

# Acquisition Of Adjective Morphology and Agreement In Split Contexts By Adult L1 Turkish / L2 Russian Speakers<sup>1</sup>

Dzmitry Kulsha<sup>1</sup>, Filiz Çele<sup>2</sup>

ORCID: <sup>1</sup>0000-0002-9021-674X, <sup>2</sup>0000-0002-1290-9217

<sup>1</sup>*Istanbul Aydin University, Department of English Language and Literature, Istanbul*

<sup>2</sup>*Istanbul Aydin University, Department of English Language and Literature, Istanbul*

[dkulsha@stu.aydin.edu.tr](mailto:dkulsha@stu.aydin.edu.tr), [filizcele@aydin.edu.tr](mailto:filizcele@aydin.edu.tr)

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**ABSTRACT:** This enquiry aims to examine whether L2 Russian adjectival morphology and adjective agreement in split contexts are acquirable by adult L1 Turkish learners at higher proficiency levels. Unlike Turkish, the Russian adjective is specified for case, number, and grammatical gender. The respective features, along with splitting, are not operational in Turkish. The Bottleneck Hypothesis Updated (Slabakova, 2019) predicts a full acquisition of this domain albeit it poses the highest level of challenge constituting a microparameter with complicated L1-L2 mapping, whereas the Interpretability Hypothesis (Tsimpli and Mastropavlou, 2007) claims it cannot be acquired. The research instrument is a *Semantic Entailments task* with short- and long-distance NP split d-linked wh-questions designed for the participants to assign the wh-word to either dative or accusative noun, respectively. The data came from adult L1 Turkish/L2 Russian learners and L1 Russian control group. The obtained findings suggest that functional morphology and adjective agreement in split contexts are successfully acquirable by the L2 population.

**Keywords:** L2 Russian, L1 Turkish, split d-linked wh-questions, uninterpretable features, adjective morphology

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<sup>1</sup> This study is part of ongoing research in the scope of a doctoral dissertation on a related topic.

**D1 Türkçe / D2 Rusça Olan Yetişkinlerin Rusçada Sıfatlara Eklenen ve Bölünmüş Ad Öbeklerinde Sıfat Uyuşmasını Sağlayan Biçimbilgisel Eklerin Edinimi**

ÖZ: Bu çalışma, anadili Türkçe (D1), ikinci dili (D2) ileri derecede Rusça olan yetişkinlerin D2 Rusçada sıfatlara eklenen ve bölünmüş ad öbeklerinde sıfat uyuşmasını sağlayan biçimbilgisel eklerin edinilip edinilmediğini incelemeyi amaçlamaktadır. Rusçada sıfatlar; durum, sayı ve dilbilgisel cins ekleri alırken Türkçede ise sıfatlar bu ekleri ve bu eklerle ortaya çıkan bölünmüş yapıları almazlar. Bottleneck Hipotezi (Slabakova, 2019), bu eklerin ve neden oldukları bölünmüş yapıların karmaşık D1-D2 eşlemeli bir mikro parametre oluşturan en yüksek zorluk seviyesini ortaya çıkarsa da D2’de bu yapıların tam olarak edinilebileceğini öngörmektedir. Interpretability Hipotezi (Tsimpli and Mastropavlou, 2007) ise D1’de olmayan bu yapıların yetişkinler tarafından D2’de edinilemeyeceğini savunmaktadır. Bu çalışmanın verileri D1 Türkçe/D2 Rusça konuşan yetişkinler ve D1 Rusça olan deneklerden anlamsal gerektirim (semantic-entailments task) testi kullanılarak toplanmıştır. Bu test akuzatif veya datif ekli ad öbeklerinin kısa veya uzun söylem-bağlantılı bölünmelerini içeren ‘ne-soruları’ndan oluşmuştur. Elde edilen sonuçları, Bottleneck Hipotezi’nin varsayımlarını desteklemektedir.

*Anahtar Sözcükler:* D2 Rusça, D1 Türkçe, bölünmüş söylem-bağlantılı ne-soruları, biçimbilgisel ekler, sıfat ekleri

**1 Introduction**

Russian is traditionally viewed as a comparatively challenging language to learn, particularly regarding its verbal and nominal domains. The acquisition of its verbal domain, namely, telicity and boundedness, has been investigated vastly in L2 literature (Mikhaylova, 2011, 2018; Nossalik, 2008, 2009; Slabakova, 2003, 2005, to mention a few). However, the acquisition of the nominal domain in adult L2 Russian has not been given due attention. This enquiry attempts to partially close the existing gap focusing on the question whether functional morphology on the wh-word and adjective agreement in split contexts are successfully acquirable.

Our enquiry is based on the premises of the generative framework, namely, its Minimalist Programme perspective (Chomsky, 1995). We assume that a grammatical category is composed of a bunch of morphosyntactic features (or just features, for short). These features are of the following types: semantic features (involving lexical meaning computation), syntactic features (responsible for sentence derivation), and morphophonological features (the externalized form manifested as an inflection). However, which features are involved and how they are mapped to be externalized as a morphological marker, vary depending on the language.

The language pair we have selected displays a telling difference in terms of which features are utilized at Logical Form (LF) and Phonetic Form (PF). While Russian exhibits rich adjectival morphology at PF, which is the assembly of the uninterpretable *phi*-features [*ucase*], [*ugender*], and [*unumber*], Turkish is void of any functional morphology on the adjective used attributively. The examples in Table 1 below demonstrate (non-)externalization of features in Russian and Turkish adjective-noun strings.

