they were explicitly instructed to pay attention to how the relevant factor affected their judgments, although the examples were presented without saying which was the 'right' judgment, and they were told that more than one sentence in any given trial could be rated high or low. They were told that during the experiment they would rate sentences ranging from "very strange or unnatural" to "perfectly natural" specifically with regard to the conversation in which the sentence appeared. Participants then completed several practice items to get used to using the scale.

The main section of the experiment consisted of a 24 judgment trials. All three experiments followed the same format. Each trial consisted of a brief setup story, followed by a conversation made up of three sentences. The critical stimulus was always the second sentence; the first and third sentences served as context. In all the trials, the context sentences were spoken by 'Renáta' and the critical stimulus by 'Ádám.' Participants were instructed to judge how Ádám's sentence sounded in the context provided by Renáta's sentences, and the critical sentence (Ádám's) appeared on the screen in bold. An example trial is in (11).

(11) Pál abban az irodában főnök, ahol Ádám és Renáta dolgoznak, és minden héten meghív egy alkalmazottat ebédre, hogy jobban megismerje őket.

Renáta: Kit hívott meg Pál ebédelni ezen a héten?
Ádám: Pál Jancsit hívta meg ebédre.
Renáta: Az jó ötlet volt, mert nem ismerik egymást nagyon jól.

'Paul is the boss in an office where Adam and Renata work, and every week he invites one employee to lunch in order to get to know them better.

Renata: Who did Paul invite to lunch this week?
Adam: Paul invited [Jancsi]$_F$ to lunch.
Renata: That's good. They don't know each other that well.'

All of Ádám's sentences (the critical items) were recorded by the same male native speaker of Hungarian, who also recorded all the initial stories. The two context sentences were recorded by the same female native speaker of Hungarian. All the sentences were recorded in isolation from each other.

After participants had heard and judged the conversation once, the critical sentence disappeared and was replaced with a different critical sentence for that context, and then the conversation, including both context sentences but not the story, was repeated aloud. So in (11), for example, Ádám's sentence would disappear and be replaced by another item for that context (like *Pál meghívta Jancsit ebédre*). Participants then heard the conversation anew with that sentence. Because there were two or three stimuli for each trial, depending on the experiment, participants heard the same conversation two or three times. To control for ordering effects, the order in which the stimuli were presented in the trials of any one experiment was set using a pseudo-Latin square design. That is, for a context like (11) for example, participants sometimes saw a critical sentence with preverbal focus first but other times saw it second or last, with a different sentence type presented first.

The decision was made to present all the stimuli for a given context story as one trial based on the results of a previous pilot study (Hoot 2012) that found this method to be more effective than presenting each critical item separately in its own trial for enabling participants to distinguish the sometimes subtle changes in contextual appropriateness produced by differences in intonation and word order. It also follows several other studies of information-structural

phenomena (e.g., Leal, Rothman & Slabakova 2014; Lozano 2006, among others) in presenting the possible sentences together. While this method of presentation has the advantage of making it easier for participants to distinguish between items, and although the order of the conditions was rotated across trials, it nonetheless opens up the possibility of effects of presentation order on the ratings. In order to control for this possibility, the linear mixed models used to analyze the data (see section 5.3) included presentation order as a fixed effect, although it was not found to be significant for any of the experiments.

The stimuli for all three experiments were carefully checked to control for potential confounds in four ways. First, to ensure that stimuli were comprehensible, the critical stimuli only included words taken from among the most common 100,000 Hungarian words (Halácsy et al. 2004).[10] Second, they were checked for comprehensibility and grammaticality by two monolingually raised native speakers of Hungarian, who were from different regions and generations (one older and from Romania, one younger and from Budapest) to avoid potential dialect differences. Third, after the main task a lexical comprehension questionnaire was administered to all participants, explicitly asking if the experiment had included unfamiliar words and eliciting English translations of a representative set of the Hungarian sentences that appeared in the study. One participant who indicated difficulty understanding the stimuli was excluded from the results (and is not included in the count above); everyone else indicated they understood the stimuli. Fourth, for Experiments 1 and 2, intonation was carefully controlled, as explained in detail in section 6.1.

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[10] According to the Hungarian Webcorpus, available at http://mokk.bme.hu/en/resources/webcorpus/.

The experimental session consisted of two blocks, rotated for each participant to control for ordering effects. Each block had twelve trials, which were pseudo-randomized, such that no two consecutive trials repeated the same experiment. Five lexicalizations were created for each experiment, so fifteen trials were experimental trials. Because they were intermixed, each experiment served as distractor items for the others, as is common practice in experimental research (Schütze & Sprouse 2013). Additionally, there were nine filler trials, of which five tested a different structure and four were repeated trials from the main experiments that were included in order to detect inconsistencies or other problems in participants' answers. Judgments made in the repeated trials were used to check the dataset for problems and then discarded. For any given experiment, then, there were five experimental trials and nineteen filler trials. Overall, participants judged 66 sentences across the 24 trials. An error was discovered after testing in one of the trials from Experiment 1, so it was discarded; that leaves 63 judgments per person, of which 26 were fillers, so the final data set consisted of 37 critical judgments per participant.

