FROM INTRUSIVE TO RESUMPTIVE

THE ACQUISITION OF WH-DEPENDENCIES BY BEHDINI LEARNERS OF ENGLISH

By

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I confirm that the work submitted is my own and that appropriate credit has been given where reference has been made to the work of others.

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ABSTRACT

The acquisition and development of syntax in L2 learners has been one of the most interesting topics for psycholinguists. The interest arises from the desire to understand how language structure is processed in the minds of the learners and whether this processing is language specific or universal irrespective of the linguistic background of the learners.

This dissertation consists of two studies. The first one is a native speaker Judgement Elicitation Task (JET), to ascertain the nature of resumptive pronouns in Behdini and English. 30 Behdini native speakers from Iraqi Kurdistan and 24 English native speakers from the UK and the USA took part in it. It was shown that Behdini features true resumption, but RPs are not truly optional, and they are less marked than in English and subject to complex variability patterns, which appear to be associated with the interaction of split ergativity and the higher subject restriction. The only non-variable case is possessive structures, which show categorical requirement for RPs.

English was confirmed to feature intrusive pronouns, which are not grammatical RPs but tend to be used in island constructions to rescue the ungrammaticality. Based on the results of this JET, predictions were designed for the second study.

The second study is a self-paced reading task (SPRT), which investigates the acquisition of a syntactic aspect of English wh-structures in Behdini Kurdish-speaking adult learners. It is an attempt to find out how Behdini learners of English learn the distribution of intrusive pronouns and gaps in English islands and wh-structures. It involved reaction time (RT) measurement, in which 34 Behdini learners of English (whose proficiency, measured by cloze test, ranged from 50% (Intermediate) to 92% (Highly Proficient) and 20 English native speakers took part. There were 36 sentences, presented once with a gap and once with a resumptive in randomised order (total: 72). Judgements were on a 4-point scale (ok - ok but difficult to understand - marked - bad).

This study assumes a number of SLA theories, including the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007), the Full Transfer Full Access Hypothesis (Schwartz & Sprouse, 1996), and the Variational Model of Language Acquisition (Slabakova, 2008). The study reports that Behdini learners acquired the correct distribution of gaps in most structures, but they over-accepted the RPs even at high proficiency levels. Therefore, RPs were transferred from L1 grammar into the L2 interlanguage. The processing part of the experiment

reports that L2ers were relying on implicit knowledge, rather than explicit knowledge, to make their judgements. Proficiency was observed to have an effect on processing ungrammatical sentences more slowly than grammatical sentences similarly to native speakers. The variational learning hypothesis captures such differences as competition between grammars, i.e. representational (albeit driven by frequency patterns in the input). More proficient learners get more target-like in structures with gaps, so the grammar that licenses them is getting reinforced. The lack of improvement in the rejection of RPs can be captured by complementing the Variational Learning Hypothesis with the Inhibition Hypothesis, which explains such pattern of over-acceptance as a processing effect.

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LIST OF ABBREVIATIONS

The abbreviations used in the study are:

1PL	First person plural
1SG	First person singular
2PL	Second person plural
2SG	Second person singular
3PL	Third person plural
3SG	Third person singular
ABS	Absolutive
ACC	Accusative
COMP	Complementizer
CON	Construct
DAT	Dative
DIR	Direct
ERG	Ergative
EZ.F	Singular feminine Ezafe particle
EZ.M	Singular masculine Ezafe particle
EZ.PL	Plural Ezafe Particle
JET	Judgement Elicitation Task
L1	First Language
L2	Second Language
LF	Logical Form
LOC	Locative
LV	Light Verb
NEG	Negative

NOM	Nominative
OBL	Oblique
PAST	Past
PROG	Progressive
PRST	Present
RP	Resumptive Pronoun
RT	Reaction Time
SLA	Second Language Acquisition
SPRT	Self-Paced Reading Task
UG	Universal Grammar
VN	Verbal Noun
VOC	Vocative

CHAPTER 1

INTRODUCTION

This thesis examines the acquisition and processing of gaps and intrusive pronouns in English by second language learners of Behdini Kurdish. For researching this topic, insights will be employed from generative approaches to second language acquisition (SLA).

In order to weigh in on current debates regarding second language acquisition and processing, the research includes two experimental studies. The first is a judgment elicitation task (JET) involving native speakers of Behdini and English, aiming to ascertain the status of resumptive pronouns in each language. The predictions for the second language acquisition study are based on the findings of this first study. The second study is a reaction-time experiment involving adult Behdini learners of English as a second language (and native speakers' control). The aim of this second study is to attempt to better understand the processing and performance of Behdini L2ers regarding their acquisition of English wh-structures in terms of differences in reaction or processing times, as well as the accuracy results.

1.1 The Research Problem

In general, the acquisition and comprehension of a second language is a hard task to achieve, especially in a country where the second language is not an official (and not) - or even a second official - language.

Comparing the Behdini wh-structures to those of English, one can observe that they differ in many respects. Behdini features apparent resumption (as in 1a, below) and makes use of resumptive pronouns (RPs) where the gap position is filled by a pronoun. In Behdini, RPs are used in NP-internal (possessive) positions obligatorily and, optionally, in the rest of structures. English, on the other hand, features intrusive pronouns as in (1b), in which the use of RPs is not grammatical, but is only used to rescue island violations. In English RPs are never used in non-island clauses.

(1) a. Ew mêz-a ku ez kitêb-a di-danim-e ser (wê).
Det desk.EZ.F Comp I book-PL PRST-put-3SG on (it)
'the desk that I put books on (it)'

b. I'd like to meet the linguist that Peter knows a psychologist that works for **her**.

Another notable difference between English and Behdini is that English is an Accusative language, whereas Behdini demonstrates accusativity and ergativity. So the way argument structures are encoded by the split ergativity in Behdini and the case markers on objects in the ergative case and on subjects in the accusative case, might have effects on RPs in Behdini. To show these differences, as mentioned above, a JET has been conducted to work out the grammar of the sentences used and to ascertain the status of resumptives in Behdini and English.

The question here is: How do Behdini-speaking learners of English learn the distribution of English intrusive pronouns and gaps? What effect will apparent resumptives in Behdini have in this process and how will Behdini speakers restrain their L1 apparent RPs? Will the process involve some systematic development?

The other question is: How would "the parser," i.e. the online language processing abilities, interact with L2ers' underlying syntactic competence (i.e. knowledge of language)? And is there a difference between their competence and performance?

To sum up the issue in this research, the study involves L2ers whose L1 features RPs who continue over-using them even though they are (quasi) absent in the target language (e.g. Tsimpli & Dimitrakopoulou, 2007). The question is whether the configurations featuring RPs in their interlanguage involve wh-movement (with last-resort insertion of an RP), as with English intrusive pronouns – (Sells, 1984; Aoun & Li, 2004), or whether they are anaphoric dependencies, as in their first language (L1) (Alexopoulou, 2010). The study aims to find out to what extent this explains their distribution and acceptance rates.

1.2 Aims of the Research

The study aims to investigate the L2 acquisition of wh-dependencies (object chains only) by Behdini adult learners of English. Behdini features ‘grammatical’ resumptive pronouns which arise in anaphoric dependencies (not derived by movement) (Alexopoulou, 2010). On the other hand, English features intrusive resumptives (Sells, 1984) as the last-resort rescue of a move operation (McCloskey, 2002). The instantiation of grammatical RPs is subject to parametric variation (McCloskey, 2006).

The study also aims to investigate the learning of English intrusive pronouns by Behdini speakers in order to arrive at the following:

1- To try to find out the route of the development of acquisition of English intrusive pronouns. To achieve that, this study involves roughly three groups of learners based on their proficiency in the English language: beginners, intermediates, and advanced learners. Therefore, proficiency will be a main factor to determine if the acquisition of intrusive pronouns by Behdini learners involves systematic development.

2- What role the mother tongue (Behdini Kurdish with apparent RPs) plays in the process of learning the wh-structures in English.

1.3 Research Questions

i. Research questions regarding the L1 study

The research questions that will guide the analysis in the first study are the following:

1. What are the types of RPs featured in Behdini and English?

2. What predicts the presence of RPs in Behdini and English, in addition to their general typological properties?

ii. Research questions regarding the SLA study

1- What is the status of resumptive pronouns in the interlanguage of Behdini learners of English? In other words, how do L2 learners go from a grammar featuring apparent resumption to one featuring intrusive resumption?

2- Can Behdini learners of English acquire wh-dependencies (in wh-questions and relative clauses)?

More detailed questions and hypotheses will lead the analysis in this study. However, they will be explained in later chapters, as there is not enough detail in this introduction to allow following all the hypotheses.

1.4 Data Collection

The data for the experimental tasks will be elicited by using a variety of techniques, including behavioural data (i.e. grammaticality judgments) and psycholinguistic data (i.e. reaction-time).

The informants that will participate in the data collection process will be students in the Faculty of Arts, School of English at the University of Duhok/Iraq and other English learners in the university. For a native English speaking group, Leeds university students, employees, and professors will be recruited.

1.5 Structure of the Thesis

The current thesis includes five chapters. The first chapter is a general introduction that shows the key points and baselines in the research. The second chapter involves an overview of Behdini morphology and syntax, focusing on a number of syntactic and morphological aspects that are relevant to this study. Chapter three contains a literature review about second language acquisition and processing, focusing on the generative approaches to SLA. The fourth chapter presents a relevant review on resumptive/intrusive pronouns represented by Behdini and English, in addition to previewing the results and statistical analyses of the native-speaker JET study. Then a set of predictions are spelled out on the basis of the JET that is conducted with native Behdini and English speakers. These predictions will then set the foundations for the SLA study. The final chapter presents the results and statistical analyses for the self-paced reading task plus the JET. This represents the L2 acquisition study for which the reaction time (RT) is being measured. The chapter will close with a set of conclusions.

CHAPTER 2

AN INTRODUCTION TO BEHDINI

Behdini is a variety of Kurdish. Behdini Kurdish is the language spoken by the Kurds predominantly in Duhok province in Iraqi Kurdistan. The Kurdish language falls within the group of Iranian languages representing a branch of the Indo-European family, thus it is related to the eastern branches of the Indo-European languages, such as Persian and Hindi, and to the western branches of the family, such as English, French, and German. Kurdish includes many Arabic and Persian words in addition to some Turkish vocabulary.

Kurdish is divided into two main dialects, which are Kurmanji and Pahlawani, from which several local dialects are branched, reaching up to 18 various dialects. Kurmanji is subdivided into Northern Kurmanji, or Behdini, and Southern Kurmanji, or Sorani. Behdini, in turn, is subdivided into Gorani and Zaza (also known as Demili). Dozens of dialects are offshoots of the last four mentioned dialects, and each prevails in a certain region, tribe, or village.

Like all Indo-European languages, other languages preceded this family. Different nations had been living in Kurdistan when the immigration of the Indo-European peoples took place in the early second millennium BC. Examples of previous nations who lived there include the Gutis, Lullus, Hurris, Kassites. Kurds in Turkey and Syria, and some Kurds in Iran and Iraq, speak Behdini, whereas the majority of Kurds in Iraq and Iran speak Sorani. Kurmanji is the largest dialect in terms of the numbers of speakers, approximately 20 millions.

Behdini is an SOV language, featuring the following notable syntactic properties: (i) split-ergativity, (ii) argument drop, (iii) the use of Ezafe, (iv) the use of light verbs, and (v) preposition stranding. I will briefly introduce each syntactic property below, after surveying relevant morphological facts.

2.1 Morphology of Behdini

2.1.1 Argument Structure

Basically, a core argument of a verb is subject, direct object, or indirect object. All natural languages distinguish between intransitive clauses (i.e. a verb and one core argument) and transitive clauses (i.e. a verb and two or more arguments). According to Dixon (1987: 2 and 1994: 6), there are three primitive syntactic relations listed in Table 2-1.

Table 2-1: Syntactic relations

S (Subject)	Subject of an intransitive verb
A (Agent)	Subject of a transitive verb
O (Object)	Object of a transitive verb

The syntactic relation S stands for the single argument of an intransitive clause (as in 2a), A represents the Agent of a transitive clause (as in 2b), and O corresponds to the object of a transitive clause (as in 2c). These core arguments are considered to be the basics upon which an essential distinction is made between the so-called accusative, ergative, and active languages (Ura, 2000: 181; Carnie, 2002: 236; Wheeler, 2003: 2; Peterson, 2005: 7).

(2) a. **She** laughed.
b. **She** moved the chair.
c. The police arrested **her**.

According to the manner in which a language marks the core arguments S, A, and O, there are two major case systems:

1- The Accusative case system (or Accusativity)

2- The Ergative case system (or Ergativity)

The accusative case system (or nominative-accusative) has a case pattern that groups S and A together, marking them with one single case known as nominative, whereas the O argument is marked differently, with accusative case (Matthews, 1997; Wheeler, 2003; Siegel, 2004; Slater, 2004; to list a few). The accusative system can be represented as follows:

Table 2-2: Accusative System

Nominative	Accusative
A S	O

Table 2-2 shows that the subject has the same morphological coding either in intransitive or transitive clauses. Many languages of the world have the accusative system of case; e.g. English, Latin, German, Japanese, Arabic, and most of the Romance languages (i.e. French, Spanish, and so on).