Table 1. Feature externalization in Russian and Turkish adjective-noun strings

|                | Adjective  | Noun  |
|----------------|--|---|
| <b>Russian</b> | <i>dorog-<b>a</b></i><br>expensive-F.NOM.SG<br>'expensive' | <i>knig-<b>a</b></i><br>book-F.NOM.SG<br>'book'           |
|                | <i>dorog-<b>u</b></i><br>expensive-F.ACC.SG<br>'expensive' | <i>knig-<b>u</b></i><br>book-F.ACC.SG<br>'book' (object)  |
|                | <i>dorog-<b>ie</b></i><br>expensive-NOM.PL<br>'expensive'  | <i>knig-<b>i</b></i><br>book-NOM.PL<br>'books'            |
|                | <i>dorog-<b>ix</b></i><br>expensive-GEN.PL<br>'expensive'  | <i>knig-<b>Ø</b></i><br>book-GEN.PL<br>'of books'         |
| <b>Turkish</b> | <i>pahalı</i><br>'expensive'                               | <i>kitab-<b>Ø-Ø</b></i><br>book-SG.NOM<br>'book'          |
|                | <i>pahalı</i><br>'expensive'                               | <i>kitab-<b>Ø-ı</b></i><br>book-SG.ACC<br>'book' (object) |
|                | <i>pahalı</i><br>'expensive'                               | <i>kitab-<b>lar-Ø</b></i><br>book-PL.NOM<br>'books'       |
|                | <i>pahalı</i><br>'expensive'                               | <i>kitab-<b>lar-ın</b></i><br>book-PL-GEN<br>'of books'   |

Note: The functional morphology is marked in bold.

In Russian, a highly inflecting language, features are assembled as a single bound morpheme (Bailyn, 2012, p. ix), whereas in Turkish, an agglutinating language (Göksel and Kerslake, 2005, p. xiv), each bound morpheme is usually assigned a specific grammatical meaning. As mentioned above, Russian adjectives agree with the corresponding noun: the adjective is specified for the uninterpretable features (namely, gender, number, and case), which must be checked and deleted in the process of derivation at Logical Form to satisfy the grammaticality condition (Adger, 2003, p. 66). In contrast, in Turkish the adjective is not specified for the respective uninterpretable features that must be expressed overtly.

The language pair we have selected displays a telling difference in terms of which features are utilized at Logical Form (LF) and Phonetic Form (PF). Whereas Russian exhibits rich adjectival morphology at PF, which is the assembly of the uninterpretable *phi*-features [*ucase*], [*ugender*], and [*unumber*], Turkish is void of any functional morphology on the adjective used attributively. The examples in Table 1 below demonstrate (non-)externalization of features in Russian and Turkish adjective-noun strings.

Another domain that our enquiry is focused on is whether the operation of NP splitting is acquirable. Normally an attributive adjective precedes the noun in Russian but particularly in spoken speech NPs are sometimes split due to discourse-related reasons (Pereltsvaig, 2008). As can be seen in example 1 below, a split NP is an adjective-noun string, where the adjective and the noun are discontinued from each other by other words in a sentence (Franks, 2007):

- (1) – *Gorjačij budeš čaj?* – *Gorjačego seyčas ne xoču čaja.*  
hot you.will tea hot now NEG I.want tea  
 ‘– Will you drink hot tea? – As for hot tea, I don’t want to have it now.’ (the underlined nominal phrase is split).

We adopt Pereltsvaig’s (2008) view on the conditions that allow splitting of NPs. She contends that scrambling, noun-ellipsis (N-ellipsis), and overt morphology on both elements of the noun phrase comprise the conditions for splitting. Whereas they all are operable in Russian, the absence of overt adjectival morphology in Turkish does not permit splitting NPs. In line with Pereltsvaig (2008), we regard NP splitting to be derived through Copy movement and partial interpretation of copies at Phonetic Form (Fanselow and Čavar, 2002; Pereltsvaig, 2008).

It is assumed that Russian wh-questions are formed via English-type overt movement, since even in subordinated constructions the wh-element is bound to move up, and no other option is attested to be grammatical (Bailyn, 2012). The wh-word does not occur in the left periphery of matrix clauses only if another constituent is topicalized or in case of echo-questions. Conversely, in Turkish the wh-element occupies the base-derived position in a matrix clause or in an embedded clause (Kornfilt, 1997). Hence, we regard Turkish wh-questions as derived in-situ.

As can be seen, our enquiry focuses on the acquisition of uninterpretable L2 features absent from the learner’s L1. Current SLA hypotheses attempt to explain which domains of L2 grammars are more or less challenging and propose divergent predictions with a view to acquirability of adjectival morphology and the operation of splitting by learners, whose L1 fails to exhibit the respective features.

For instance, the Interpretability Hypothesis (IH) suggests that uninterpretable formal features undergo Critical Period constraints; as a result, adult L2 speakers may not acquire uninterpretable formal features that are not instantiated in the L1 grammar (Tsimpli and Mastropavlou, 2007, p. 144). Based on this, the respective L2 features are expected to remain permanently misrepresented (Tsimpli and Mastropavlou, 2007, p. 155). Similar claims are also present in Hawkins (2005), Hawkins and Hattori (2006), Tsimpli and Dimitrakopoulou (2007).