After completing the experimental task, participants completed language background and proficiency questionnaires, discussed in section 5.1.

For the sake of coherence, I discuss each experiment in turn in sections 6-8, first presenting the stimuli, then the results, then a brief discussion. Before turning to that, though, it is necessary to discuss how the data was processed.

5.3   Data processing and statistical analysis

Ratings were z-score transformed, following Schütze and Sprouse (2013). These standardized scores represent each judgment in units of standard deviations from that participant's mean rating, which reduces problems like scale compression and skew. All

statistical tests were performed on the transformed scores, but the raw ratings are presented in Appendix A.

For each experiment, a linear mixed-effects model was fit, with fixed effects for *group*, *condition*, and *presentation order*. Repeated measures and variation due to lexical items were modeled by including random effects for *participant* and *lexicalization*. The maximal random effects structure relevant to the experiment's design that converged was used (Barr et al. 2013), and random effects always had the variance components covariance structure. For Experiments 1 and 3, the models included a random intercept for participant and lexicalization, as well as a random slope for participant over condition and a random slope for lexicalization over condition × group; for Experiment 2, no models including a random slope converged, so that model contains only the random intercepts for both factors. Fixed effects were compared with a Type III sum of squares. Presentation order was never a significant effect according to this test, but it was retained in the model nonetheless in order to control for possible ordering effects.

6   Experiment 1

6.1   Materials

The first experiment tested the realization of focus. The context for these items required a critical stimulus with unambiguous identificational focus on the direct object. The first context sentence ended in a *wh*-question targeting the direct object, and the context story made it clear that the question required a single, exhaustive answer: e.g., *Who did John call up?* in a context in which John was on a game show and could only call up one person to help him get the answer. The answer consisted of a sentence with a transitive verb, which was always a verb with a VM, whose subject and object (the focus) were always human and definite. In addition to the subject,

verb, VM, and object, each sentence ended in an adjunct (like *tegnap* 'yesterday' or *ebédre* 'for lunch').

The experiment had three conditions: (i) the Preverbal Focus condition, in which the focus appears before the verb, triggering inversion of the verb and its VM, and with emphatic stress; (ii) the Stress In Situ condition, in which the focus appears postverbally, with no V/VM inversion, but with an emphatic stress; and (iii) the Neutral condition, in which the focus appears postverbally and the sentence has the stress pattern for a so-called 'neutral' sentence, with stress falling on the first constituent in the predicate, in this case the VM. These are shown in Table 2.

Table 2. Experiment 1 Stimuli

Condition	Characteristics	Example
Preverbal Focus	Stressed focus preverbal with V/VM inversion	János MÁRIÁT hívta fel tegnap. John Mary-ACC called VM yesterday
Stress In Situ	Stressed focus postverbal without V/VM inversion	János fel hívta MÁRIÁT tegnap. John VM called Mary-ACC yesterday
Neutral	Focus postverbal without V/VM inversion; neutral stress on VM	János FEL hívta Máriát tegnap. John VM called Mary-ACC yesterday

Monolingual Hungarian speakers would be expected to accept the Preverbal Focus condition, which is the canonical realization of focus discussed in section 3. The Neutral condition, which would be appropriate for an out-of-the-blue broad-focus sentence, should be infelicitous for all speakers, since it does not mark the focus as prominent. The Stress In Situ condition is included to allow for the possibility of transfer from English. Because the most natural response in English to a *wh*-question like the ones use here is to mark the focus in situ using stress, assessing whether transfer or cross-linguistic influence had taken place requires the inclusion of a condition that overlaps with the English pattern, in which the focal constituent is made prominent with stress but no syntactic movement takes place.