In English, all clauses show the accusative pattern, in which objects are accusative and verbs agree with their subjects as in 3.

(3) a. John is writing a letter.
b. They are writing a letter.

The ergative case system (or ergative-absolutive), on the other hand, has a case pattern that groups S and O together, marking them with one single case known as Absolutive, whereas the A argument is marked differently with ergative case (Crystal, 1991; Dixon, 1994; Van Valin, 2001; Slater, 2004; O'Grady, 2005; to list a few). The ergative system can be represented as follows:

Table 2-3: Ergative System

Ergative	Absolutive
A	S O

In Behdini past tense clauses, the verb agrees with intransitive subjects or direct objects (S/O). In these clauses, the 'oblique' corresponds to the Ergative, as it is used to mark transitive subjects.

2.1.2 Split-ergativity

A quarter of the world languages display Ergativity as their main case systems. Among these languages are the Caucasian, Tibeto-Burman, Australian and Indo-Arian languages (e.g. Hindi, Nepali, Gujarati, and Bengali languages). Also, some Iranian languages, like Behdini and Pashto, show ergative constructions (Blake, 1994: 122, 129).

Ergativity refers to a pattern that some languages show in treating arguments of a verb. The accusative structure treats the two types of subject the same, and marks the O differently. The ergative system (or ergative-absolutive) treats the subject of an intransitive verb (S) and the object of a transitive verb (O) similarly, marking them with one single case known as absolutive, whereas the subject of a transitive verb agent (A) is marked differently with ergative case (Dixon, 1994: 1).

The phenomenon of split ergativity is shown in several Indo-Iranian languages. Such languages demonstrate a partly ergative and partly accusative behaviour. Many so-called ergative languages are not pure, but rather split-ergative (Ura, 2006: 117).

Delancey (1980: 627) argues that split ergativity can be manifested in several ways across languages, such as, split according to the tense/aspect of the verb or split according to the person or semantic nature of the agent.

The ergative pattern operates on two levels: morphological and syntactic.

Morphological ergativity is very common among the ergative languages of the world. In ergative structures, both S and O have the absolutive case, i.e. they are unmarked; whereas the A argument is marked with the ergative case in most languages.

As far as Behdini is concerned, it features split ergativity, which is a pattern that shifts between the two case systems, ergativity and accusativity. In Behdini, this depends on tense and aspect factors (Dixon, 1994: 71). In languages like Behdini, when the verb is in the past, the case system is ergative (as in 4a); whereas, if the stem of verb is in the present, the case system is accusative (as in 4b). Split-ergativity in Behdini is manifested in Table 2-10.

(4) a. Wî ez dît-im.
he:OBL me:DIR see-PAST:1SG
'He saw me.'

b. Ew min di-bîn-ît.
he:DIR me:OBL PROGR-see-3SG
'He sees me.'

In Behdini, argument structure is encoded with verbal agreement as well as case.

In (4a), which illustrates ergativity, the agreement is between the verb *dîtim* 'saw' and the object *ez* 'me,' realized by the morpheme *im* suffixed to the verb. As for (4b), which illustrates accusative case, the agreement is between the verb *dibînît* 'see' and the subject *ew* 'he,' with agreement morphologically realized by the suffix *ît*.

2.1.3 Case Paradigms

The agreement paradigms in Behdini operate differently in both nominative and accusative patterns as well as in the case paradigms. However, the same forms are used in accusative and in ergative structures. Therefore, rather than labeling some forms "nominative" in one context and "absolutive" in the other, all forms are given an argument-structure-neutral label: direct vs. oblique. There are two agreement paradigms of verbal agreement with the subject, depending on argument structure.

The accusative sentences (instantiated by present tense) in Behdini behave similarly to English in having accusative objects and verbs agree with their subjects. In the present tense, the stressed progressive/habitual modal marker *di-* is prefixed to the present stem and the verb agrees with the subject and is marked by the suffixes shown in Table 2-4:

Table 2-4: Subject agreement morphemes accusative structures in Behdini

Suffixes	**Person**	**Number**
–im	First person	Singular
–î	Second person	Singular
–ît	Third person	Singular
–în	First person	Plural
–in	Second person	Plural
–in	Third person	Plural

The sentence in (4b) above is an example that shows the accusative pattern in present tense clauses in Behdini.

As for the ergative structure (instantiated by past tense), the intransitive verbs show agreement between S and V, which is formed by adding unstressed personal suffixes to the past stem of the verb. The past stem is derived by deleting the *-(i)n* ending of the infinitive, which leaves a past stem ending in a consonant, *û*, *î*, or *a*. As for the transitive ergative (past tense) verbs, the agreement is between O and V. This is known as the ergative pattern, and subjects take the oblique case.

Sentence (5) is an example for transitive ergative agreement paradigms between O and V.

(5) Min nan xwar
I.OBL bread.DIR eat.PAST

'I ate bread.'

Sentence (6) is an example for transitive ergative agreement paradigms between S and V.

(6) Ez nan-î di-xo-m
I.DIR bread.OBL PRST-eat-1SG
'I eat bread.'

Case markers in Behdini are determined by number and gender: morphological realization is clear in that a singular masculine noun takes *–î*; a singular feminine noun takes *–ê*; and a plural has *–a(n)*. Worth noting, the singular masculine form *–î* appears as *–y* when it follows a noun that ends in a vowel sound. The following examples are taken from Muhammad (2006) to show these case markers:

(7) a. Kutir-k-ê av-ø vexwar-ø.
Dove-DEF-OBL water.DIR drink.PAST.3SG
"The dove drank the water."

b. Aşevan-î genim-ø hêr-a.
Miller-OBL wheat-DIR grind.PAST-3SG
"The miller ground the wheat."

c. Paşa-y-î teyr-ek kuşt-ø.
King-DEF-OBL bird-DEF kill.PAST.3SG
"The king killed a bird."

Examples in (7) show that the agents of the Behdini sentences are assigned oblique case (or more generally ergative case). The above examples are singular. However, when they are changed into plural, the agent NPs will take the plural case marker which is *–a(n)*: *kutir-k-a(n)* "doves", *aşevan-a(n)* "millers", and *paşa-y-a(n)* "kings."

Behdini has a rich case system. The word *Gûrg* "wolf" is used in the following paradigm, adopted from Fromkin and Rodman (1983: 289). Interpretation of these cases depends on whether the clause is ergative or accusative, as explained in the following section.

Table 2-5: Case endings added to the word *Gûrg* "wolf"

Case-ending	**Case form**
Gûrg-ø	Direct
Gûrg-î (masc.sg.)	Oblique
Gûrg-ê (fem.sg.)	
Gûrga(n) (pl. masc. and fem.)	
Gûrg-ra	Dative
Gûrg-da	Locative
Gûrg-ve	

In Behdini, only present tense clauses show the accusative pattern. In these clauses, Behdini is like English in having accusative objects and verbs agreeing with their subjects. This means that in accusative case, subjects take the direct case and objects take the oblique case. So the direct case ending *-î*, *-ê* or *-an* (depending on singular masculine, singular feminine, and plural arguments respectively) are added to the S and A, whereas no case ending is added to the O as shown in (8).

(8) Eḧmed-î nam-ek di-nivîs-ît.
Ahmed-DIR letter-IND PRST-write-3SG
"Ahmed is writing a letter."

It is worth noting here that *ek* attached to *nam* "letter" in (8) is the marker for specific indefinites. Thackston describes the indefinite *ek* as follows:

> The sign of the indefinite singular ('a, any, some') is an unstressed enclitic *-ek (-yek* for words ending in vowels) added to the end of the absolute singular noun. Both masculine and feminine indefinite nouns have an oblique case, the endings of which echo the oblique demonstrative endings (*-î* for masc. and *-ê* for fem.). (Thakston, 2006: 10, 11)

Sentences in (9) show contrasted examples for the oblique endings of *-î* for masculine (9a) and *-ê* for feminine (9b).

(9) a. Kurk-ek-î ez gehand-im
Boy-IND-OBL.M me reach.PAST-1SG
"A boy gave me a lift."

b. Kičk-ek-ê ez gehand-im
Girl-IND-OBL.F me reach.PAST-1SG
"A girl gave me a lift."

Table 2-6 shows the morphological paradigm for Behdini present tense NPs

Table 2-6: Accusative system paradigm of Behdini NPs

Nominative Case **S/A**	**Accusative Case** **O**
-î (Singular Masculine) -ê (Singular Feminine) -an (Plural)	-ø

In Behdini, pronouns come in two forms, 'direct' and 'oblique' (see Table 2-7). In accusative (present tense) clauses, the 'direct' form is used for S and A, whereas the 'oblique' form is used for oblique-function, or O-function. The 'direct' form is glossed as being caseless, and the 'oblique' as accusative. This is shown in (10).

(10) a. Ez di-xwîn-im
1SG.DIR PRST-read-1SG
"I am reading."

b. Ew min di-be-t
3SG.DIR 1SG.OBL PRST-take-3SG
"He is taking me."

Table 2-7: Accusative system paradigm of Behdini pronouns

Direct pronouns (Nominative) S/A	Oblique pronouns[1] O
Ez	Min (I)
Tu	Te (You)
Ew	Wî/Wê (He/She)
Em	Me (We)
Hwîn	Hewe (You PL)
Ew(an)	Wan (They)

The following case system is assumed for Behdini Kurdish, which depends on gender distinction (Bozarslan, 2003: 6).

1 However, there are two exceptional verbs in Behdini that take the oblique form of pronouns, even in present tense clauses. These two verbs are divêt “want” and hey “to have.” For example:

Min kitêb-ek di-vêt.
I.OBL book-IND PROG-like
‘I want a book.’

Min kitêb-ek-a hey.
I.OBL book-IND-EZ.F have
‘I have a book.’

Table 2-8: The ergative case system in Behdini

Case	**Morphological realization**
Direct (absolutive)	-ø
Oblique	-î (masc.sg.) -ê (fem.sg.) -a(n) (pl. masc. and fem.)
Dative	-ra
Locative	-ve/-da

The direct case is considered to be the unmarked case form because it is not morphologically realized. It denotes S or O in Behdini past tense.

(11) a. Zarok-ø nivist-ø Intransitive
Child-DIR sleep.PAST-3S
"The child slept."

b. Nesrîn-ê zarok-ø rakir-ø. Transitive
Nesrin-OBL child-DIR carry.PAST-3S
"Nesrin carried the child."

In ergative clauses, the oblique case is morphologically marked. That is, some case markers are added to the noun stem of A in a sentence.

Moreover, the oblique case is assigned to NPs that have agreement features with their prepositional complements. Here, a head-complement configuration is fulfilled. Sentence (12) is an example that shows the oblique case markers added to the NPs, licensed by their prepositions:

(12) Azad-î name-k bû Helat-ê hinart-ø.
Azad-OBL letter-DEF to Helat-OBL send.PAST-3S
"Azad sent a letter to Halat." (Mohammad, 2006)

In (12) *Azad* takes the oblique marker *–î* because it is the subject of a transitive clause; also, *Helat* has *–ê* because it is structurally assigned by its antecedent *bû* "to" as a case assigner.

Personal pronouns in Behdini are full NPs, that is, they have all the assigning properties that NPs have. They show direct/oblique distinction. Generally speaking, Behdini has a system of six personal pronouns that show direct and oblique case forms (see Table 2-7).

The direct pronouns are used as the subjects of the verbs in all the tenses except the past tenses of transitive verbs, as in (13). The following examples are quoted from Muhammad (2006), with a manipulation.

(13) a. **Ew** di-çît-e nexoşxan-ê.
She.DIR PRST-go-3SG hospital-OBL
'She is going to hospital.'

b. **Hwîn** buçî dûdil-in?
You.DIR why worried-2PL
'Why are you worried?'

c. **Ez** çum-e sîk-ê.
I.DIR go.PAST-1SG market-OBL
'I went to the market.'

d. **Tu** dê xewn-a xo bicih în-î.
You.DIR will dream-EZ.F yourself fulfillment bring-2SG
'You will fulfill your dream.'

Direct pronouns are also used as the objects of transitive verbs in the past tense, such as in (14).

(14) a. Wê **ez** hêla-m.
She.OBL me.DIR leave.PAST-1SG
'She left me.'

b. Wan **tu** serdabir-î.
They.OBL you.DIR cheat.PAST-2SG
'They cheated you.'

c. Heval-î **hwîn** têgehand-in.
Haval-OBL you.DIR understand.PAST-2PL
'Haval made you understand.'

d. Min **ew** gehand-in.
I.OBL them.DIR reach.PAST-3PL
'I gave them a lift.'