The Bottleneck Hypothesis (Slabakova, 2008, 2014) approaches the process of L2 acquisition as the internalization of three distinct types of knowledge, referred to as reflexes, namely, semantic, syntactic, and morphological ones. Syntactic and semantic knowledge is perceived as constituting universal computations that “come for free” and is internalized immediately upon the acquisition of inflectional morphology. In other words, the morphological reflex, surfaced as an inflection, is viewed as the bottleneck of L2 acquisition. When the L2 learner lexically learns the functional morphology, which is the externalization of features at PF, the grammatical category is predicted to be fully acquired. In the Bottleneck Hypothesis Updated (2019) Slabakova specifically identifies four types of parameters related to the degree of challenge in SLA. Adjectival morphology in L2 Russian is regarded as “a microparameter with complicated L1-L2 mapping” (p.16), which is at the top level of difficulty. Overall, the BH predicts successful acquisition of adjectival morphology at higher proficiency levels and the syntactic operation of splitting at lower levels. Slabakova suggests acquisition is successful if semantic interpretation is 80% correct (2003, p. 285).

In contrast, the IH predicts that Russian adjectival morphology and the syntactic operation of splitting cannot be acquired since they are absent from the learners’ L1 grammar. Our enquiry is designed to test these contrastive hypotheses.

### *1.1. Literature Review*

To the best of our knowledge, there has been no research on the acquisition of adjective morphology on the wh-word and agreement in split d-linked wh-questions in L2 Russian. However, regarding other domains of L2 Russian, previous research suggests that even domains traditionally viewed as insurmountably challenging, can still be successfully acquired. For example, L2 Russian telicity is reported to be accomplished in a native-like manner in Slabakova (2003). Nossalik (2008, 2009) claims that advanced learners demonstrate native-like performance on the category of Russian outer aspect (boundedness). Mikhaylova (2011, 2018) contends that Russian aspectual morphology may pose a serious challenge for advanced learners being the “bottleneck”; she implies that L2 learners experience more difficulty with the

morphological marker rather than the syntactic operation, which is in line with the predictions of the BH. Regarding the production of case and aspectual morphology, Isurin and Ivanova-Sullivan (2008) suggest that both can be successfully acquired. In relation to the acquisition of the nominal domain in L2 Spanish by L1 English learners, de Garavito and Otolora (2016) and de Garavito (2018) report that gender and number agreement under nominal ellipsis is attained successfully, the probable difficulties are explained by the mapping between the abstract category and the particular form, as well as the resulting interface.

In contrast, Tsimpli and Mastropavlou (2007) claim that the Greek definite article may not be acquired by adult learners, whose L1 is void of the respective uninterpretable features. Instead, L2 learners are argued to employ interpretable features to repair the comprehension. A similar outcome is reported in Tsimpli and Dimitrakopoulou (2007) in relation to resumptive strategies regarding *wh*-subject and object extraction: L1 Greek / L2 English advanced learners display strong L1 effects. The same view is argued for in Hawkins (2005) in relation to the uninterpretable [*wh*] feature in interlanguage grammars, and in Hawkins and Hattori (2006) regarding how L1 Japanese learners interpret L2 English multiple *wh*-questions. A study by Al-Thubaiti (2007) also reported strong L1 effects in the acquisition of the gap strategy in L2 English *wh*-interrogatives by advanced adult L1 Arabic learners. Cherepovskaia and Slioussar (2018) investigated production errors in the Russian nominal paradigm based on a pool of written texts. Their finding suggests that even advanced learners produce errors in up to 23% of contexts (Dative case), which serves as evidence that the Russian case system is a serious challenge for L2 learners. Hence, there is literature, where certain domains of grammar are reported to be unacquirable even at advanced levels of proficiency.

Leal Méndez and Slabakova (2014) replicated the study conducted by Tsimpli and Dimitrakopoulou (2007) to test L2 English resumptive strategies regarding object extraction in adult L1 Spanish participants. Within this scope, Leal et al (2016) conducted another study with a similar research instrument, tackling interrogatives in L2 English by L1 Kuwaiti Arabic speakers. The findings in both studies suggest that the L2 populations performed on par with the control group, which casts doubt on the IH claim that these categories cannot be acquired. In addition, interpretable features (animacy, *d*-linking) were not observed to produce any aiding effect for L2 English learners.

To recap, some previous research claims L2 uninterpretable features can be successfully acquired by adult learners, whose L1 fails to display the respective features, supporting the predictions of the BH. On the contrary, other research corroborates the tenets of the Interpretability Hypothesis in that uninterpretable features are critical-age constrained and cannot be acquired by adult L2 learners. We aim to test the claims of the competing hypotheses via the participants'

performance on the Semantic Entailments task, where they are tested on their ability to correctly interpret the uninterpretable features [*ucase*], [*ugender*], and [*umnumber*] realized as an inflection of the wh-word in split d-linked wh-questions. We were careful to design the research instrument in order for interpretable features to be of no avail in aiding the participant with regard to arriving at the correct interpretation of the experimental stimuli.

### 1.2. Research Questions

With a view to test the predictions of the BH and the IH, the following research question has been posed:

*Are L2 Russian speakers at higher levels of proficiency as successful as L1 Russian speakers in comprehending split d-linked wh-questions in Russian? The above is demonstrable through the correct comprehension of adjectival morphology (specified for gender, number, and case) on the wh-word and the correct agreement with the respective split NP (object concord with the noun).*

In our instrument, the participants have to employ the adjective morphology on the wh-word being the only grammatical cue for them to arrive at the correct interpretation of the split d-linked wh-question in order to co-reference the wh-word with the Goal (short-distance split) or the Theme (long-distance split).