Clearly, stress plays an important role in these stimuli, and so it was necessary to carefully control for it in all the sentences. Section 3.2 described Hungarian stress, and for all the critical stimuli in this experiment, the pitch tracks were examined visually using Praat (Boersma & Weenink 2012) to confirm that they reflected the patterns discussed there. When recording the stimuli, multiple takes were done of each item and the best example was chosen for the experiment. Specifically, for the Preverbal Focus condition all stimuli had a high tone on the stressed syllable of the focal word (which was the highest peak of the sentence) followed by a steep drop to a low tone, and the postfocal constituents had low pitch with minimal variation; that is, they were clearly deaccented. The same was true for the Stress In Situ condition, except that this stress pattern occurred on a focal word that appeared postverbally. Because the focus appeared postverbally in this condition, the sentence-final adjunct, which would normally have its own pitch accent, was deaccented to create the 'eradicating' effect that is important to the perception of focal stress. Finally, in the Neutral condition, each prosodic word had some form of H+L pitch accent, with the highest peak on the iP-initial word, which was always the VM, attached to the verb.
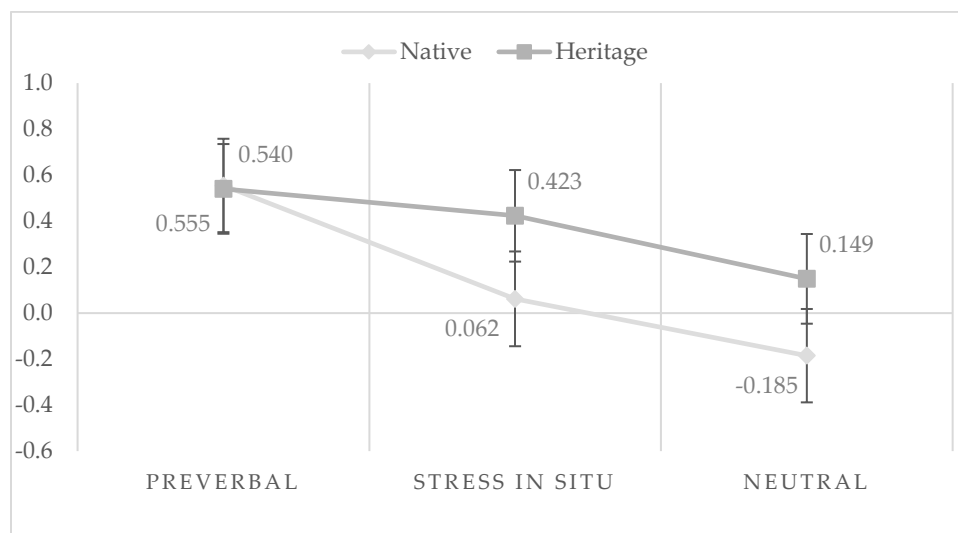
6.2   Results

The results for Experiment 1 are shown in Table 3, which reports estimated marginal mean z-scores for each group on each condition. Figure 1 shows the same results.

Table 3. Experiment 1 Results

Condition	Example	Heritage Speaker Mean Z-score	Native Speaker Mean Z-score
Preverbal Focus	János MÁRIÁT hívta fel tegnap. John Mary-ACC called VM yesterday	.540	.555

Stress In Situ	János fel hívta MÁRIÁT tegnap. John VM called Mary-ACC yesterday	.423	.062
Neutral	János FEL hívta Máriát tegnap. John VM called Mary-ACC yesterday	.149	-.185

Figure 1. Experiment 1 Results

The Type III sum of squares test for fixed effects found a significant effect for condition (F = 6.17, *p* = .009) but no main effect for group (F = 2.16, *p* = .162) and no group by condition interaction (F = .85, *p* = .446). Given the lack of interaction, these results do not show evidence of different patterns between the groups, so pairwise comparisons were conducted by condition only (with a Bonferroni correction for multiple comparisons). These reveal a significant difference overall between the Preverbal and Neutral conditions (*p* = .007), but no significant differences between either of these and the Stress In Situ condition. Given that no significant difference was found between Stress In Situ and either of the other two conditions, the question naturally arises whether this condition can be said to be the same as either of the other two. I performed two TOST equivalence tests to examine this possibility (Kizach & Juzek in prep.). In order to be maximally conservative, given that multiple tests were performed (four t-tests in

total), I set the alpha level for these two tests at .01 instead of .05.[11] These tests did not find the Stress In Situ condition to be equivalent to either of the other conditions. Overall, then, the results for the Stress In Situ condition are inconclusive: there is no evidence that it is either different from or the same as either of the other two conditions.

6.3 Discussion

Experiment 1 was designed to answer the first research question, which concerns which focus realization strategies are acceptable for bilingual speakers of Hungarian. What is relevant in answering this question is what distinctions are made by each group among the three possible structures. The results do not present evidence of different patterns between the two groups. This lack of difference does not necessarily mean the two groups behave the same, only that we do not have evidence that their patterns are different, and it is possible that the statistical effects are driven by the native speakers, who had a greater range between the Neutral and Preverbal Focus conditions. Nevertheless, visual inspection of the data supports the idea that both groups trend in the same direction, and, given that we cannot claim that the groups are different, it is only possible to report the overall pattern shared by both groups.

Overall, these speakers are able to discriminate between Preverbal Focus and Neutral sentences in contexts requiring narrow identificational focus. This result supports the general picture of how focus is realized in Hungarian described in the theoretical literature (e.g., É. Kiss 1998, 2010; Kenesei, Vago & Fenyvesi 1998).

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[11] Unlike the pairwise comparisons in the main model, post hoc corrections for multiple comparisons (like Bonferroni) are not available for this test, so instead I chose to adjust the alpha level manually.