The oblique pronouns are used as the subject of transitive verbs in the past tenses, as in (15).

(15) **Te** nam-ek nivîsî.
You.OBL letter-IND write.PAST
'You wrote a letter.'

Oblique pronouns are also used as the object of transitive verbs in both the present tense and future time, as in (16).

(16) a. Hwîn **me** di-nîyas-in.
You.DIR we.OBL PRST-know-2PL
'You (PL) know us.'

b. Ez dê **te** bîn-im.
I.DIR will you.OBL see-1SG
'I will see you.'

Oblique pronouns are also used as the object of a preposition, as in (17).

(17) Ew dê bu **me** axiv-ît.
He.DIR will to us.OBL speak-3SG
'He will talk to us.'

And finally, oblique pronouns are used in the genitive construction, as in (18).

(18) a. Tirumbêl-a **min**.
Car-EZ.F me.OBL
'my car.'

b. Pertok-a **te**.
Book-EZ.F you.OBL
'your book.'

c. Aheng-a **wê**
Party-EZ.F her.OBL
'her party.'

The dative case in Behdini denotes the indirect object. As mentioned in Table 2-10, it is morphologically realized by the case marker *–ra*:

(19) a. Ew-ø dê ji min-ra diyarî-yek-ê în-ît
She-DIR will to 1SG.OBL-DAT gift-IND-OBL bring-3SG
"She will bring a gift to me."

b. Wan ji Beyar-î-ra çîrok got.
They.OBL to Bayar-OBL-DAT story tell.PAST-ø
"They told the story to Bayar."

In (19), the case marker *-ra* is used and attached to the NPs *min* (I) and *Bayar* to show that they are indirect objects governed by their antecedents, which are prepositions.

Worth noting that there can be additional case-markers added to one noun stem. In (19a) the pronoun *min* (I) is in the oblique case but it has another case marker, *-ra*. The same is true with (19b) where the indirect object *Bayar* has two case markers: the oblique case *-î* and the dative case *-ra*. This phenomenon is called compound case marking (Blake, 1994: 107- 108). Compound case marking refers to the inclusion of two or more case markers within one phonological word.

The locative case, as shown in Table 2-10, is realized by the case markers *-da* and *-ve,* to denote place. The following examples are to survey the locative case:

(20) a. Sitiranbêj yê jider-ve.
Singer EZ.M outside-LOC
"The singer is outside."

b. Biçwîk yê di landik-ê-da.
Child EZ.M in cradle-OBL-LOC
"The child is in the cradle."

In (20b) the stem noun *landik* (cradle) has two case markers: oblique *-ê* and locative *-da*.

The agreement morphemes have different phonological realisations depending on their environment, i.e. whether the stem ends in a consonant or a vowel, as in Table 2-9. However, there is no such phonological effect in accusative structures.

Table 2-9: Verbal agreement paradigm in the ergative structure in Behdini

Subject agreement morphemes in intransitive verbs	AFTER CONSONANTS		AFTER VOWELS	
	1SG: –im	1PL: –în	1SG: –m	1PL: –yîn
	2SG: –î	2PL: –in	2SG: –yî	2PL: –n
	3SG: –ø	3PL: –in	3SG: –ø	3PL: –n

Examples in (21) survey the agreement pattern between S and V in intransitive ergative (past tense) clauses.

After consonants:

(21) a. Ez hat-im
I come.PAST-1SG
'I came.'

b. Tu hat-î
You come.PAST-2SG
'You came.'

c. Ew hat
He com.PAST.3SG
'He came.'

After vowels:

d. Ez bû-m
I exist.PAST-1SG
'I existed.'

e. Tu bû-yî
You exist.PAST-2SG
'You existed.'

c. Ew bû
He exist.PAST.3SG

'He existed.'

Table 2-10 provides a summary of the interaction of the case and agreement paradigms.

Table 2-10: Morphological manifestations of split-ergativity in Behdini

	Accusative clauses (Present or future)			**Ergative clauses** (Past tense)	
A (Agent)	Direct	[p,n]	A	Oblique	/
O (Object)	Oblique	/	O	Direct	[p,n]

Table 2-11 is a summary which shows the morphological paradigms for nouns and pronouns in Behdini.

Table 2-11: Behdini morphological paradigms for nouns and pronouns

<table>
<tr><th colspan="2"></th><th>DIRECT</th><th>OBLIQUE</th><th>DATIVE</th><th>LOCATIVE</th><th>LOCATIVE (compound morphology)</th></tr>
<tr><td colspan="2">Nouns</td><td>-ø</td><td>-ø
-î (Masc)
-ê (Fem)
-an (PL)</td><td rowspan="3">-ra</td><td rowspan="3">-da/-ve</td><td rowspan="3">-î-ra/-ê-da</td></tr>
<tr><td rowspan="2">pronouns</td><td>1SG</td><td>Ez</td><td>Min</td></tr>
<tr><td>2SG</td><td>Tu</td><td>Te</td></tr>
</table>

	3SG	Ew	Wî/Wê			
	1PL	Em	Me			
	2PL	Hwîn	Hewe			
	3PL	Ew(an)	Wan			

Table 2-12 is another summary that shows the agreement morphemes on the verb.

Table 2-12: Agreement morphemes on verbs in Behdini

PRESENT TENSE		PAST TENSE (TRANSITIVE)			
Suffixes	Person and number	After consonants		After vowels	
		Suffixes	Person and number	Suffixes	Person and number
–im	1SG	–im	1SG	–m	1SG
–î	2SG	–î	2SG	–yî	2SG
–ît	3SG	–ø	3SG	–ø	3SG
–în	1PL	–în	1PL	–yîn	1PL
–in	2PL	–in	2PL	–n	2PL
–in	3PL	–in	3PL	–n	3PL

2.1.4 Syntactic Patterns

A language is said to be syntactically ergative if the same treatment of arguments on the morphological level are displayed on a syntactic level (Ura, 2000: 9, 212-216 and Butt and Doe, 2003: 2-3).

There is evidence that Behdini clauses may follow a nominative-accusative pattern with respect to their syntactic behaviour. For instance, the coordinated clauses in Behdini, whether transitive or intransitive, follow a nominative-accusative pattern where S and A, but not O, can control the missing arguments in the second clause. Sentences (22) and (23) illustrate this idea.

(22) Azad-ø$_i$ çû di jûr-ve u [-----$_i$nivis-t].
Azad-DIR go.PAST into room-LOC and [----- sleep.PAST-3SG]
"Azad went into the room and slept." (Mohammad, 2006)

(23) Zarûk-í$_i$ pencer-ø şikand u [-----$_i$rev-í].
Child-OBL window-DIR break.PAST and [-----iescape.PAST-3SG]
"The child broke the window and escaped." (Mohammad, 2006)

The first clause in (22) is intransitive and is coordinated with another intransitive clause. Here the subject of the second clause is deleted and the only possibility of such an argument-omission is that the S of the matrix clause controls the missing argument of the second clause. In (23) the first clause of coordination is transitive, but the A argument, not O, again controls the missing argument in the second clause.

In (24) an O argument, *zarûk* "child" is used to show the position of the missing argument

(24) Azad-ø$_i$ çû di jûr-ve u [zarûk-î $_i$niv-and]. ?
Azad-DIR go.PAST into room-LOC and [child-OBL hypnotize.PAST-3SG]
"Azad went into the room and hypnotized the child."

Examples in (22) and (23) show that an accusative syntax operates even in ergative clauses. This is interesting because it implies that Subject Restriction will follow accusative syntax in Behdini.

The evidence from the application of relative-clause test also indicates nominative-accusative syntax for Behdini, since in the process of subordination, embedded-clause subjects and agents may be deleted, but embedded-clause objects may not. In the following example both S and A, but not O, behave as to be the same argument:

(25) Ew zarûk-ê nivist-í şîr ne-xar.
That child-EZ.M sleep.PAST-3S milk NEG-eat.PAST
"The child that did not have milk slept."

In Behdini, syntactic accusativity is also found in what is called Equi-NP Deletion. In a sentence with two clauses, where there is a noun phrase in the matrix clause which is co-referential to a noun phrase in the embedded clause, the noun phrase in the embedded clause may be deleted. This rule is referred to as "Equi-Noun-Phrase Deletion" (Friend, 1985: 9).

Friend (1985) argues that Equi-NP Deletion rules can be used to determine the extent of ergativity in a language by noting the following two types of noun-phrase behaviour:

> (1) which of the grammatical relations S, A, or O, control deletion of co-referential noun phrases in embedded clauses, and (2) which of the grammatical relations in embedded clauses may delete. If S and O in the matrix clause control deletion, but A does not, or if A in the matrix clause controls deletion while S and O cannot (an unlikely possibility), then this might be evidence of ergative-absolutive syntax. If, on the other hand, S and A control deletion while O does not, or if only O controls deletion, while S and A do not, then this might be evidence of nominative-accusative syntax. Also, if there is a difference in behaviour of noun phrases in the embedded clause, such that S and O in embedded clauses may delete and A may not, or only A may delete and S and O may not, then this might also be evidence of ergative-absolutive syntax. However, if in embedded clauses S and A may delete and O may not, or O may delete and S and A may not, thus might be evidence of nominative-accusative syntax (Friend, 1985: 9).

In a finite subjunctive form, the Equi-NP deletion is shown on person and number clearly:

(26) Wî$_i$ divî-ya [-----$_i$zarûk-î bi-helgir-ît].
He.OBL want.PAST-3S [----- child-OBL PRST-carry-3SG]

"He wanted to carry the child." (Mohammad, 2006)

Sentence (26) indicates that the missing transitive argument, which is the nominative *ez* "I", in the subjunctive clause is treated the same as the transitive oblique form *wî* "he" because *ez* "I" is controlled by *wî* "he". In other words, the evidence from Equi-NP deletion seems to indicate nominative-accusative syntax rather than ergative-absolutive morphology because S and A, but not O, may be deleted.

Therefore, it can be argued that Behdini features syntactic accusativity.

2.1.5 Morphologically licensed pronoun omission

Behdini is a pronoun-dropping (hereafter, pro-drop) language, but argument drop occurs only in cases where the dropped argument agrees with the verb. Thus argument drop takes place with object omission in ergative structures because the verbal agreement is with the object. But with subject omission, it takes place in accusative structures because the verbal agreement is with the subject. In other words, it can be said that verbal agreement in Behdini is with S/A in the accusative system, but with S/O in the ergative system.

In ergative contexts, Behdini demonstrates a case in which, even if the patient pronoun is not expressed, the patient will still be inextricably built into the verb**.** Sentence (27) is an example in which the patient pronoun is omitted and the reliance is on the agreement to recover the features of the patient.

(27) a. Min dît
I.OBL see.PAST.3SG
'I saw him.'

This means that the reader can depend on the agreement suffix to indicate the identity of the patient when it is not overtly expressed.

However, only third person pronouns can be omitted. The agreement patterns are the same. That is, this is an exception for second person singular and plural object pronouns. Therefore, omitting the second person singular object pronoun *tu* 'you.*S*' (28) and second person plural object pronoun *hwîn* 'you.P' (29) result in the ungrammatical sentences in 28 and 29.

(28) *Min dît-î
I.OBL see.PST.2SG
'I saw you.'

(29) *Min dît-in
I.OBL see.PST.2PL
'I saw you(P).'

In contrast, the examples in (30), with explicit second person singular and plural object pronouns, yield grammatical sentences.

(30) a. Min tu dît-î
I.OBL you.DIR see.PST-2SG
'I saw you.'

b. Min hwîn dît-in.
I.OBL you.DIR see.PST.2PL
'I saw you (P).'

Therefore, objects are only dropped if they are 3rd person in ergative clauses. This means that 1st and 2nd persons plural and singular are excluded and accusative clauses are also excluded.

To confirm this, a follow-up Judgement Task has been conducted, in which thirty Behdini native speakers participated. The informants were asked to select the correct personal pronoun being referred to in sentences like (31). Table 2-13 shows the results. Sentences with omitted object pronouns in ergative and accusative structures (see Appendix 1) were presented. After each sentence, six options with the possible omitted Behdini person pronouns were given and participants were asked to choose the correct option that matches the omitted pronoun in each sentence. The pronouns in the six options the participants had to choose from were "him/her", "them", "you.SG", and "you.PL", plus two more options for "more than one person" and for "ungrammatical."

(31) a. Min dît.
I.OBL see.PST.3PS
'I saw him.'

b. Me dît-in.
We.OBL see.PST-3PP
'We saw them.'