The Bottleneck Hypothesis predicts that L1 Turkish / L2 Russian learners may successfully acquire uninterpretable features and comprehend L2 Russian split d-linked wh-questions, based on similar evidence and as attained in Slabakova (2008) and Mikhaylova (2011). As has been shown in our previous pilot studies, L2 Russian learners may converge with L1 Russian speakers in syntactic reflexes, which is also claimed in Nossalik (2009) and Dintrans (2011). According to the results in Dintrans (2011) regarding uninterpretable features in a L2, the prediction is that as L2 learners reach higher proficiency levels, their performance on adjectival morphology (the morphological reflex) is likely to converge with that of L1 controls'. According to the latest state of the BH, the investigated category constitutes "a microparameter with complicated L1-L2 mapping" (Slabakova, 2019, p. 16), and poses the utmost challenge for the L2 population due to the uninterpretable features externalized as functional morphology, which is challenging to be learned lexically. To recapitulate, based on the BH, the L2 participants are expected to successfully acquire the morphological reflex at higher levels of L2 proficiency.

Should the obtained results demonstrate that the performance of the L2 learners at higher levels of proficiency is considerably lower compared to the L1 controls', doubt may be cast on the tenets of the BH in that this category of L2 Russian is acquirable. Conversely, this outcome may support the claims of the Interpretability Hypothesis (IH). The IH predicts that features absent from the learners' L1 cannot be internalized following the Critical Age. The evidence to the claims of the above mentioned approach is presented in Al-Thubaiti (2007),

Hawkins (2005), Hawkins and Hattori (2006), Tsimpli and Dimitrakopoulou (2007), Tsimpli and Mastropavlou (2007), among others.

## 2 Method

In our enquiry we utilized a Semantic Entailments task in order to test the participants' ability to correctly interpret the uninterpretable *phi*-features [*ucase*], [*ugender*], and [*unumber*] realized as an inflection on the *wh*-word in split *d*-linked *wh*-questions, which is the only cue for them to select a felicitous entailment (out of two options).

As our study recruited human subjects, the participants' consent was required prior to participating in parts of the study. Apart from that, the study was approved by the Istanbul Aydın University Ethics Committee (Reference number: 2022/06 of 07.04.2022).

### 2.1. Participants

In order to test the BH and the IH two groups were recruited: the native Russian control group and the L2 Russian experimental group.

The L2 Russian experimental group was recruited using social media platforms, the portal [www.ZdesVse.com](http://www.ZdesVse.com) for Russian speakers in Turkey as well as the author's friends and contacts. Additionally, Russian language programmes at universities and language courses in Turkey were contacted in order to invite L2 Russian volunteers to participate in the current study. Following a self-paced Cloze test employed by Slabakova (2005), who has kindly shared it for the current study, 23 subjects at levels B2 and over (ranges 27-31, mean=28.30) were selected. The L1 of all the participants is Turkish, and they have all acquired the Russian language in an academic environment, either in Turkey or in a country where Russian is spoken as a major community language (the Former Soviet Union countries). In order to eliminate the age of first exposure as a probable effect, we recruited only those participants who started acquiring L2 Russian following the Critical age for L1 acquisition. The group consisted of eleven female subjects (age range 22-46 y.o., average age=28.7) and twelve male subjects (age range 22-61 y.o., average age=35).

The control group consisted of 56 native speakers of Russian, who currently reside in the Russian Federation, the Republic of Belarus, or in Turkey but were born and raised in countries which Russian is spoken as a vast community language (the Russian Federation, the Republic of Belarus, Ukraine, Kazakhstan, Kyrgyzstan, Azerbaijan, etc.). It is important to note that the entire L1 Russian milieu had been exposed to Russian since childhood and had acquired it in a naturalistic setting, which was elicited in the background questionnaire. Six male



subjects (age range 20-22 y.o., average age=20.9) and fifty female subjects (age range 19-52 y.o., average age=33) constituted the control group.

## *2.2 Instrument*

The following tasks were used in our enquiry as the research instrument:

1. An online self-paced language background questionnaire to obtain data about the participants' linguistic and cultural profile;
2. An online self-paced cloze test to obtain a separate measure of proficiency in Russian (only for the L2 Russian speakers);
3. An online self-paced Semantic Entailments task designed to obtain experimental data to answer the research question.

The instructions for all the tasks were presented in Russian. The respondents were explicitly instructed to complete the tasks individually and without any assistance. The participants were informed that they could discontinue the participation at any time.

## *2.3 Semantic Entailments Task*

The semantic entailments task used as the main research instrument in our study is a partial reconstruction of the semantic entailments task employed in Mikhaylova's (2018) study. It is a comprehension task designed specifically to address the issue whether the L2 Russian population correctly comprehend the stimulus (a split d-linked wh-question) and correctly select the felicitous entailment. The d-linked wh-questions are supplied with a context (a short discourse situation) to facilitate the participants' comprehension and parsing, as suggested in Leal Méndez and Slabakova (2014). For each item subjects could choose either one of two probable entailments, or both. However, only one entailment was felicitous. The possibility to select both options was activated for a twofold reason: on the one hand, both options were plausible for some of the filler items; on the other hand, we were curious regarding optionality and indeterminacy in L2 responses, which could imply that the syntactic reflex is not fully acquired.