On the other hand, evidence was not found for a distinction between the Stress In Situ condition and either of the other two conditions, but neither was there evidence for Stress In Situ being equivalent to either of the other two. The inconclusive result for Stress In Situ could have several possible interpretations. First, recall from section 3 that the status of postverbal focus in Hungarian is debated in the literature, and there is little consensus about its acceptability or its properties, which may be reflected in the ratings here. Second, it may be that participants have difficulty perceiving the difference in stress between Stress In Situ and Neutral, which had identical word order. This could result in the ratings for the Neutral condition being artificially inflated, as participants perceive the anomalous stress to be merely an unusual stress pattern but not something that communicates a different information structure, especially given that these sentences were always presented in context. There is some evidence that prosodic differences can be difficult to incorporate into judgments. For example, Chen (2010) found that intonation played a role processing (affecting how fast participants made judgments) but did not affect their judgment of whether a sentence was correct or incorrect in context. Similarly, Vogel and Raimy (2002) found that English-speaking children produce word- and phrase-level stress correctly from an early age, but have difficulty distinguishing meaning using stress, a difficulty that is somewhat (but not entirely) overcome in adulthood. These findings may point to a general difficulty for participants making judgments based on prosody. If so, it may be that the present participants rated the Neutral condition higher than they otherwise might have, rather than distinguishing it from the Stress In Situ condition. This could be reducing the statistical significance of the findings of the present study—had the Neutral condition been rated lower, it is possible that a significant distinction would have been made between it and Stress In Situ. However, if this is true, it makes the distinction between the Preverbal Focus condition and the

Neutral condition that much more noteworthy, given that the Neutral condition is rated significantly lower than Preverbal despite this confound.

Despite the inconclusive result for Stress In Situ, the fact that the groups were not found to differ and that the overall pattern is to distinguish between the other two conditions can be taken to indicate that these speakers are able to make contextually constrained judgments, and that the judgments of both groups pattern with expectations from the literature.

7 Experiment 2

7.1 Materials

The second experiment tested the interpretation of focus, adapting the design used by Onea (2009) and Onea and Beaver (2011) discussed in section 3.2. The first context sentence included a preverbal exhaustive focus construction (e.g., *János PÉTERT hívta fel* 'John called up [Peter]$_F$') that the second speaker contradicted (e.g., by saying that John also called Mary). The three possible ways to contradict the focal sentence constituted the three conditions of the experiment: (i) the Agreement condition, which began with *Yes, and…*, indicating no interpretation of exhaustiveness assigned to the preceding focal sentence; (ii) the Pragmatic Negation condition, which began with *Yes, but…*, indicating that the exhaustiveness of the preceding focal sentence was interpreted as a cancelable pragmatic implicature; and (iii) the Semantic Negation condition, which began with *No…*, indicating that the exhaustiveness of the preceding focal sentence was interpreted as part of the truth-conditional semantics. Examples are shown in Table 4.

Table 4. Experiment 2 Stimuli

Condition	Characteristics	Example (Context: John called up [PETER]$_F$.)
Agreement	Yes, and…	Igen, és Máriát is fel hívta. 'Yes, and he also called up Mary.'
Pragmatic Negation	Yes, but…	Igen, de Máriát is fel hívta. 'Yes, but he also called up Mary.'
Semantic Negation	No…	Nem, Máriát is fel hívta. 'No, he also called up Mary.'

Although the design adapts Onea and Beaver's test, the materials used were not the same. Another difference is that theirs was a forced-choice task in which participants chose the best response for the context, so their results were reported as the percentage of the time that a given option was chosen. My experiment, on the other hand, used an AJT with ratings on a five-point scale, so participants did not have to choose only one sentence for any given trial. Since one of the hypotheses this study was designed to test (the IH) predicts optional or variable interpretations at the syntax/discourse interface, it was important that the experiment reflect such optionality by allowing participants to rate more than one structure highly.

Since participants heard a sentence with focus as part of the context, in the second experiment it was important to control for the stress pattern on the preverbal focus that appeared in the context sentence. All such sentences were checked to ensure that they correctly instantiated focal stress, using the same procedure discussed in the previous section.

7.2 Results

The results for Experiment 2 are shown in Table 5 and Figure 2.

Table 5. Experiment 2 Results

Condition	Example	Heritage Speaker Mean Z-score	Native Speaker Mean Z-score

Agreement	Igen, és Máriát is fel hívta. 'Yes, and he also called up Mary.'	.694	.583
Pragmatic Negation	Igen, de Máriát is fel hívta. 'Yes, but he also called up Mary.'	.597	.446
Semantic Negation	Nem, Máriát is fel hívta. 'No, he also called up Mary.'	-1.423	-.519