Table 2-13: Object omission in ergative and accusative sentences in Behdini

Conditions and examples	Him/her	Them	You.S	You.P	More than one person	Ungram-matical
(1) Ergative object omission with third person singular subjects, e.g. Min __ dît. I.OBL saw.3PS 'I saw him.'	99%	-	-	-	1%	-
(2) Ergative object omission with third person plural subjects, e.g. Me __ dît-in. We.OBL saw-3PP 'We saw them.'	8%	92%	-	-	-	-
(3) Ergative object omission with second person singular subjects, e.g. *Min __ dît-î. I.OBL saw-2PS	-	-	10%	-	5%	85%

'I saw you.'						
(4) Ergative object omission with second person plural subjects *Min __ dît-in. I.OBL saw-2PP 'I saw you(P).'	-	-	-	-	6%	94%
(5) Accusative object omission Ez __ di-bîn-im. I.ACC see-1PS 'I see.'	-	-	-	1%	90%	9%

It is to be noted that (1), (2), and (5) in Table 2-13 are grammatical items, whereas (3) and (4) are ungrammatical items. The results of this test support the assumption that the object pronoun can be omitted in ergative sentences, in which case the ergative agreement marker helps recover the features of the object. The results show that this is possible only with third person singular and plural objects, not with first and second persons. It is also shown that in the case of accusative sentences, the features of the omitted object cannot be realized because the agreement in accusative clauses is between the subject and the verb. That is why 90% of the subjects selected the 'more than one person' option for the accusative sentences. So based on the results of this test, object RPs can be omitted when the subject is a third person singular or plural and only in ergative contexts, not in accusative contexts.

On the other hand, in accusative structures, as mentioned earlier, the verbal agreement is with the subject. In accusative contexts, the subject pronoun can be dropped because the form of the verb is such that one can identify the features of the subject when omitted, whether in past or in present tense. Consider the examples in (32) for sentences with subjects and (33) for the same sentences when the subject is omitted. (32a) and (33a) are in past tense, whereas (32b) and (33b) are in present tense.

(32) a. Ez hat-ime mal.
I come.PAST-SG1 home
'I came home'

b. Tu di-hĕ-ye mal.
You PRST-come-SG2 home
'You come home.'

(33) a. Hat-ime mal.
Come.PAST-SG1 home
'I came home'

b. Di-hĕ-ye mal.
PRST-come-SG2 home
'You come home.'

The sentences in (32) and (33) show that Behdini is a subject drop language. However, subjects can only be omitted in accusative clauses in transitive sentences, as in (34) and (35).

(34) Accusative clauses with subject (Grammatical)

a. Ez te di-bîn-im.
I you PRST-see-SG1
'I see you.'

b. Ez hewe di-bîn-im.
I you(P) PRST-see-SG1
'I see you(P).'

(35) Accusative clauses subject dropped (Grammatical)

a. Te di-bîn-im.
You PRST-see-SG1
'I see you.'

b. Hewe di-bîn-im.
You(P) PRST-see-SG1

'I see you(P).'

It is impossible for subjects to be dropped in ergative clauses, as in (36) and (37).

(36) Ergative clauses with subject (Grammatical)

a. Min tu dît-î.
I.OBL you.DIR see.PST.2SG
'I saw you.'

b. Min hwîn dît-in.
I.OBL you.DIR see.PST.2PL
'I saw you(P).'

(37) Ergative clauses subject dropped (Ungrammatical)

a. Tu dît-î.*
You.DIR see.PST.2SG
'I saw you.'

b. Hwîn dît-in.*
You.DIR see.PST.2PL
'I saw you(P).'

2.2 The Ezafe in Behdini

The term 'Ezafe' is adopted from Arabic grammar (iḍāfat), where it means 'addition' or 'supplement'. In Behdini, the Ezafe has largely retained its demonstrative/relativizer origins, and also occurs as a nominalizer, since it transforms some form of modifying phrase, such as a possessive attribute or an adjective, into an NP. The nominalizer shares some characteristics with the English pronoun *one*.

In Kurdish the Ezafe is one of the most frequent grammatical morphemes and occurs in a number of partially overlapping functions. It inflects for gender (masculine vs. feminine) and number (singular vs. plural) and the definite Ezafe can act as a copula in some verb-less constructions.

The forms of the definite Ezafe in modern Behdini are shown in Table 2-14.

Table 2-14: Forms of the definite Ezafe in Behdini

Masculine	Feminine	Plural
Yê	Ya	yên (written form) yêt (spoken form)

(38) Ev   qeleme yê   min-e.
This pen   EZ.M me-is
'This pen is mine.'

According to Haig (2011), the numerous functions of the Ezafe in Behdini can be conveniently divided into two broad groups:

1- The adnominal linking function, i.e. when the Ezafe links a post-nominal modifier to the head noun; the gender and number of the head noun determine the choice of Ezafe particle, for example:

(39) a. dest-ê   te
hand-EZ.M you:OBL
'your hand'

b. mal-a   mezin
house-EZ.F   big
'big house'

c. heval- ên   kiçk-ê
friend-EZ.PL girl-OBL
'friends of the girl'

2- The demonstrative/anaphoric function, i.e. when the Ezafe is used independently of a head noun, for example:

(40) Şev-ên   zivistan-ê   dirêj-in, yên   havînê   kurt-in.
night-EZ.PL winter-OBL long-are EZ.PL summer short-are
'The nights of winter are long, those of summer are short.'

Another notable feature of Ezafe in Behdini is that it links a relative clause to the head, for instance:

(41) Jin-a ku min dît-î
Woman-EZ.F that I.OBL see:PAST.3SG
'The woman that I saw'

Although the Ezafe is not a copula, it must be considered as some kind of clausal operator, giving a finite clause a particular tense/aspect value. Haig (2011) does mention the Ezafe contributing to tense, under certain conditions. He presents the Tense Ezafe and claims that it is used in an additional construction. He provides a number of examples to illustrate the notion of how the Tense Ezafe works. One of his examples is cited below:

(42) Xuşk-a min **ya** çuy-î sîk-ê
sister-EZ.F 1S.OBL **EZ.F** go:PST-PTCPL market-OBL
'My sister has gone to the market.'

In (42), the Ezafe that is bold-faced functions as a tense Ezafe in that it determines that the tense of the sentence is present perfect.

The Tense Ezafe can also attribute the progressive aspect to the clause, as shown in (43) below:

(43) Rîmun yê seyar-ek-ê di-kirr-ît.
Rimon **EZ.M** car-IND-OBL PRST-buy-3SG
'Rimon is buying a car.'

Ezafe should not to be confused with some other categories, such as the complementizers in wh-structures.

2.3 Light Verbs in Behdini

Light verbs (LVs) are a number of verbs that can be combined with other lexical categories to form complex constructions meaning "to do" or "to become." They are combined with a verbal noun (VN) (Dootsan, 1997: 43 quoted from Karimi, 1997). In the following examples, the LVs are represented in capital letters and the VNs in bold face; (44a and b) are ergative; while (44c and d) are accusative:

(44) a. Con-î le'abe bo Marî **pêşkêş** KIR.
John-OBL doll to Mary giving do.PAST

'John gave the doll to Mary.'

b. Kulumbus-î Emirîka **keşif** KIR.
Culumbus-OBL America discovery do.PAST
'Culumbus discovered America.'

a. Con le'abe bo Marî **pêşkêş** DI-KE-T.
John doll to Mary giving PRST-do-3SG
'John gives the doll to Mary.'

b. Kulumbus Emirîka **keşif** DI-KE-T.
Culumbus America discovery PRST-do-3SG
'Culumbus discovers America.'

Light verbs are referred to in this study to assist readers' understanding of the Behdini sentences used throughout the study that contain such verbs and, in part, because their presence (when used with a preposition) tends to license the use of RPs.

2.4 Preposition stranding

Preposition stranding is the syntactic construction in which a preposition is left without a following object. Preposition stranding is impossible in Behdini wh-structures, both in relative clauses and in wh-questions. Sentences in (45) below illustrate that prepositions in Behdini relative clauses cannot be stranded or hanging.

(45) a. Ew zelam-ê ku min xanî j-ê kirr-î
Det man-EZ.M Comp I.OBL house from-him buy.PAST-1S
hat.
come.PAST.3SG
"The man that I bought the house from came."

b. Ew tîm-a ku me dijî wan yarî kir-î serkeft-in.
Det team-EZ.F Comp we.OBL against them play do.PAST-3P won-3PL
"The team we played against won the match."

c. Ew tirumbêl-a ku ez bi wê hat-îm ya sor bu.
Det car-EZ.F Comp I.DIR by it come.PST-1S EZ.M red be.PAST
"The car I came with was red."

In (45a) the preposition *ji* "from" requires the pronoun *wî* "him" presented in short form here as *ê*. The same is true regarding the prepositions *dijî* "against" and *bi* "by" which require the presence of the pronouns *wan* "them" and *wê* "it" in (45b) and (45c) respectively. Therefore, the examples in (45) are grammatical and they show that preposition requires an obligatory presence of pronouns. The contrastive examples in (46), on the other hand, show the ungrammaticality of preposition stranding in Behdini. In other words, prepositions cannot stand alone without pronouns.

(46) a. *Ew zelam-ê ku min xanî ji kirr-î
Det man-EZ.M Comp I.OBL house from buy.PAST-1S
hat.
come.PAST.3SG
"The man that I bought the house from came."

b. *Ew tîm-a ku me dijî yarî kir-î serkeft-in.
Det team-EZ.F Comp we.OBL against play do.PAST-3P win.PAST-3PL
"The team we played against won the match."

c. *Ew tirumbêl-a ku ez bi hat-îm ya sor bu.
Det car-EZ.F Comp I.DIR by come.PAST-1S EZ.M red be.PAST
"The car I came with was red."

Sentences in (47) show the impossibility of preposition stranding in wh-questions. The example in (47a) shows that the preposition *dijî* 'against' requires an obligatory presence of the pronoun *wan* 'them.' Similarly, (47b) shows that *j* 'from' requires an obligatory presence of *ê* 'him.'

(47) a. Kîşk-e ew tîm-a hewe yarî dijî wan kir-î?
What-is that team-EZ.F you play against them do.PAST.2PL
"What is the team you played against?"

b. Kîy-e ew zelam-ê te xanî j-ê kirr-î?
Who-is that man-EZ.M you house from-him buy.PAST-2SG
"Who is the man you bought the house from?"

Sentences in (48) are contrasting examples of wh-questions that contain prepositions without the use of pronouns, which is why they are ungrammatical.

(48) a. *Kîşk-e ew tîm-a hewe yarî dijî kir-î?
What-is that team-EZ.F you play against do.PAST.2PL
"What is the team you played against?"

b. *Kîy-e ew zelam-ê te xanî ji kirr-î?
Who-is that man-EZ.M you house from buy.PAST-2SG
"Who is the man you bought the house from?"

The impossibility of preposition stranding in Behdini wh-structures is surveyed here because the presence of prepositions in relative clauses and wh-questions requires the use of resumptive pronouns. This is crucially relevant to NP-internal or possessive positions in relative clauses, which are complements of prepositions (see 4.4).

In summary, the key aspects of Behdini grammar covered in this chapter include ergativity, case marking, morphologically licensed pronoun omission, Ezafe, light verbs, and preposition stranding.

Unlike English, Behdini was shown to encode split ergativity. In particular, this means that the accusative case system functions in intransitive past tense and intransitive and transitive present tense, whereas the ergative case system functions in transitive past tense. However, English shows an accusative case system under all circumstances.

Behdini was also shown to be a pro-drop language, meaning that the argument pronouns can be dropped in cases where they show an agreement with the verb (the argument corresponds to objects in ergative structures and to subjects in accusative structures). This is different from English, in which the arguments can never be dropped.

The Ezafe particle is used in Behdini NPs to inflect for gender and number, whereas English lacks such a morpheme.

The only case in which Behdini uses a combination of verb forms is in light verbs, where certain verbs are combined with other lexical categories to form complex VPs. Otherwise, Behdini uses simple VPs (i.e. verb phrases containing one verbal element). However, English frequently uses combinations to form complex VPs (i.e. combinations of verb forms), for example to show aspect and voice, which are realized by means of e.g. 'have' and 'be': 'They have gone' (perfect-aspect) and 'He was seen' (passive).

Finally, evidence was provided that preposition stranding, which is possible in English, is not possible in Behdini wh-structures, either in relative clauses or in wh-questions. This means that prepositions in English can stand alone without a pronominal element, whereas in Behdini prepositions require an obligatory presence of a pronoun.

CHAPTER 3

LITERATURE REVIEW ON SECOND LANGUAGE ACQUISITION AND LANGUAGE PROCESSING

The present study follows the generative approach to Second Language Acquisition (SLA), which is briefly outlined in this chapter. More specifically, the attempt will be made to cover themes that are central to the generative approach, such as Universal Grammar (UG), interlanguage, fossilisation, first language (L1) transfer, and processing. This chapter is split into two main sections: one on SLA and one on sentence processing, in general.

3.1 Linguistic Approaches to SLA

3.1.1 Generative Approaches to SLA

The generative approach postulates that UG constrains first language acquisition. Many generativists also argue that UG constrains second language acquisition, although this is modulated by the influence of the first language and age factors. The initial state of SLA is generally assumed to be the grammar of the L1.