Utmost effort has been made to design an instrument with a view to eliminate all collateral effects, such as discourse, d-linking, animacy, noun-gender assignment issues, etc. Hence, the inflection on the wh-word is the only cue for the participants to arrive at the correct interpretation of the d-linked wh-question in order to select the felicitous entailment, namely, the response to the question.

All the experimental items in our research instrument have an identical surface structure: it is a split d-linked wh-question with a 3-predicate verb, such as 'send, give, show, pass', and the like. The initial left-peripheral position is occupied by the wh-word, which undergoes overt wh-movement. The agent follows the wh-word and is instantiated by the pronoun *ty* 'you-NOM.SG'; the

two remaining arguments are linearized in the following order: Goal, expressed by an animate dative noun (gender is manipulated); Theme, expressed by an inanimate accusative noun (gender is manipulated). The verb follows the Goal and precedes the Theme. Hence, the right-peripheral position is occupied by the Theme. Below is an example of an experimental item as presented to a participant:

Lately I have had a lot of work to do, and I had to give part of it to one of our co-workers. Now he is dealing with it [the work].

- *Kakomu ty sotrudniku peredal rabotu?*  
Which-M.DAT<sub>i</sub> you co-worker-M.DAT<sub>i</sub> pass work-F.ACC  
'Which co-worker did you pass the work?'
- A. The co-worker who is in the office across. (CORRECT)
- B. The work related with the latest project. (INCORRECT)

Based on the information above, we have decided to manipulate the following factors in order to obtain the necessary test conditions:

**1. The gender of the Goal expressed by a Dative noun:** masculine vs. feminine. In all experimental items the Dative noun is specified for [+animacy] and is manifested by a noun denoting a human being with the thematic role of a Goal, hence, the gender of the noun is lexical rather than grammatical.

**2. The gender of the Theme expressed by an Accusative noun:** masculine vs. feminine. In all experimental items Accusative nouns are specified for [uanimacy] and denote inanimate objects, hence, possess grammatical gender.

**3. The Dative object concord vs. Accusative object concord as externalized by the overt inflection on the wh-word:** *-omu* for masculine dative concord and *-oj* for feminine dative concord; *-oj* for masculine accusative concord and *-uju* for feminine accusative concord, respectively. Thus, the adjective-noun agreement is attained via the co-reference of the inflection on the wh-word and the respective restrictor. Note that the concord and the distance of the split are always correlated: the Dative concord is represented by the short-distance split whereas the long-distance split accounts for the Accusative concord.

### 2.3.1 Conditions

Through the manipulation of the factors above, eight conditions were formed. However, two conditions, being globally ambiguous, were disregarded as the previous pilot study demonstrated that even L1 participants experience considerable difficulty while selecting the entailment. The obtained conditions are as follows (note: since all the arguments are singular, this information is omitted from the glosses):

#### 1. Gender Mismatch Short (Condition 1)

*Kak-omu<sub>i</sub> ty drug-u<sub>i</sub> dal knig-u?* (Gender Mismatch Short)

Which-M.DAT you friend-M.DAT gave book-F.ACC

‘Which friend did you give the book?’

- a. I gave it to Andrey. (felicitous)
- b. It is a book about adventures. (incorrect)

2. Gender Mismatch Long (Condition 2)

*Kak-**ujuj** ty drug-**u** dal knig-**uj**?* (Gender Mismatch Long)

Which-F.ACC you friend-M.DAT gave book-F.ACC

‘Which book did you give to the friend?’

- a. I gave it to Andrey. (incorrect)
- b. It is a book about adventures. (felicitous)

3. Masculine Short (Condition 3)

*Kak-**omu**i ty drug-**u**i dal podarok-**Ø**?* (Masculine Short)

Which-M.DAT you friend-M.DAT gave gift-M.ACC

‘Which friend did you give the gift?’

- a. I gave it to Andrey. (felicitous)
- b. It is a book about adventures. (incorrect)

4. Masculine Long (Condition 4)

*Kak-**ojj** ty drug-**u** dal podarok-**Øj**?* (Masculine Long)

Which-M.ACC you friend-M.DAT gave gift-M.ACC

‘Which gift did you give to the friend?’

- a. I gave it to Andrey. (incorrect)
- b. It is a book about adventures. (felicitous)

5. Feminine Short (Condition 5)

*Kak-**oji** ty podrug-**e**i dal knig-**u**?* (Feminine Short)

Which-F.DAT you (girl)friend-F.DAT gave book-F.ACC

‘Which (girl)friend did you give the book?’

- a. I gave it to Anna. (felicitous)
- b. It is a book about adventures. (incorrect)

6. Feminine Long (Condition 6)

*Kak-**ujuj** ty podrug-**e** dal knig-**uj**?* (Feminine Long)

Which-F.ACC you (girl)friend-F.DAT gave book-F.ACC

‘Which book did you give to the (girl)friend?’

- a. I gave it to Anna. (incorrect)
- b. It is a book about adventures. (felicitous)

Table 2 below demonstrates the composition of the Instrument and the manipulated factors. Each condition is represented by six tokens.