Figure 2. Experiment 2 Results
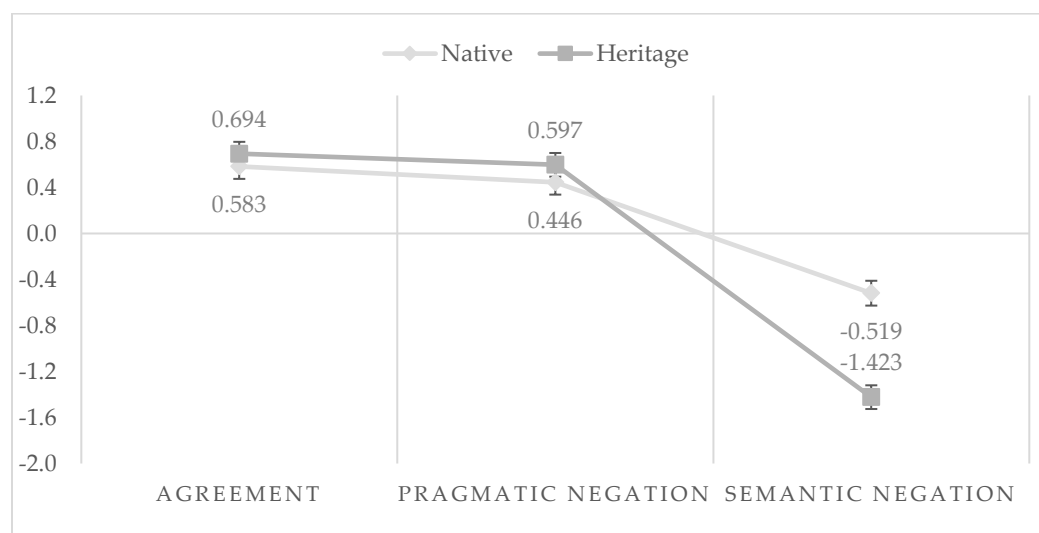
A Type III test of fixed effects revealed a significant effect for condition (F = 220.67, $p <$ .001), a significant effect for group (F = 7.14, $p = $ .019), and a group by condition interaction (F = 25.53, $p < $ .001). Here, although all three effects were statistical, they are not all equally meaningful: both the group difference and the interaction are likely driven by the slightly higher ratings by the native speaker group in the lowest-rated condition. However, the only relevant result is the pattern of ratings for each group, and both groups have the same pattern. Pairwise comparisons (with the Bonferroni correction) were made between the three conditions for each group. The native speaker group rates both Agreement ($p < $ .001) and Pragmatic Negation ($p <$ .001) significantly higher than Semantic Negation, but they do not distinguish between the

higher-rated structures ($p = .803$). The heritage speaker group likewise rates Semantic Negation lower than both Agreement ($p < .001$) and Pragmatic Negation ($p < .001$), which they do not distinguish from each other ($p = 1.00$).

7.3 Discussion

The second experiment pertains to the second research question, which concerns the interpretation of preverbal focus. Both groups showed the same pattern: both the Agreement and Pragmatic Negation conditions were rated much higher than Semantic Negation. Clearly, neither group of speakers interprets focus as semantically exhaustive. This result aligns with previous experimental work that concluded Hungarian focus is not semantically exhaustive, supporting the view that it is a pragmatic implicature (Gerőcs, Barbarczy & Surányi 2014; Kas & Lukács 2013; Onea 2009; Onea & Beaver 2011). Even under a reinterpretation of the *Yes but* test to indicate non-at-issueness rather than the source of the inference (Destruel et al. 2015), it is clear that these speakers do not regard the exhaustive property of focus to be part of the semantics.

It is noteworthy that, for these speakers, the exhaustive interpretation appears to be optional: both groups rated Agreement just as high as Pragmatic Negation, which was unexpected, as Onea and Beaver found that the latter interpretation was the most preferred. Similarly, Destruel et al. (2015) found for English and French clefts that the *Yes but*, answer was preferred over *Yes and*, but here they are rated equally high. It is possible that the difference between my results and theirs may be due to task effects; the results of my AJT and their forced-choice tasks may not be directly comparable, because the AJT allows participants to rate more than one structure equally high. Nonetheless, the AJT found that Agreement was as acceptable as Pragmatic Negation for contradicting identificational focus, which is unlike previous results.

Additionally, an anonymous reviewer points out that if the exhaustiveness inference is optional for these speakers, the results of Experiment 2 could help explain the inconclusive status of the Stress In Situ condition in Experiment 1: if exhaustive contexts are not so strongly associated with preverbal focus for these speakers, the acceptability of postverbal focus relative to preverbal in such contexts might be increased, leading to less of a distinction between preverbal and postverbal focus realization.

8 Experiment 3

8.1 Materials

The third experiment tested the syntax of *wh*-questions, which share similar surface properties with focus but are not conditioned by the syntax/discourse interface, and so serve as a good control category against which to compare the results of Experiment 1. There were two conditions: (i) the Well-formed condition, which included V/VM inversion; and (ii) the Ill-formed condition, which had no inversion, and which are plainly ungrammatical in Hungarian. These are shown in Table 6.

Table 6. Experiment 3 Stimuli

Condition	Characteristics	Example
Well-formed	V/VM inversion	Kit hívott fel János? who-ACC called VM John
Ill-formed	No inversion	Kit fel hívott János? who-ACC VM called John

8.2 Results

The results for Experiment 3 are shown in Table 7 and Figure 3.