The generative approach treats the growing L2 as an "interlanguage," as first suggested by Selinker (1972). Interlanguage is a system corresponding to the competence of the second language learner, and Interlanguage keeps evolving until fossilisation is reached (i.e. progress is no longer possible). Generativists argue that interlanguage is constrained by UG.

3.1.2 Universal Grammar

UG is an innate, biologically endowed language faculty, a system of principles, conditions, and rules that are elements or properties of all human languages (Chomsky, 1976: 29). In other words, UG permits the L1 acquirer to arrive at a grammar on the basis of linguistic experience (exposure or input). White (2003) presupposes that UG constrains L1 acquisition.

Chomsky considers language as "a perfect system which has optimal design" (Chomsky, 2002). It comprises lexis (the total amount of lexical and functional items of a particular language and their linguistic features), syntax, and the semantic component, which "maps or converts the syntactic structure into a corresponding semantic representation of the linguistic aspects of its meaning." It also includes a phonetic form (PF) component, which in turn, "maps the syntactic structure into a Phonetic Form representation, telling us how each word is pronounced" (Radford, 2004: 5).

3.1.3 Principles and parameters of UG

Universal Grammar Principles are common to all human languages. It is proposed that there are so many language characteristics and features that are so complex that they would take a long time for the language learner to acquire them consciously (Lightbown and Spada, 2006).

Principles of UG "define the structural architecture of human language," whereas the "variation between particular languages is accounted for by a small number of parameters of variation allowed within the overall design defined by the principles" (Hawkins, 2001: 13).

The sentences in (49) from English and Italian illustrate a kind of parametric variation across languages:

(49) a. Roberto gioca a tennis.
Roberto play to tennis
'Roberto plays tennis.'

b. Gioca a tennis.
Play to tennis
'Plays tennis.'

c. Roberto plays tennis.

d. *Plays tennis.

The above data demonstrate that, both in English and Italian, verbs can take an overt subject and object. However, in Italian the verb can be used without an overt subject (or it has a null subject), but in English the verb *plays* cannot stand without an overt subject. That is why sentence (d) cannot be grammatical. Italian is a null-subject language, but English is not. It is to be noted that Behdini is similar to Italian in this respect as it demonstrates a null subject in accusative case (see chapter 2).

This study assumes that there is a parameter associated with wh-dependencies, which determines whether wh-movement is involved or not. This has an impact on what happens at the foot of the chain: gap or RP (and what kind of RP) (see chapter 5 for a detailed explanation of this). The predictions of the SLA experiment in this study will be structured in terms of parameter resetting, and they will be investigated in terms of the properties of the foot of the chain (i.e. what it can host) and island sensitivity (as a diagnostic for wh-movement).

3.1.4 Access to UG

The issue of access to UG in the interlanguage grammar development has been one of the main research subjects in the field of generative SLA. A wide range of research has tackled the issue of possibility and impossibility of parameter setting.

Some of these research proposals represent contradictory accounts maintaining the possibility of parameter resetting unequivocally (for instance Schwartz & Sprouse, 1996), and others proposed a lack of this possibility (Flynn & Martohardjono, 1994 and Epstein et al., 1998). On the other hand, another trend of original proposals calls for the existence of a partial access. These accounts hypothesize that there are local impairments or qualified possibilities for resetting (for instance Hawkins & Hattori, 2006; Tsimpli & Dimitrakopoulou, 2007).

In this study the predictions of both the Interpretability Hypothesis and the Full Transfer Full Access (FT/FA) Hypothesis (Schwartz & Sprouse, 1994) will be tested. The FT/FA is a widely accepted hypothesis in SLA, which suggests that the L1 grammar, including L1 parameter settings, constitutes the initial state of L2 acquisition (full transfer), but that L2 learners have full access to UG at all times during the acquisition process (full access), thus parameter resetting is usually possible.

The full access model maintains that the interlanguage grammar evolves gradually to accommodate data not captured by L1 grammar, and UG constrains that process. Final convergence with L2 target is not guaranteed, because of upheld properties of the L1

FT/FA (Schwartz & Sprouse, 1996) proposes that the initial state involves all the abstract representations of a learner's L1 and unrestricted access to UG. This hypothesis states that L2ers have full access to UG and are not restricted to representations that they transfer from L1, yet they have the ability to restructure their native language grammar according to the L2 input provided. The impossibility of full convergence with the target language is explained by the ineffectiveness (and lack of) negative evidence that would be necessary to reset parameter values that are in a superset-subset relation between the L1 and the L2.

FT/FA presumes that the L1 grammar establishes the initial state of L2 acquisition. Parses of input will result in L1 parameter resetting. However, if it is not possible for the current grammatical representation to parse input strings, this would prompt restructuring. Access to UG means that new parameter settings are, in principle, available to the L2 learner.

3.1.5 The Variational Learning Hypothesis

The Variational Model of Language Acquisition was suggested by Yang (2002), who claims that all UG-defined grammars are accessible to the learner at the beginning, and that language acquisition is a process of competition among these grammars. Slabakova (2008) proposes that this can extend to L2 acquisition if FT/FA is taken into account.

Slabakova (2008: 116) proposes that Variational Learning is "logically extendable" to SLA as there is more variability in the production of L2 learners than children learning their L1. Moreover, more variability exists in learner-directed speech based on naturalistic or instructed L2 settings. When Variational Learning is applied to L2 acquisition, additional variables should be taken into account, such as the status of the value of L1 parameter, and "whether it is just one among many or whether it enjoys some privileged status" (Slabakova, 2008: 116). Based on the expectations of FT/FA, it will make sense to suppose that the values of L1 parameter actually own a privileged status. Slabakova seems to acknowledge this fact when she said: "Assuming L1 transfer, the native value would be the logical starting point of the learner, accessing the others only if the native one fails" (Slabakova, 2008: 120).

Slabakova (2008: 117) points out that the rise of the target value to its top probability (possibly 0.8 rather than 1) correlates with the percentage of sentences in the input that unambiguously reward the target parameter value and punish the others.

Given the similarities and differences in Behdini and English resumption that will be discussed in the next chapter, at the initial state, L1 Behdini speakers are expected to access intrusive pronouns (RPs in island structures) based on L2 grammar to parse English input. However, when encountering an L2 input string which is incompatible with a resumptive parse, these representations will be 'punished' and thus be less likely to be accessed in the future.

Full Transfer plus Variational Learning would predict that gap/RP parametric settings will not be completely lost in L1 Behdini-L2 English acquisition, but will "linger around" as English does not provide unambiguous evidence that will consistently punish them.

3.1.6 The Issue of Critical Period

In a nutshell, the Critical Period Hypothesis claims that language acquisition abilities are biologically linked to age. This hypothesis is originally suggested by Penfield and Roberts (1959) and later followed up by Lenneberg (1976) who proposed that it could be extended to the second language acquisition. Initially, it was assumed to affect all areas of language competence (Johnson & Newport, 1989). This is realized in subsequent studies that found the same result, i.e. that L2 acquisition correlates negatively with the age at which the learning starts before puberty. By contrast, among late learners, the correlation of age with learning performance suggests that different mechanisms other than maturation are affecting adults' proficiency (Birdsong & Molis, 2001; Hakuta et al., 2003; among others). According to these recent proposals, not all modules of language competence are subject to a critical period. For example, both the Bottleneck Hypothesis and the Interpretability Hypothesis, that will be discussed below, predict that phenomena with a semantic import should not be subject to a critical period in SLA.

Moreover, theoretically speaking, a number of researchers hold the view that native-like attainment can be achieved by some learners regarding certain grammar modules, as well as the individual features within those modules. Slabakova (2013) states that "there is no critical period for the acquisition of phrasal semantics, while functional morphology may be the real bottleneck of L2 acquisition."

3.1.6.1 The Interpretability Hypothesis

There are two types of formal features that are applicable to the grammar-meaning interface, namely, interpretable and uninterpretable features. The interpretable features are connected to the semantic features and are understandable semantically. They also participate in the process of interpretation, thus cannot be excluded. By contrast, uninterpretable features must be removed before Spell-Out because they do not contribute to the interpretation of meaning.

The Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007) predicts that interpretable features are available for L2 acquisition, irrespective of what the L1 grammar instantiates. This is because it is not subject to maturation constraints, with over-compensation for the unavailability of certain uninterpretable features. The interpretable features act as a filter in the parsing of the input.

Tsimpli and Dimitrakopoulou (2007) investigated the acquisition of wh-dependencies by Greek learners of English, and they found out that resumptive pronouns (RPs) in Greek have uninterpretable features, which are based on case and agreement. These features are not visible at the Logical Form (LF), as shown in (50).

(50) Pjoni ipesoti (toni) prosevalan xoris logho?
whom said:2 SG that him insulted:3 PL without reason
'Who did you say they insulted without reason?'

Researchers have primarily studied the status of RPs in the acquisition of interrogative clauses and wh-structures. However, there are no studies that focus on the appropriateness of Interpretability Hypothesis in the acquisition of wh-dependencies by Behdini learners.

The difference between RPs in Behdini L1 and English L2 is parametric in nature (as will be seen in chapter 4, i.e., that Behdini uses RPs obligatorily in possessive structures, whereas English takes gaps obligatorily). Therefore, the Interpretability Hypothesis predicts that the RP parameter will resist resetting for the L2 learners as the relevant features are uninterpretable [i.e., -interpretable]. Thus it can be argued that Behdini learners of English might accept RPs in positions where they are ungrammatical in English, especially at lower proficiency levels.

3.1.6.2 The Bottleneck Hypothesis

This hypothesis was proposed by Slabakova in conjunction with the Variational Learning model. In the discussion of L2 acquisition theory, Slabakova (2009) answers the question, "What is easy and what is hard in second language acquisition?," by offering her Bottleneck Hypothesis. The gist of this hypothesis is that functional morphology is the bottleneck of L2 acquisition; meaning that the acquisition of syntax and semantics (and maybe even pragmatics) flows smoothly (Slabakova, 2006, 2008). In other words, inflectional morphemes and their features present the main challenge to L2 learners, while syntax and phrasal semantics pose less difficulty.

To shed light on what should or should not be learned by L2ers, and what comes freely in second language acquisition, Slabakova (2009) assumed Reinhart's (2006) widely accepted model of grammar, which is shown in figure 3-1.

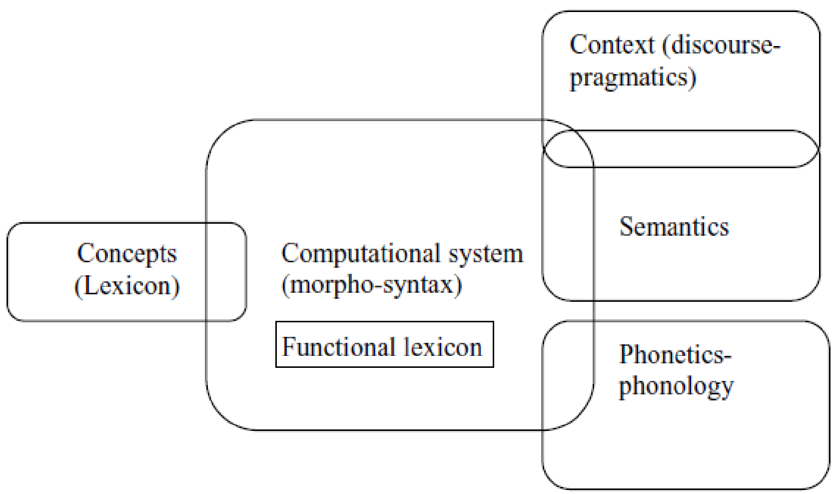

Figure 3- 1: Modular design of the language faculty (Reinhart, 2006)

Slabakova (2009) assumes the Minimalist premise, indicating that the functional lexicon is where language variation is encoded, while meanings (the content of thought) are universal. Inflectional morphology in the Minimalist linguistic theory is part of the lexicon, the so-called Functional Lexicon, and is crucial in integrative syntactic processes. The functional lexicon also carries information about grammatical meanings through interpretable features (e.g. tense, aspect, definiteness, etc.). It also carries information about displacement of phrases (movement) through uninterpretable features. The inflectional morphology should be learned along with other lexicon entries. All of this follows reasonably from this language architecture, in which learning a second language involves learning new configurations in which the various interpretable and uninterpretable features are mapped onto the target language inflectional morphology.

The Bottleneck Hypothesis builds on the "syntax-before-morphology" view, according to which syntactic (integrative) properties are acquired before target-like inflectional morphology, in production. This is based on many studies of child and adult L2 production, such as Haznedar and Schwartz, 1997; Haznedar, 2001; Ionin and Wexler, 2002. They investigated whether the comprehension of the morphology would be different and easier. The data of these three studies are summarised by White (2003: 189) who, judging from the results of those studies, concluded that it is not possible to say that morphology drives syntactic acquisition.

It is concluded that syntax precedes morphology both in production and comprehension (White, 2003; Slabakova and Gajdos, 2008).