### 2.3.2 Procedure

The instrument was administered to the L2 Russian subjects online in two separate sessions; the L1 Russian speakers had only one session. The sessions were self-paced. The participants accessed the sessions using an Internet link, which was present on several social media platforms, or shared by the author

individually. The first session included the consent form, the background questionnaire, and the Semantic Entailments task. The second session comprised a L2 Proficiency test. As mentioned above, it was performed only by the L2 Russian population using a separate link. The L2 subjects were individually sent the Internet link after completing the first session. All parts of the research instrument were designed using Google Forms. The collection of data was conducted between 12.2019 and 05.2021.

Table 2 below visually presents information on the number of tokens and type of research instrument items used in the Semantic Entailments task.

Table 2. Items of the research instrument by condition and type

| Research Instrument Items     |                                     |  |                                   |                |                    |                |                 | Number of tokens |
|-------------------------------|-------------------------------------|--|-----------------------------------|----------------|--------------------|----------------|-----------------|------------------|
| Fillers                       | Type I                              | both entailments correct                               |                                   |                |                    |                |                 | 10               |
|                               | Type II                             | elementary structures with a single correct entailment |                                   |                |                    |                |                 | 11               |
| Experimental Items            | Condition                           | Wh-word inflection                                     | Wh-word inflection specified for: | Type of Split  | Co-reference with: | Gender of Goal | Gender of Theme |                  |
|                               | Gender Mismatch Short (Condition 1) | -omu   | M.DAT                             | short-distance | Goal               | M              | F               | 6                |
|                               | Gender Mismatch Long (Condition 2)  | -uju   | F.ACC                             | long-distance  | Theme              | M              | F               | 6                |
|                               | Masculine Short (Condition 3)       | -omu   | M.DAT                             | short-distance | Goal               | M              | M               | 6                |
|                               | Masculine Long (Condition 4)        | -oj  | M.ACC                             | long-distance  | Theme              | M              | M               | 6                |
|                               | Feminine Short (Condition 5)        | -oj  | F.DAT                             | short-distance | Goal               | F              | F               | 6                |
|                               | Feminine Long (Condition 6)         | -uju   | F.ACC                             | long-distance  | Theme              | F              | F               | 6                |
| <b>Total number of tokens</b> |                                     |  |                                   |                |                    |                |                 | 57               |

### 3 Results

In order to attest statistical significance between the groups and conditions, accuracy across the participant groups and the experimental conditions was calculated using R software (version 4.1.0., R Core Team, 2021). Since the obtained data were not normally distributed and binary and nonparametric tests were utilized. Specifically, the Kruskal-Wallis test, the Dunn's test, and the Mann-Whitney U test were conducted.

Table 3 below demonstrates accuracy percentages of L1 Russian and L2 Russian groups on six conditions in the Semantic Entailments task.

*Table 3. Accuracy on six experimental conditions by L1 and L2 Russian groups*

| <b>CONDITION</b>                              | <b>L1 GROUP (%)</b> | <b>L2 GROUP (%)</b> |
|---|---------------------|---------------------|
| <b>Gender Mismatch Short</b><br>(Condition 1) | 97.9%               | 94.9%               |
| <b>Gender Mismatch Long</b><br>(Condition 2)  | 97.9%               | 85.4%               |
| <b>Masculine Short</b><br>(Condition 3)       | 99.7%               | 94.9%               |
| <b>Masculine Long</b><br>(Condition 4)        | 98.2%               | 82.5%               |
| <b>Feminine Short</b><br>(Condition 5)        | 97.9%               | 94.2%               |
| <b>Feminine Long</b><br>(Condition 6)         | 97%                 | 84.8%               |

As can be seen, the performance of the L1 group is over the top on all conditions, ranging from 97% to 99.7%. Regarding the L2 group, the accuracy is slightly lower on all the conditions, ranging from 82.5% to 94.9%. Specifically, the L2 Russian group's performance is more successful on the short-distance conditions: gender mismatch, masculine, and feminine, and ranges from 94.2% to 94.9%. On the respective long-distance conditions the L2 group performed slightly lower, accuracy ranging between 82.5% and 85.4%. Nevertheless, the performance on all the conditions is above the threshold of successful acquisition as proposed by Slabakova (2003).

To understand whether the difference between L1 and L2 Russian groups in accuracy was statistically significant, we conducted a Kruskal-Wallis test. Note that in the original study four group comparisons were present, namely A2, B1, B2-C2, and L1. When Kruskal-Wallis test results proved significant ( $p < 0.05$ ), a post-hoc Dunn's test was run for a pairwise analysis. Table 4 below demonstrates the results obtained in these two tests. For the pairwise analysis only L1 and high intermediate through advanced L2 proficiency group comparisons are presented by virtue of convenience; in relation to our study the B2-C2 group stands for the L2 population. The raw data are not presented due to space constraints and are available on request.