Table 7. Experiment 3 Results

Condition	Example	Heritage Speaker Mean Z-score	Native Speaker Mean Z-score
Well-formed	Kit hívott fel János? who-ACC called VM John	.602	.664
Ill-formed	Kit fel hívott János? who-ACC VM called John	-1.058	-1.856

Figure 3. Experiment 3 Results
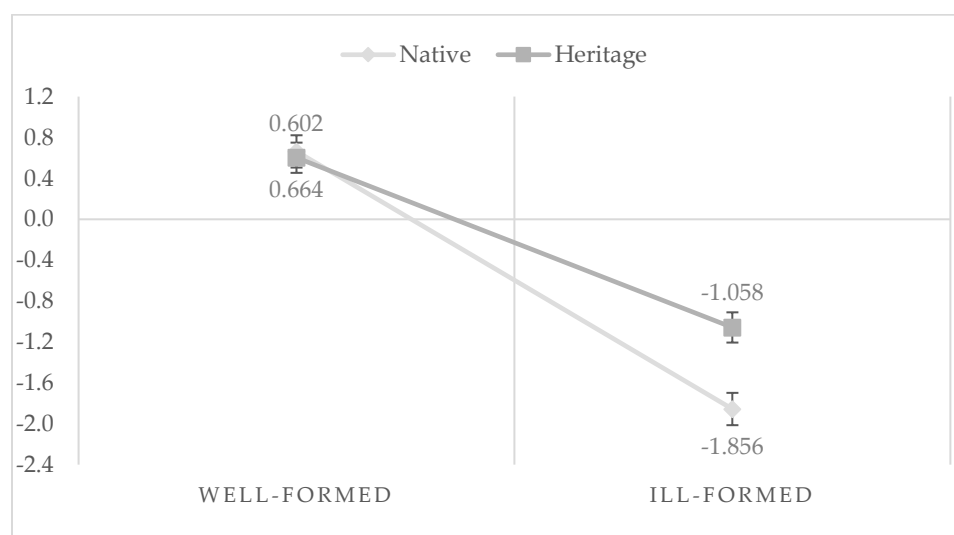
In this experiment, tests of fixed effects revealed a significant effect for condition ($F = 195.32$, $p < .001$), a significant effect for group ($F = 5.74$, $p = .031$), and a group by condition interaction ($F = 8.33$, $p = .012$). As before, the overall model is not the result of interest: neither the effect for group nor the interaction are meaningful for the interpretation of the data, since the pattern of each group's judgments is the relevant result. Thus, pairwise comparisons were conducted (with the Bonferroni correction), which revealed that both groups make the same distinction between the Well-formed and Ill-formed conditions (native speaker group: $p < .001$; heritage speaker group: $p < .001$).

8.3 Discussion

The third experiment was included as a comparison to the previous two: since *wh*-questions have similar surface syntax but are not regulated by the interface, comparing them to the other two experiments could shed light on the third research question, which was whether these bilinguals display special vulnerability at the syntax/discourse interface when compared to narrow syntax. In Experiment 3, both groups judged *wh*-questions just as expected for monolinguals, whereas in Experiment 2 they displayed some divergence from expectations. In other words, vulnerability was not observed for *wh*-questions, but it is for focus interpretation, suggesting that indeed the interface is more vulnerable than pure syntax. However, the vulnerability of the interface does not extend to focus realization, manifesting only in the interpretation experiment.

9 General discussion

9.1 Differential vulnerability at the interfaces

The results of the present study indicate some vulnerability at the syntax/discourse interface, but it is not uniform. Both bilingual groups pattern as expected for monolingual native speakers with regard to narrow syntax and focus realization, but differ slightly in focus interpretation, accepting non-exhaustive readings of identificational focus to the same degree as (pragmatically) exhaustive readings.

This data aligns with previous studies of focus in the grammars of other bilinguals, including Spanish/English bilinguals (Hoot 2017; Leal Méndez, Rothman & Slabakova 2015) and Greek/Russian bilinguals (Tsimpli & Sorace 2006), who are able to successfully judge the syntactic and prosodic realization of focus. In fact, the non-variable realization of focus in Greek

by Greek/Russian bilinguals is what led Tsimpli and Sorace (2006) to propose distinguishing between internal and external interfaces: they claim that focus realization is at the syntax/semantics interface, which, as an internal interface, is not subject to the same computational complexity and is thus not problematic for bilinguals. However, the experimental literature on Hungarian focus, including Experiment 2 of the present study, suggests that the focus construction is not part of the semantics. It is also the case that the distribution of focus depends on the surrounding discourse context, indicating that its realization is governed by "pragmatic conditions that determine appropriateness in context" (Sorace & Serratrice 2009:197), which is one of the hallmarks of an external interface. So both conceptually and in light of the interpretation evidence, it seems reasonable to locate focus at the syntax/discourse interface.