The prediction that the Bottleneck Hypothesis makes for our study is that the acquisition of wh-dependencies involving movement should not be problematic for Behdini learners' L2 English acquisition.

3.1.7 Predictions of Relevant SLA Hypotheses

This section provides a summary on the predictions of the SLA hypotheses that will be tested in this study, which are the FT/FA Hypothesis (Schwartz & Sprouse, 1996), the Variational Learning Hypothesis (Slabakova, 2008), the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007), and the Bottleneck Hypothesis (Slabakova, 2013).

The FT/FA predicts that the interlanguage of Behdini learners will be fully constrained by UG, though it will not be possible to test whether full convergence is possible since this study does not include near native speakers.

The Variational Learning Hypothesis predicts that the optionality patterns of Behdini (i.e. the two types of wh-dependencies) will be transferred into the interlanguage of the L2 learners of English. The expectation is that Behdini learners of English will over-accept RPs and over-reject gaps, especially at lower proficiency levels.

The Interpretability Hypothesis predicts that Behdini learners of English will not be able to fully reset the parameter that allows true RPs, because the features involved in their derivation are Interpretable at LF, and therefore RPs will continue being over-accepted in their English interlanguage.

The Bottleneck Hypothesis predicts that acquisition of wh-dependencies involving movement should not be problematic for Behdini learners' L2 English acquisition.

3.2 Implicit/Explicit Knowledge in L2 Acquisition

This section shows the distinction between L2 learners' implicit and explicit knowledge and different methods for tapping into them. First language development is assumed to inverse implicit knowledge. In other words, the learning is incidental without an awareness of what is learned (Rebuschat & Williams, 2009). The view that adult learners acquire non-native syntax implicitly is supported by many studies (e.g., Rebuschat, 2008; Robinson, 2005; Williams & Kuribara, 2008).

The generative view is that true linguistic competence is implicit knowledge. However, it is possible, in principle, that explicit knowledge could be ascertained by means of grammaticality judgment tasks.

In the non-generative approach to SLA, there is a debate as to the implicit vs. explicit nature of language competence in a second language. Examples for studies maintaining explicit knowledge are Fotos, 1993; Han & Ellis, 1998; Cleary & Langley, 2007; Rebuschat & Williams, 2006, 2009; among others. On the other hand, examples for studies focusing on implicit knowledge are de Graaf, 1997; deKeyser, 1995; Robinson, 1996, 1997; among others.

A survey of the literature displays that adults have the ability to acquire syntactic structures of a language without intending to, i.e. implicitly. And the accidental exposure may result in abstract representations. Also, it is indicated that accidental or incidental exposure may result in unconscious knowledge of basic word order patterns (Francis et al., 2009). Yet, it is unclear whether there is implicit learning of the syntax of second language. In other words, can incidental exposure to natural language sequences result in unconscious knowledge or not?

There is considerable interest in implicit and explicit knowledge in the field of SLA, but very little is known about the role that implicit knowledge plays in SLA. This could be due to methodological reasons (Williams, 2009). Despite the existence of many theories about the role of implicit and explicit knowledge in SLA (for example, Ellis, 2007; Krashen, 1981), it is hard to determine between them because of the difficulty of determining whether exposure results primarily in implicit or in explicit knowledge. When the intent is to characterize the contribution of implicit learning to SLA, researchers have to be capable of measuring whether the acquired knowledge is implicit or explicit.

In the discussion of measuring implicit and explicit knowledge in SLA, Ellis (2005) states that one of the problems with investigating the implicit and explicit learning is the lack of valid measures of L2 implicit and explicit knowledge.

Ellis raised the question that researchers should be asking: "How do we distinguish whether what individual learners know about language is represented implicitly or explicitly?" (Ellis, 205: 143). He proposed seven ways to distinguish implicit and explicit knowledge so as to arrive at a conceptual account of the two constructs: Awareness, Type of knowledge, Systematicity, Accessibility, Use of L2 knowledge, Self-report, and Learnability.

The key characteristics of implicit and explicit knowledge regarding awareness are that implicit knowledge involves intuitive awareness of linguistic norms, whereas explicit knowledge involves conscious awareness of linguistic forms. With respect to the type of knowledge, implicit knowledge is a procedural knowledge of rules and fragments, but explicit knowledge is a declarative knowledge of grammatical rules and fragments. As for systematicity, implicit knowledge is variable but systematic, whereas explicit knowledge is anomalous and inconsistent. Regarding accessibility, access to implicit knowledge is by means of automatic processing, while access to explicit knowledge is by means of controlled processing. Concerning the use of L2 knowledge, access to implicit knowledge is evident during fluent performance, but access to explicit knowledge is during planning difficulty. Self-report in implicit knowledge is non-verbalizable, but verbalizable in explicit knowledge. Finally, learnability in implicit knowledge is potentially only within a critical period, but it is at any age in explicit knowledge.

Methodologically, Ellis (2005) suggests that operationalization of these constructs for the sake of devising tests to measure them should be based on seven criteria, which are based on but not identical to the seven characteristics already discussed. These seven criteria are: Degree of Awareness, Time Available, Focus of Attention, Systematicity, Certainty, Metalinguistic Knowledge, and Learnability.

Operationalizing the constructs of L2 implicit and explicit knowledge is as follows: For degree of awareness, the response is according to subjective feelings in implicit knowledge, but by using rules in explicit knowledge. With respect to time available, implicit knowledge involves time pressure, whereas explicit knowledge does not involve time pressure. As for focus of attention, in implicit knowledge the primary focus is on meaning, but in explicit knowledge the primary focus is on form. As far as systematicity is concerned, responses are consistent in implicit knowledge, whereas they are variable in explicit knowledge. Regarding certainty, implicit knowledge entails a high degree of certainty in response, but explicit knowledge entails a low degree of certainty in response. Concerning metalinguistic knowledge, it is not required in implicit knowledge, but is encouraged in explicit knowledge. Finally, with respect to learnability, in implicit knowledge early learning is favored, while in explicit knowledge late, form-focused instruction is favoured.

Even though Ellis is not a generativist, his proposed diagnostics for implicit knowledge could be useful. The methodology of our study will be able to assess (i) the systematicity of learners' judgement and (ii) their level of certainty. Highly systematic and clear-cut judgements could be argued to indicate reliance on implicit knowledge. However, it is also possible that variability in the judgements could be induced by competition between grammars (according to the Variational Learning Hypothesis), and it is difficult to distinguish the level of certainty from the effect of markedness in acceptability judgements (as will be discussed in section 5.4.3). The nature of the task used in this study also would suggest that participants tapped into their implicit knowledge. It is, however, debatable whether the need to provide acceptability judgements might have had the opposite effect, i.e. summoning participants' explicit knowledge. This is especially the case because the participants were students in an English department (i.e. learners of English). Therefore, their learning of the relevant structures (including relative clauses and wh-dependencies) might have played a role by providing explicit rules that the participants could have relied on.

3.3 Processing Approaches to SLA

3.3.1 Native Processing of WH-dependencies

Sentence processing is affected by real-time constraints that require decisions to be made on-line. Wh-dependencies and long-distance dependencies have been the focal point for many studies in an attempt to look at what happens at the foot of the chain, i.e., the relationship between a fronted phrase ('filler') and its canonical position ('gap') in on-line processing.

A number of studies have investigated how the structural complexity of unambiguous sentences affects native speakers' difficulty with comprehension. For instance, it has been shown that object relative clauses take longer to process than subject relative clauses. This could be due to the intervention of the subject referent between the head and the foot of object chains (Gibson, 2000) or with the simultaneous retrieval of two referents at the point where the verb is processed (Lewis & Vasishth, 2005).

Structural constraints have been shown to affect on-line processing, and the language processing system has been shown to be sensitive to both structural frequency and structural priming effects. However, it is not clear whether these two types of effects interact during online sentence comprehension, especially for languages that do not have morphological markings (van Gompel, 2013).

Most recent accounts on sentence processing have shown that native speakers rely on the "implicit" knowledge that is stored in their procedural memory, which enables very rapid, unconscious and automatic syntactic processing in the L1 (Frazier, 2013, Clahsen & Felser, 2006). Non-syntactic information tends to also be rapidly integrated during sentence processing (e.g. structural preferences of verbs, animacy, etc.).

A considerable amount of research has also shown that, when processing of filler-gap dependencies, native speakers of English reactivate a displaced wh-constituent at the position of its associated syntactic gap (van Gompel, 2013).

Many processing studies on L1 proved that native speakers are sensitive to extraction of islands during online comprehension (Phillips, 2006). For example, Traxler and Pickering (1996) used plausibility manipulation as a diagnostic for dependency formation in both island and non-island conditions, and found out that English native speakers take relative clause islands into consideration while parsing. And using eye-tracking methodology, Pickering and Traxler (1996) have shown that island constraints are applied immediately during sentence processing. They manipulated the effect of plausibility of a direct object filler in islands and non-islands, and found that filler plausibility only had an effect in the non-island sentences. Similar findings were obtained by McElree and Griffith (1998), on the basis of expectations from verb-based subcategorization.

3.3.2 Language Processing in SLA

The literature regarding L2 learners' syntactic processing points to different results regarding native-likeness. There are studies whose findings indicate that L2 learners' processing is fundamentally native-like, regardless of the characteristics and rules of the L1. This tends to be the case especially in studies that require the participants to do metalinguistic tasks in addition to general reading comprehension (e.g., Juffs & Harrington, 1995).

A substantial number of empirical findings on how native and non-native language processing differ in older L2 speakers are outlined in the literature based on both behavioural and psycholinguistic studies. Opinions, however, vary as to how and why native and non-natives' language processing differ. Clahsen and Felser (2006) propose four main factors affecting the non-native language processing, which are (1) a lack of relevant grammatical knowledge, (2) influence from the learners' L1, (3) cognitive resource limitations, and (4) maturational changes during adolescence (i.e., the critical period).

Language processing is slower in a second language, imposing more costly mechanisms. As a result of decades of research on L1 and L2 processing, psycholinguists recently started to investigate how L2 learners process language in real time. Even though the traditional assumption states that L2 speakers face difficulty with the grammar, more recent research has shown some similarities and differences between L1 and L2 processing. Evidence has been given that L2 processing can become native-like in some linguistic subdomains including certain aspects of grammar. However, L1/L2 processing differences continue in the field of complex syntax even in highly proficient L2 learners. Thus more subtle linguistic distinctions seem to be required to understand the nature of non-native language processing. Therefore, a kind of quantitative difference exists with first language processing (see Roberts, 2013 for an overview).

One position is taken by the advocates of the Shallow Structure Hypothesis (Clahsen & Felser, 2006). They strongly state that qualitative differences exist between L1 and L2 users. These differences are accounted for by their view that "the shallow processing, characteristic of native processing some of the time, is the only type of processing available to L2 users" (Slabakova, 2013, 62).

Shallow processing relies on lexical knowledge, knowledge of the world, pragmatic routines, and basic argument-predicate relations, such as SVO templates. It crucially lacks structural details such as copies (traces) of movement in filler-gap dependencies.

Marinis et al. (2005) have shown that L2ers are not sensitive to intermediate traces in long-distance dependencies. To interpret that, the investigators came up with the argument that L2 learners, when processing long-distance dependencies, are likely to depend on relations between words based on lexical-semantic and argument-predicated schemes. This would mean that the L2ers' processing is meaning-based, not structure-based.

With respect to the Shallow Processing Hypothesis, however, it is unclear what their predictions would be regarding the phenomenon we are studying, as this hypothesis does not seem to be falsifiable.

The opposing position, on the other hand, bears the idea that processing mechanisms in the L2 are fundamentally the same as in the L1. However, the pressure imposed by bilingualism may result in having clear differences between L1 and L2. These processing choices and patterns are likely to transfer from the native language, but they can be defeated. An example that maintains this position is the work done by Dekydtspotter, Dussias, Gabriele, Omaki, Schulz, VanPatten and many others (Dekydtspotter, 2009; Belikova and White, 2009).

Opponents of the Shallow Structure Hypothesis attempt to demonstrate that L2 users show sensitivity to these types of structural representations which are required to measure the sentence meaning online. Examples for the opponents of this hypothesis are Omaki and Schultz (2011), who show in their experimental studies that English native speakers and Spanish learners of English as L2 tend to accept relative clause island constraints.

Dekydstpotter, Schwartz, and Sprouse (2006) argue that:

> "The mere fact that there is an observed non-isomorphy between natives and L2ers does not entail that the natives and the L2ers deploy fundamentally different mechanisms." (Dekydstpotter, Schwartz, and Sprouse 2006: 33)

Dekydtspotter and Miller (2009) investigate the activation of intermediate traces of wh-movement in a priming experiment. They state that the findings of their experiment are interpreted better by weak activation of semantic concepts. This might be due to lexical access difficulties. They warned that research on the processing of wh-dependencies in sentence processing must give full consideration to lexical activation mechanisms. Indefrey (2006) presents further argumentation that goes in an opposite direction to the shallow processing, which is based on the assumption that some of native speakers who are low-educated, low-reading-span or non-proficient may also resolve to use semantic-based processing most of the time.