Table 4. Results of a Kruskal-Wallis test (L1 Russian vs. L2 Russian proficiency groups) and post-hoc Dunn's test (L1 Russian vs. B2-C2 Russian) on six experimental conditions

| Condition tested             | Test name           | H value (K-W Test) | Z value (D Test) | Groups compared      | Degrees of freedom | p-value |
|------------------------------|---------------------|--------------------|------------------|----------------------|--------------------|---------|
| <b>All conditions</b>        | Kruskal-Wallis Test | 63.7               |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -2.04            | L1 vs. B2-C2         |                    | 0.25    |
| <b>Gender Mismatch Short</b> | Kruskal-Wallis Test | 30.74              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -0.84            | L1 vs. B2-C2         |                    | 1       |
| <b>Gender Mismatch Long</b>  | Kruskal-Wallis Test | 30.74              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -0.84            | L1 vs. B2-C2         |                    | 0.24    |
| <b>Masculine Short</b>       | Kruskal-Wallis Test | 38.99              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -1.22            | L1 vs. B2-C2         |                    | 1       |
| <b>Masculine Long</b>        | Kruskal-Wallis Test | 58.54              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -2.31            | L1 vs. B2-C2         |                    | 0.13    |
| <b>Feminine Short</b>        | Kruskal-Wallis Test | 42.65              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -1.02            | L1 vs. B2-C2         |                    | 1       |
| <b>Feminine Long</b>         | Kruskal-Wallis Test | 53.93              |                  | A2 – B1 – B2-C2 – L1 | 3                  | <0.01   |
|                              | Dunn's Test         |                    | -1.54            | L1 vs. B2-C2         |                    | 0.75    |

As can be seen in Table 4, the Kruskal-Wallis test results proved significant throughout, and a post-hoc Dunn's test was run for the six conditions. Since multiple comparisons were made, the probability of finding a significant difference by chance increases. P-value adjustment methods, such as the Bonferroni correction, control this situation by increasing the threshold for significance; therefore, a difference is less likely to be declared significant should it be due to chance. To this end, the Bonferroni method was implemented for p-value adjustment. The resulting p-values on all conditions suggest that there is no statistical difference between the L1 and L2 populations.

To provide further evidence regarding the statistical significance of the difference between the groups, we conducted a Mann-Whitney U test to understand whether the groups' performance on short-distance conditions versus

long-distance conditions was statistically significant. Table 5 below demonstrates the results of a comparison on three short-distance conditions versus three long-distance conditions by L1 and L2 groups.

*Table 5. Results of a Mann-Whitney U test comparing performance on short-distance vs. long-distance conditions by L1 and L2 groups*

| Comparison                       | Group tested | Statistic<br>(U value) | p-value |
|----------------------------------|--------------|------------------------|---------|
| Short-distance vs. Long-distance | L1           | 1599                   | 0.50    |
|                                  | L2           | 321                    | 0.18    |

The results of the Mann-Whitney U test in Table 5 are in line with the information presented in Table 4. Specifically, no statistically significant difference has been attested between how each participant group approaches short-distance and long-distance conditions.

Overall, the results obtained after conducting the tests above imply that the difference between the L1 and L2 Russian groups' performance on each of the six conditions is not statistically significant.

#### 4 Discussion

Our research question addressed potential differences in the comprehension of split d-linked wh-questions by L1 and high intermediate through advanced L2 populations. The difference is demonstrable through the correct comprehension of adjectival morphology (specified for case, gender, and number) on the wh-word and the correct assignment of the wh-word on the appropriate object (Dative or Accusative), which is split from its headword. Assuming that 80% of correct interpretation constitutes successful acquisition of a grammatical category (Slabakova, 2003), based on the obtained results we can argue that the L2 group has successfully acquired adjective morphology, which is the externalization of uninterpretable *phi*-features on the wh-word in a split context, as well as adjective-noun agreement.

L1 Russian speaker data revealed a homogeneous over-the-top accuracy on all experimental conditions regardless the distance type of the NP split or the inflection on the wh-word (over 97%). As we compare the L2 Russian milieu and the L1 controls, we see that the results clearly suggest that uninterpretable features externalized as an inflection on the wh-word and adjective agreement

are acquired successfully (82.5-94.9% accuracy). The accuracy thereof is statistically indistinguishable from the L1 group ( $p=.25$  for all conditions, L1 and L2 compared in Table 4), which is in line with the results in Slabakova (2003) and Nossalik (2008, 2009) with regard to the acquisition of L2 Russian telicity and the outer aspect, respectively. Our findings clearly shows that L2 uninterpretable features realized as functional morphology and absent from the learners' L1 can be successfully acquired at higher levels of proficiency, which refutes the provisions of the IH and supports the BH. Hence, we can argue that split d-linked wh-questions are fully acquirable in L2 Russian. Recall that the inflection on the wh-word is the only cue to arrive at the correct interpretation of the wh-question; no interpretable feature can aid the participant in selecting the felicitous entailment. Based on this, our outcome is contrary to the result in Laleko (2019), where advanced heritage speakers were compared to L2 learners and a difference was attested between monolingual speakers and the L2 group regarding how the two associated verbal aspectual marking and some properties of verbal internal arguments.

Attesting the 80% threshold as the measure for a successfully attained grammatical category, we can observe that L2 participants at higher levels of attainment may converge with the L1 group regarding accuracy on short-distance splits (accuracy on separate conditions ranges from 94.2 to 94.9%). This clearly indicates that the uninterpretable feature [*u*case: Dative] reassembled with [*u*gender: Masculine or Feminine], and [*u*number: Singular] does not pose an insurmountable challenge for L2 learners, also reported in Artoni and Magnani (2015). Similar results were obtained in Isurin and Ivanova-Sullivan, 2008; Nossalik, 2008, 2009; Slabakova, 2003. Leal et al (2016) and Leal Méndez and Slabakova (2014) also reported successful acquisition of uninterpretable features absent from the L2 learners' L1, which evidently confirms the predictions of the BH in that features absent from the learner's L1 can be accessed and acquired. This refutes the claims of the IH in that uninterpretable features are Critical age-constrained, results reported in Al-Thubaiti (2007), Hawkins (2005), Hawkins and Hattori (2006), Tsimpli and Dimitrakopoulou (2007), Tsimpli and Mastropavlou (2007), among others. Specifically, our finding may cast doubt on the claim in Cherepovskaia and Slioussar (2018) that the Russian case system poses a serious challenge to the L2 population, where Dative was reported to be incorrectly used in 23% of contexts by advanced L2 Russian learners (a production task). Our results confirm the predictions of the BH in that the challenge is primarily contained in the morphological reflex, i.e. the inflection itself, rather than the syntactic or semantic reflexes, which may be fully internalized. Similar outcomes are presented in de Garavito and Otalora (2016) in relation to the acquisition of gender and number agreement under nominal ellipsis in L2 Spanish as well as in Isurin and Ivanova-Sullivan (2008) regarding both aspectual and case morphology in L2 Russian.