If so, though, why should realization of focus be less vulnerable than interpretation? It may be that, even though both processes involve the syntax/discourse interface, choosing the appropriate sentence for a given context and assigning an interpretation to a given sentence tap into the interface in different ways: one is about the constraints imposed by the context on the possible syntactic forms of a sentence (pragmatics constrains syntax), and one is about the interpretations generated by a given sentence (syntax constrains pragmatics). It may be that the former is less vulnerable to processing difficulties for some reason, perhaps because it admits less variability than interpretation does. This conjecture receives some support from L1 acquisition of focus and intonation, in which children produce appropriate intonation and use focus constructions from an early age but have difficulty assigning interpretations based on prosody or focus movement until much later (Chen 2010; Kas & Lukács 2013; Vogel & Raimy 2002). However, previous studies have showed effects of bilingualism on the syntactic

realization of other discourse-sensitive structures (e.g., pronouns: Serratrice et al. 2012; Sorace et al. 2009), not just on their interpretation, and ultimately more research into the exact nature of proposed interface vulnerabilities is needed. Nonetheless, this data aligns with previous research in suggesting that the distinction is likely not between internal and external interfaces.

9.2 Sources of interface vulnerability

In section 2, I considered two main families of explanations for bilinguals' special vulnerability at the syntax/discourse interface: one that focuses on transfer of pragmatic features (Transfer Hypothesis; TH) and one that focuses on processing difficulty at external interfaces (Interface Hypothesis, IH). This section considers the results regarding interface vulnerability in light of each hypothesis in turn.

The TH predicts transfer of pragmatic features from one language to another. For focus realization, transfer from English should manifest as an extension of the applicable usage domains of postverbal focus by the transfer of pragmatic features from English, because this construction is at the syntax/pragmatics interface, there is surface overlap, and English is the more restrictive language. Furthermore, if dominance or age of acquisition plays a role, transfer is expected especially in those whose dominant language is English or who learned both languages as children, namely, the heritage speakers. This hypothesis is partially supported by the results of Experiment 1. The Stress In Situ condition was not found to be significantly worse than the Preverbal focus condition, which could be due to transfer from English. On the other hand, unequivocal evidence of transfer was not found either—it is certainly not the case that postverbal focus has displaced preverbal focus due to influence from English. Additionally, the expected difference between groups (i.e., more transfer for heritage speakers) was not observed.

For focus interpretation, whether these results are compatible with the TH depends on which English construction is assumed to be the equivalent structure whose interpretation can be transferred. If we take the English equivalent to be clefts or contrastive focus, both of which are interpreted as communicating pragmatic implicatures of exhaustiveness (Horn 1981, 2014), then there is no expectation of transfer, as the interpretation is the same in both languages. If, on the other hand, we take the fact that preverbal focus is the default question-answering construction in Hungarian to indicate that the equivalent English construction is in situ prosodic focus, which can be either contrastive/exhaustive or mere information focus, then the predictions would be different. In this case, since the English construction would have two interpretations (contrastive or information) and the Hungarian focus would have one, transfer would be predicted from Hungarian to English, because Hungarian is the more restrictive language, but there would be no expectation of transfer from English to Hungarian. On the other hand, if one adopts a view that gives dominance or language use a central role, transfer would be expected from English to Hungarian only for the heritage speakers, but not for the native speakers. Either way, although they may look descriptively like transfer from English, the observed results do not align with the TH's predictions

The IH, on the other hand, predicts optional or variable results for both experiments, not transfer, as it hinges on processing difficulty due to the need to integrate information from multiple domains. For the native group, who are now bilingual and have lived in the U.S. for a long period, presumably undergoing some attrition, the IH predicts optional judgments that do not respect restrictions on contextual appropriateness. Although the Stress In Situ results were inconclusive, it is clear that this group can indeed distinguish the difference between felicitous

(Preverbal Focus) and infelicitous (Neutral) constructions in context. They do not display optionality in this sense.

The heritage speakers do not appear to pattern differently from the natives, so their focus realization data does not provide support for the IH either. As previously mentioned, Sorace (2011) excludes heritage speakers from the reach of the IH on the grounds that "inter-generational attrition" is different than the L1 attrition the IH is meant to account for, yet the present study includes bilingual native controls in order to account for these differences, which is a situation in which Sorace (2012) accepts the application of the IH to heritage speakers. As such, the heritage speakers' results are relevant for the IH, and in this case clear evidence was not found to support it.

Evidence in favor of the IH is found from both groups in the second experiment, though. In this case, the IH predicts optionality as well, which is what is observed: both groups differ somewhat from the monolinguals in the literature, accepting both Agreement and Pragmatic Negation. It seems reasonable to assume that this optionality does not extend to the Semantic Negation condition precisely because it involves semantics: the IH only predicts optionality among available pragmatic interpretations, so if exhaustiveness of the sort provided by explicit *only* is not available for semantic reasons it will not be vulnerable to the same interface processing difficulties.

In summary, the focus realization does not provide strong evidence in favor of either hypothesis, while the interpretation data, where the only interface vulnerability is found, is more compatible with the IH than with the TH.