Pliatsikas and Marinis (2012) argue that the sort of the exposure to language that L2 users receive (i.e., whether it is naturalistic or classroom) has an impact on how they learn their L2. They studied two groups of Greek bilinguals with English as their L2, to test their processing. These two groups were similar in all aspects, yet they differed in whether they had been exposed to English naturalistically or with classroom exposure. They used long-distance dependencies in stimuli similar to Marinis et al.’s (2005) test items, as in (51). It was discovered that learners' processing with a naturalistic exposure to English was similar to that of native speakers. Those with classroom exposure, however, did not process the intermediate traces like native speakers. These findings support the argumentation that linguistic immersion can result in native-like abstract syntactic processing in L2 processing.

(51) The nurse$_i$ [RC who$_i$ the doctor argued [CP <who$_i$> that the rude patient had angered <who$_i$>]] is refusing to work late.

3.3.2.1 The Inhibition Hypothesis

De Cat et al. (2015: 13) propose that "processing effects can be induced by properties of the L1 that cannot be fully inhibited during L2 processing, in spite of acquisition of the target representation."

De Cat et al. (2015) investigated the processing of English noun-noun compounds (NNCs) in order to describe the extent and nature of differences between the performance of English native speakers and non-natives, represented by advanced Spanish and German speakers. The researchers attempted to establish whether the word order of the equivalent structure in the non-native speakers' L1 had an influence on their processing of NNCs in their L2, and whether this influence was due to differences in grammatical representation (i.e., incomplete acquisition of the relevant structure) or processing effects.

The results of this experiment confirmed the importance of the Third Factor (Chomsky, 2005) in L2 research. The researchers propose that processing effects can be caused by features and characteristics from the mother tongue that cannot be fully inhibited during L2 processing, albeit acquiring the target grammar. Detection Theory (Macmillan and Creelman, 2005) expects that "false alarms” (i.e., accepting an illicit structure) will persist when misses (i.e., failing to accept a licit structure) have dropped to non-significant levels" (De Cat et al., 2015: 13).

The Inhibition Hypothesis (De Cat et al., 2015) thus predicts that Behdini L2 learners of English wh-dependencies might over-accept RPs that are L1-driven, even at advanced stages of proficiency, conditioned by difficulties in inhibiting prominent trait of the L1, and that this will continue even when learners' judgements regarding structures with gaps have become close to target-like.

3.3.3 Theoretical Contribution of Processing to the Study

In general, there is indication that bilinguals of lower proficiency face more difficulties with grammatical processing, particularly with revision and handling non-local dependencies (for example, Jackson & Bobb, 2009; Jackson & van Hell, 2011). On the other hand, the more L2 proficiency increases, the less memory capacity is consumed (Service, Simola, Metsanheimo, & Maury, 2002).

Regarding our study which involves reaction time, speed is taken to measure processing. Therefore, speed is taken to index learner's sensitivity to morpho-syntactic information (i.e. whether they process the critical segments at a different speed, depending on whether they feature an RP or gap and whether the wh-chain is in an island condition or in non-island).

Ungrammatical sentences are expected to be processed more slowly than grammatical sentences. If this is observed in Behdini L2 learners (as it is in English native speakers), this would indicate that they use the relevant grammatical knowledge during processing (Roberts, 2013). Speed of processing could therefore be interpreted as an unconscious indicator of the state of the learners' interlanguage. If a link is observed with proficiency, the results would be compatible with an interpretation of the differences between native and non-native processing in terms of quantitative factors rather than a fundamental difference (Roberts, 2013).

With respect to the implicit/explicit knowledge distinction, a discrepancy between judgement and reaction times might be an indication that the L2ers are relying on implicit knowledge to make their judgements. This is more likely to happen as the phenomenon under investigation (relative clauses/RPs and gaps) is taught.

The use of self-paced reading methodology provides a way of tracking the time-course of language processing. It can be used to compare differences in processing cost across conditions or across groups in an experiment. By revealing processing cost, the amount of time spent reading a critical segment could, in principle, highlight differences that the acceptability measure alone cannot provide (Juffs & Rodríguez, 2014).

CHAPTER 4

RESUMPTIVE AND INTRUSIVE PRONOUNS

DATA ANALYSIS: NATIVE SPEAKER JUDGEMENT TASKS

This chapter consists of two main sections: theoretical and analytical. In the theoretical section, three types of resumptive pronouns will be presented: grammatical, apparent, and intrusive. The analytical section addresses a Judgement Elicitation Task that is conducted to establish which types of RPs feature in Behdini and English. It starts with predictions based on the review of the resumption literature, (i.e. the expectations if English features intrusive RPs, the expectations if Behdini features apparent RPs, and the questions regarding variability across structural positions), and then the data will be analysed statistically.

The JET will ascertain whether Behdini features resumptive pronouns or gaps and whether English features intrusive pronouns. The chapter will end with a set of conclusions as to the status of each language, which will be a solid basis to structure and design a set of predictions for the L2 study in the next chapter.

A resumptive pronoun is a pronoun that refers to an antecedent in the sentence and that occupies a site where a gap would be expected, “a pronominal variable that appears in the position from which movement is proposed to occur” (McKee & McDaniel, 2001: 114).

The majority of world languages use resumptive pronouns instead of gaps or traces in relative clauses (Morneau, 1994). The following is an example of an RP in Behdini (the RP is in bold):

(52) Min tiveng-a ku Adem-î **ew** kirî dît.
I gun-EZ.F Comp Adam-DIR **RP** buy.PAST see.PAST
‘I saw the gun that Adam bought **it**.’

English seems to be an exception. A sentence like (53a) is considered grammatical for most native English speakers, but (53b) is not accepted because it is an example of an object relative RP; RPs are considered ungrammatical in English (This point will be qualified below).

(53) a. These are the potatoes that Ted prepared __.

b. *These are the potatoes that Ted prepared them. (Keffala & Goodall, 2011)

4.1. Types of RPs

This section presents the theoretical accounts of three types of RPs: grammatical, apparent, and intrusive. Many scholars distinguish two main types of RPs. Among them are Alexopoulou (2010) and Sells (1984) who point out that RPs can be (1) apparent or (2) intrusive. There are a number of different properties between the two types, as will be discussed in the subsequent sections. Some scholars (such as Aoun et al., 2001) distinguish yet another type of RP, namely true resumptives, which will also be discussed below.

4.1.1 True resumption

True resumption occurs when a pronoun or an epithet phrase is related to an A-bar antecedent via binding, and this is unlike apparent resumption, where the pronoun or the epithet phrase is related to its A-bar antecedent via movement (Aoun et al., 2001).

A reliable diagnostic between true resumption and apparent resumption is that true resumptive pronouns do not show reconstruction, while apparent resumptives allow reconstruction (Aoun et al., 2001). In the interpretation of the gap position, reconstruction is the interaction between movement (dislocation, topicalization, interrogation, relativization) and interpretation procedures such as binding conditions (Guilliot & Malkawi, 2006).

Consider the following examples from Lebanese Arabic (quoted from Aoun et al., 2001) to account for the absence of reconstruction in true resumptives. If there is no island as in (54a), the ‘reconstructed’ functional reading is allowed (a *different* *student* for *each teacher*), i.e. interpretation as if occupying the RP position of the antecedent:

(54) a. [təlmiiz-a1 l-kəsleen]2 ma baddna nXabbir wala mʕallme1 ʔənno
student-her the-bad Neg want-1p tell-1p no teacher that
huwwe2 zaʕbar b-l-faèi¸s
he cheated-3sm in-the-exam
'Her1 bad student2, we don't want to tell any teacher1 that he2 cheated on the exam.'

Whereas this reconstructed functional reading is not available anymore when a weak or strong island intervenes, for instance:

(b) *[təlmiiz-a1 l-kəsleen]2 ma badda taʕrif wala mʕallme1 lee l-
student-her the-bad Neg want.3fs know.3fs no teacher why the-
mudiira Saèat_it-o2 mn l-madrase
principal expelled-him from the-school
'Her1 bad student2, no teacher1 wants to know why the principal expelled him2 from the school.'

(c) *[təlmiiz-a1 l-kəsleen]2 ma èkiina maʕ wala mʕallme1 ʔable-ma(ha)-
student-her the-bad Neg talked-1p with no teacher before (this)-
l-majduub2 yuusal
the-idiot arrive-3sm
'Her1 bad student2 we didn't talk to any teacher1 before this idiot2 arrived.'

Based on the contrast above, Aoun et al. (2001) point out that resumptive elements which appear inside islands (weak island in (55b), and strong island in (55c)) behave differently from resumptive elements which are not inside islands as in (55a). They propose the terms 'true resumption' and 'apparent resumption' respectively for these two cases. Apparent resumption is the type of RP that involves movement.

4.1.2 Apparent resumption

In this study I will hypothesize that Behdini is to be classified as having this second type of resumption, i.e. apparent resumption (see 4.4). The properties of this type of resumption are as follows:

1- Apparent resumptives can freely alternate with gaps in most long-distance dependencies, and such alternations are not associated with any discernible interpretive effects (McCloskey, 2001: 93).

2- Apparent resumptives must be used in contexts where the use of a gap is impossible (such as syntactic islands), rendering the following fully grammatical example in Irish:

(56) na hamhráin sin nach bhfuil fhios againn [CP cé a chum *(iad)]
the.PL songs those C..NEG is knowledge at-us who C composed RP
'the songs that we don't know who composed them' (McCloskey, 2006)

3- The subject gap cannot be replaced by a resumptive element in the highest subject position of relative clauses as a direct consequence of economy principles. The following Hebrew sentence is one example of this.

(57) ha-ʔiš [še (*hu) ʔohev ʔet-Rina]
DET-man COMP RP loves ACC-Rina
'the man who loves Rina' (Shlonsky, 1992: 6)

4- Apparent resumptives can be bound by a quantificational antecedent (Chao and Sells, 1983; Sharvit, 1999; Hendrick, 2005). According to Wise (2004), quantification is a limitation imposed on the variables of a proposition by the quantifiers 'some,' 'all' or 'no.' It refers to an operator that binds a variable ranging over a domain of discourse. The following example from Arabic illustrates this:

(58) Kul bint karim gal ?in- ha /-ha hi raH tinJaH
Every girl Karim said.3sm that-Cl/-Cl she will success 3sf
'Every girl, Karim said that she will pass' (Aoun et al., 2001)

4.1.3 Intrusive pronouns

This is another type of resumption in which, unlike true and apparent resumption, the use of RPs is not fully grammatical. The properties of intrusive pronouns are going to be explained in general in this section and they will be illustrated with English.

Intrusive pronouns are to be distinguished from grammatical resumptives. Intrusive resumption generally has marginal acceptability. For instance, (59b) is much degraded as compared to (59a).

(59) a. This is the girl that John likes __. (Gap)

b. ?? This is the girl that John likes **her**. (RP)

However, grammaticized (i.e. true or apparent) resumption is fully acceptable and can be in free variation with gaps or even obligatory (Beltrama, 2013). Therefore, as opposed to languages with apparent resumption, where such resumptive pronominals are in free variation with gaps and are grammatically unmarked (Sells, 1987; Sharvit, 1999; McCloskey, 2002), English resumptives lie at the margins of grammar. Referred to as ‘intrusive’ resumptive pronouns, they are often regarded as a ‘last resort’ device to preserve the grammaticality of the dependency (Ross, 1967; Sells, 1984). Thus Sells (1984) draws a distinction between grammatical resumption and so-called intrusive resumption. Contrary to grammatical resumption, intrusive resumption is not licensed by the grammar. Rather, it arises as a “last resort” strategy where a pronominal appears in place of an illicit gap (trace) (Ross, 1967; Sells, 1987; Kroch, 1981). The illicit gap may be due to an empty category principle (ECP) violation as in (60). ECP is a syntactic constraint that requires traces to be properly governed (Haegeman, 1994: 442).

(60) a. I just saw a girl who Long John’s claim that she was a Venusian made all the headlines.

b. The only kind of car which I can never seem to get its carburetor adjusted right is them Stanley Steamers. (Cited in Sells, 1984 from Ross, 1967, 6.154a,e)

Or it may be due to an island violation, apart from ECP violation, as in:

(61) a. I’d like to meet the linguist that Mary couldn’t remember if she had seen (him) before.

b. Which of the linguists do you think that if Mary marries (him) then everyone will be happy? (From Sells, 1987, 9a,10a)

(62) the guy who they don't know whether he wants to come or not. (From Kayne, 1981, 83a cited in Kroch, 1981)

Therefore, English resumption is an example of intrusive pronouns in which the use of RPs is not fully grammatical. Unlike the apparent resumption languages, English does not strictly obey the highest subject restriction for example:

(63) a. I have this friend who *she* does all the platters. (Prince, 1990)

b. You know, it's, uh, one of those movies that *it*'s not a great movie

c. She got a couch at Sears that it was on sale (Cann et al., 2004, ex. (10))

As shown in the above examples, the pronoun can appear in the highest subject position of a relative clause. With respect to raw frequency, resumptives appear in highest-subject position more frequently than in embedded-subject positions (Heestand et al., 2011).