Together with that, it is worth reporting that the experimental conditions in which L2 subjects were tested on assigning the wh-word inflection on the Accusative noun demonstrated considerably lower accuracy compared to assigning the wh-word on the Dative noun. The Accusative inflection on the adjective is supposed to be internalized prior to the Dative one (Andrjushina et al, 2009; Nahabina et al, 2001). This fact also finds evidence in the previous research on the acquisition of L2 Russian cases, for instance, Artoni and Magnani (2015), Cherepovskaia and Slioussar (2018). Recall that the co-reference of the wh-word with the Accusative object is correlated with long-distance splits. It seems that primarily the challenge is comprised not by the uninterpretable feature [*u*case: Accusative] or the associated morphology per se, as much as by the distance between the antecedent (the wh-word) and the restrictor, which was reported in the previous research. For instance, Lichtman (2009) claims that longer distance effect increases processability costs (Pienemann, 1998) as observed with regard to agreement in beginners and intermediate subjects. Since no high intermediate or advanced group was recruited in Lichtman's enquiry, our study effectively closes that gap. Our finding evidently suggests that the L1 group and the L2 milieu at higher proficiency levels are statistically indistinguishable in terms of comprehending uninterpretable features on the wh-word, which is in line with Lichtman's (2009) outcome. These results are against the predictions of the IH in that L2 learners may be significantly different from the L1 population regarding agreement, and conversely, the BH predictions are confirmed. Processing of long-distance splits is incrementally more effective as L2 learners advance and tackling the issue in the processability framework may yield interesting results.

## 5 Conclusion

The results of the analysis, both regarding the groups and the experimental conditions, suggest that split d-linked wh-questions can be successfully acquired by L2 Russian learners, which supports the predictions of the Bottleneck Hypothesis. In this respect it is important to reiterate that the functional morphology externalized as an inflection on the wh-word through checking and deleting the uninterpretable *phi*-features [*u*case], [*u*gender], and [*u*number] does not pose an insurmountable challenge for the L2 Russian learners, whose L1 does not possess the respective features either at LF or PF. This finding refutes the tenets put forward by the IH, namely, that uninterpretable features are developmentally constrained and cannot be acquired following the Critical Age. The diminished accuracy on long-distance conditions can be accounted for the increased processability load.

Since the current enquiry was conducted with a self-paced design of the research instrument, no comprehensive data have been obtained regarding the

processability load experienced by the participants. Approaching the acquisition of adjective morphology on the *wh*-word in split contexts from the processability framework could yield interesting results. Additionally, the processability issues of globally ambiguous conditions, which were disregarded from the current study, can also be tackled in further research. Our enquiry employed only transparent inflections that are discerned fairly easily, for this reason a replication of the current enquiry with opaque morphology may provide additional evidence. A limitation of our study has been the focus on the interpretation but not the production of split *d*-linked *wh*-questions by L2 Russian learners. In this respect, it might be useful to conduct further research on split nominal phrases, which would also include production or grammaticality judgment tasks.

**Author Contributions:** This study as a part of PhD study was conducted by two authors. The first author (Dzmitry Kulsha, who was the PhD student) focused on the literature review, details related to the Russian language (Linguistic Background), methodology, the results, discussion, and the conclusion sections. The second author (Dr. Filiz Çele) provided assistance (as the supervisor of the PhD study from which this article was prepared) in relation to the Turkish language (Linguistic Background), methodology, research questions, theoretical background, and contributed with advice in the results, discussion, and the conclusion sections.

**Submission statement and verification:** This study has not been previously published elsewhere. It is not under review in another journal. Publication of the study has been approved, either implicitly or explicitly, by all authors and the responsible authorities at the university/research center where the study was conducted. If the study is accepted for publication, it will not be published in the same form in another printed or electronic medium in Turkish or any other language without the written permission of the Journal of Linguistic Research.

**Conflict of Interest Statement:** The authors declare that there are no financial or academic conflicts of interest between themselves or with other institutions, organizations or individuals that may affect this study.

**Data Use:** In this study data was collected by the authors: a background questionnaire, a proficiency measure test, and a semantic entailment test were administered to L1 Russian and L1 Turkish / L2 Russian speakers. The collection process was implemented based on the ethical principles. The subjects could discontinue the participation any time.

**Ethical Approval/Participant Consent:** İstanbul Aydın University Ethics Committee approval dated 03.08.2022 and numbered E-88083623-020-58192 was obtained from the Ethics Committee. Participants were informed about the research and informed consent was obtained from the participants.

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