9.3   Heritage language acquisition and input

Although they are consistent with the IH, the heritage speakers' interpretation results may simply reflect the input to which they were exposed. It is possible that, like the native speaker group, the heritage speakers are inconsistently accessing two competing interpretations of preverbal focus due to limited processing resources. However, given that the native speaker group already shows vulnerability in this domain, and given that the native speaker group shares essential characteristics with the speakers who provided input to the heritage speakers, it seems possible that the heritage speakers received input in which focus was used in contexts with non-exhaustive interpretations. Thus, it may be that these speakers have completely acquired the variety to which they were exposed and that no additional effects of reduced input need necessarily be assumed to explain this result. That said, we can only speculate about the input the heritage speakers received. If the native speakers' optional interpretation of focus is the result of attrition, it may not have appeared until later—their grammars would not be attrited when they first arrived, after all. It is thus possible that both groups display this optionality due to general effects of bilingualism, as predicted by the IH. Still, it is important to note that the heritage speakers' grammars to not appear to diverge in this regard from the baseline variety spoken by the previous generation.

Likewise, the heritage speakers' results on the other two experiments indicated grammars that are not significantly different from those of the monolingually raised native speakers, indicating successful acquisition of the baseline variety to which they were exposed. In all three experiments, the heritage speakers patterned with the native speakers. The present study does not find new evidence of incomplete acquisition, attrition, or other factors unique to heritage speakers when compared to the baseline. This finding is in line with several previous studies of

heritage speakers and information structure, which found that this linguistic domain was not as vulnerable as expected in this population (Hoot 2017; Leal, Rothman & Slabakova 2014; Leal Méndez, Rothman & Slabakova 2015).

9.4 Limitations

Several limitations of the present study are worth recognizing. First, because the experiments were similar in nature and served as fillers for one another, it is possible participants developed extralinguistic strategies for the task. In a similar vein, it is possible that the inclusion of some stimuli that were plainly ungrammatical (the ill-formed *wh*-questions) alongside those that were merely contextually infelicitous because of prosody may have had an effect, possibly compressing some of the ratings, especially in the first experiment. This may have resulted in insufficient power to be able to find clear distinctions in Experiment 1. Finally, because I decided to include a bilingual rather than monolingual control group, although it is possible to compare to the previous literature, we cannot know how monolinguals would have responded on the same tasks. The issue of the appropriate control group to compare with heritage speakers is a thorny one, and I have previously outlined the advantages of using a bilingual group, but the ideal might be two have both control groups, which I was unable to include here.

10 Conclusion

This study makes a novel contribution by providing new evidence on the realization and interpretation of focus in Hungarian, which has not been extensively studied using experimental methods, and by concentrating on heritage speakers of Hungarian, a population which has received limited previous study. The most important empirical findings are: (i) bilingual speakers of Hungarian accept preverbal over neutral word orders to realize identificational focus,

supporting descriptions in the theoretical literature; (ii) all speakers interpret the exhaustive

reading of focus constructions as an optional pragmatic implicature rather than part of the

sentence's semantics, supporting previous experimental work on focus interpretation and unlike

some theoretical accounts; (iii) limited evidence was found for a special vulnerability for

bilinguals at the syntax/discourse interface when compared to core syntax, and that vulnerability

only extended to the interpretation of focus, not its realization; and (iv) the two groups did not

differ, so no evidence of divergence from the baseline was found for the heritage speakers. With

regard to accounts of interface vulnerability in heritage language acquisition, neither those

approaches that appeal to transfer of pragmatic features nor those that appeal to processing

difficulty account for the full range of data. However, a hypothesis based on processing

complexity (like the Interface Hypothesis) was argued to be a plausible explanation for at least

some of the findings, while at the same time these results suggest some revisions to the

hypothesis.

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Appendix A. Raw Ratings

Tables A1-A3 present the untransformed mean ratings for each experiment.

Table A1. Experiment 1 Raw Ratings

Condition	Example	Heritage Speaker Mean Rating	Native Speaker Mean Rating
Preverbal Focus	János MÁRIÁT hívta fel tegnap. John Mary-ACC called VM yesterday	4.66	4.86
Stress In Situ	János fel hívta MÁRIÁT tegnap. John VM called Mary-ACC yesterday	4.31	3.86
Neutral	János FEL hívta Máriát tegnap. John VM called Mary-ACC yesterday	4.09	3.61

Table A2. Experiment 2 Raw Ratings

Condition	Example	Heritage Speaker Mean Rating	Native Speaker Mean Rating
Agreement	Igen, és Máriát is fel hívta. 'Yes, and he also called up Mary.'	4.88	4.83
Pragmatic Negation	Igen, de Máriát is fel hívta. 'Yes, but he also called up Mary.'	4.68	4.54

Semantic Negation	Nem, Máriát is fel hívta. 'No, he also called up Mary.'	1.58	2.97

Table A3. Experiment 3 Raw Ratings

Condition	Example	Heritage Speaker Mean Rating	Native Speaker Mean Rating
Well-formed	Kit hívott fel János? who-ACC called VM John	4.73	4.94
Ill-formed	Kit fel hívott János? who-ACC VM called John	2.05	1.06