And as opposed to apparent resumptives, English intrusive pronouns cannot be bound by quantificational antecedents (Sells, 1984: 453; Erteschik-Shir, 1992: 92), for instance:

(64) a. Which truck$_i$ does no driver$_k$ believe _$_i$ will get him$_k$ across the country?— The one he$_k$ hires from Ryder.

b. *Which truck$_i$ does no driver$_k$ believe it$_i$ will get him$_k$ across the country?— The one he$_k$ hires from Ryder (Chao and Sells, 1983: 51)

In conclusion, intrusive pronouns occur in certain contexts in which movement is not possible and the resumptive element is related to its antecedent anaphorically (Sells, 1984). As far as apparent resumption is concerned, the pronoun or epithet phrase is connected to its antecedent via movement (Demirdache, 1991; Aoun and Choueiri, 1996; Aoun et al., 2001; Varlokosta and Armon-Lotem, 1998). Unlike intrusive resumption, only apparent resumption displays reconstruction effects for scope and binding, and these are certainly typical features of movement.

As explained above, intrusive pronouns are pronouns that can be used in languages that do not have a resumptive pronoun construction, to rescue sentences which would otherwise be ungrammatical because of an island violation. The phenomenon of intrusive-resumption has been of considerable interest in theoretical and experimental syntax. In this type of resumption it is usually accounted for the asymmetry between the status of RPs in gaps and in islands/complex dependencies.

Intrusive RPs are not grammatically licensed, but can be used as a last-resort strategy to improve the production/comprehension of long distance dependencies in environments such as islands and long dependencies, where gaps would be particularly hard to process (Kroch, 1981).

Shlonsky (1992) proposes that apparent RPs are a last resort strategy only used when movement is preempted. In more modern terms (Chomsky, 1995), this means that a derivation with an RP will only be licit if the derivation with movement does not converge. The non-movement option (where the RP is present) will only be applied if movement is blocked by some constraint. In this case, both the RP and its binder are inserted into their surface positions at D-structure. Resumption is, thus, viewed as the consequence of the impossibility of movement.

Shlonsky hypothesizes that intrusive RPs are never freely generated, with their distribution always regulated by last resort considerations. If this is the case, then the appearance of RPs even in English should be restricted to cases where a gap is ruled out. As we can observe in the sentences below, this is indeed the case:

(65) a. the boy that Mary likes (*him)

b. the book that I wondered if I would get *(it) in the mail

However, the literature on Intrusive Pronouns in English reveal that contrary to the theoretical predictions, experimental studies reveal no interaction between

RPs and island effects in English (Ferrera et al., 2005; Alexopoulou & Keller, 2007; Heestand et al., 2011; Keffala & Goodall, 2011; Han et al., 2012; and Polesky et al., 2013). Therefore, the JET in this study will test whether the reality of this effect can be demonstrated (i.e. that RPs rescue island violations in English).

4.2 Diagnostics Summary

This section summarizes the diagnostics of the three types of resumptives (true, apparent, and intrusive). Table 4-1 lists the properties of the three types of RPs.

Table 4-1. Properties of True Resumptives, Apparent Resumptives, and Intrusive Pronouns

Diagnostic	**True RP**	**Apparent RP**	**Intrusive RP**
True optionality between RP or gap	No	Yes	No
In islands	Obligatory	Obligatory	Partly rescue the island
Reconstruction	No	Yes	No
Binding or movement	Related to their A-bar antecedents via binding.	Related to their A-bar antecedents via movement.	Used to rescue the ungrammatical structure due to an island violation.
Quantificational antecedent		Can be bound by quantificational antecedent.	Cannot be bound by quantificational antecedent.
Highest subject restriction		Obeys the highest subject restriction.	Does not strictly obey the highest subject restriction.

Based on Table 4-1 the specific diagnostics of the three types of RPs are going to be summarised. Diagnostics of true RPs are listed as follows:

- There is no true optionality between true RPs and gaps (see 55a).
- True RPs are obligatory in islands (see 55c).
- True RPs show no reconstruction (see 55b).
- True RPs are related to their A-bar antecedents via binding.

The diagnostics of apparent RPs are listed below:

- There is true optionality between apparent RPs and gaps.
- Apparent RPs are obligatory in islands (see 56).
- Apparent RPs show reconstruction, as in (66) below.

(66) La photo de sa*1* classe, tu es fâché parce que chaque prof*1* l-a déchirée.
The picture of his class you are furious because that each teacher it-has torn
'The picture of his*1* class, you are furious because each teacher*1* tore it.'
(Guilliot & Malkawi, 2012)

- Apparent RPs are related to their A-bar antecedents via movement.
- Apparent RPs can be bound by quantificational antecedent (see 58).
- Apparent RPs obey the highest subject restriction meaning that a subject gap cannot be replaced by a resumptive element (see 56).

The diagnostics of intrusive pronouns are listed below:

- There is no true optionality between intrusive RPs and gaps (see 59a and 59b).
- Intrusive RPs appear in islands marginally to rescue their grammaticality (see 62a, b, and 63).
- Intrusive RPs cannot be bound by a quantificational antecedent (see 65a and b).
- Intrusive RPs do not strictly obey the highest subject restriction meaning that RPs might appear in subject positions (see 64a, b, and c).

4.3 Cross-linguistic variation in the distribution of RPs

This section will address the cross-linguistic variation within the types of RPs mentioned above. Grolla (2005) argues that the distribution of RPs across languages is not uniform. She highlights that there is a variation in the distribution of RPs even among the true and apparent resumptive languages. Thus RPs are not allowed to appear everywhere indistinctively. Language-specific constraints may require RPs in some positions or disallow them in others. These language specific constraints were clarified on the basis of four positions in restrictive relative clauses in Grolla's test for RPs across adult languages to account for the differences observed across languages, and these four positions are highest subject position, direct object, NP-internal, and oblique complements. English is one of the languages that seems to make a restricted distribution of RPs as gaps appear obligatorily all over these four positions in non-island conditions.

Grolla investigated the distribution of RPs in Palestinian Arabic (PA), Hebrew, Brazilian Portuguese (BP), and English. Table 4-2 is a reproduction of the chart presented by Grolla for observing the distribution of RPs and gaps in these four languages.

Table 4-2. Distribution of RPs across languages

Position	Palestinian Arabic	Hebrew	Brazilian Portuguese	English
Subject	Gap	Gap	Gap	Gap
DO	RP	Gap/RP	Gap/RP	Gap
Emb. S	RP	Gap/RP	Gap/RP	Gap
Oblique	RP	RP	RP	Gap

Grolla adopts Shlonsky's suggestion that intrusive RPs are a last resort strategy only used when movement is preempted. Grolla (2015) adds cross-linguistic variation according to the RP's position which forms a coherent account with the typology of RPs. She finds that these four languages have different distributions of RPs in restrictive relative clauses. As indicated in Table 4-2, in Palestinian Arabic RPs are obligatory everywhere, except in the highest subject position, in which gaps are obligatory. In Hebrew and Brazilian Portuguese, RPs are optional in direct object and NP-internal positions, and obligatory in the oblique argument. However, they are banned from the subject position. As for English, gaps are used obligatorily in all the four positions in restricted relative clauses.

To sum up, judging from the above arguments there is a clear cross-linguistic variation as to the distribution of RPs and gaps in various languages. The discussion of differences observed across various languages with regard to the distribution of RPs and gaps can also be found in other works (e.g. from Rouveret, 2011).

4.4 Behdini: preliminary observations

This section is based on my intuition, and its purpose is to motivate the hypothesis of the study. The type of RP will be established based on the diagnostics in Table 4-1, and further restrictions depending on the syntactic position of the RP or gap will be investigated based on Grolla's insights.

To start with, in Behdini non-islands a ‘reconstructed’ functional reading is allowed, as in (67), (that is, a *different student* for *each teacher*), which is a main diagnostic of apparent RPs:

(67) Qutabi-yê wê yê çepel, me ne-vêt bêjîn-e çi mamostaya ku wî
student-EZ.M her EZ.M bad we NEG-want tell-to any teachers that he
fêl di ezmûn-ê da kir.
cheating in exam-OBL LOC do.PAST
‘Her$_1$ bad student$_2$, we don’t want to tell any teacher$_1$ that he$_2$ cheated on the exam.'

The examples below provide a preliminary estimation as to the applicability to Behdini of the other diagnostic tests listed in section 4.1.2.

1. Apparent resumptives can freely alternate with gaps in most long-distance dependencies, as in (68) which is an example for a long-distance structure, and there is no difference in interpretation between 68a and b. (69) is an example with a wh-question, in which there is no difference in interpretation between 69a (gap) and 69b (RP).

(68) a. Ew mamosta-ya ku ji te ve Conî got min digel __ axivtî.
Det teacher-EZ.F Com you thought John say.PAST I.OBL with talk.PAST
'the teacher whom you thought John said I talked to __'

b. Ew mamosta-ya ku ji te ve Conî got min digel wê axivtî.
Det teacher-EZ.F Com you thought John say.PAST I with her talk.PAST
'the teacher whom you thought John said I talked to her'

(69) a. Kîj kiçik di pol-ê da Azad-î ḧez liser __ heye?
Which girl in class-DIR LOC Azad-OBL liking on have
'Which girl in the class does Azad like __?'

b. Kîj kiçik di pol-ê da Azad-î ḧez liser wê heye?
Which girl in class-DIR LOC Azad-OBL liking on her have
'Which girl in the class does Azad like her?'

2. Apparent resumptives must be used in contexts where the use of a gap is impossible, such as syntactic islands as in (70a).

(70) a. Ew sitiran-ên em ni-zanîn kî wan vehand-în.
Det song-EZ.P we.OBL NEG-know who them compose.PAST-3PL
'the songs that we don't know who composed them'

However, it looks like RPs in islands are marked rather than fully grammatical because 70b illustrates an island without the RP and shows that the use of a gap is not impossible. This could be due to the fact that Behdini is not very sensitive to the interaction of island effects and resumption as will be discussed in (4.5.7.2.3.1):

b. Ew sitiran-ên em ni-zanîn kî __ vehand-în.
Det song-EZ.P we.OBL NEG-know who __ compose.PAST-3PL
'the songs that we don't know who composed __'

3. The subject gap cannot be replaced by a resumptive element in the highest subject position of relative clauses. In other words, resumptives cannot appear in subject dependencies, as shown in 71, and only gaps are allowed.

(71) Ew zelam-ê (*ew) ḧez ji Rîna-yê di-ke-t
Det man-EZ.M (RP) love to Rina-DIR PRST-do-3SG
'the man who (he) loves Rina'

4. RPs can be bound by a quantificational antecedent. This means that RPs can be used as a reference to an antecedent that is a quantifier (such as 'all,' 'any,' 'every,' 'some').

(72) a. Kîj filim hemî kes nav-ê wî îna?
Which movie every person name-EZ.M it bring.PAST
'Which movie did every person name it?'

b. Her kiçk-ek Kerîmî got ku ew dê biserkevît.
Every girl-one Karim said Comp she will pass
'Every girl, Karim said that she will pass'

Based on the data above, it can be hypothesized that Behdini is an apparent resumptive language. However, the examples above suggest that Behdini RPs appear only optionally, not obligatorily, in structures where normally the use of a gap is impossible (such as syntactic islands). In the spirit of Grolla (2005), additional syntactic restrictions will need to be investigated to elucidate this question.

As a starting point, the examples below illustrate the use of RPs and gaps in the four syntactic positions identified by Grolla (subject, object, NP-internal, and oblique complement). Note that relative clauses in Behdini are introduced by the complementizer *ku*.

(73) a. Ew zelam-ê ku (*ew) ḧez ji Mariya-yê di-ke-t. (Subject)
Det man-EZ.M Com (he) love to Maria-DIR PRST-do-3SG
'the man who (he) loves Maria'

b. Ew zelam-ê ku min (ew) dît-î. (DO)
Det man-EZ.M Com I:OBL (him) see.PAST-3SG
'the man that I saw (him)'

c. Ew zelam-ê ku min jin-a wî dît-î. (NP-internal)
Det man-EZ.M Com I:OBL wife-EZ.F him see.PAST-3SG
'the man that I saw the wife of him.'

d. *Tu kî jin-a __ di-nyas-î?
You who wife-EZ.F PRST-know-3SG
'who do you know the wife of ___?)'

(73d) is a variant to (73c) with a gap.

e. Ew zelam-ê ku min digel (wî) axivt-î. (Oblique complement)
Det man-EZ.M Com I:OBL with (him) talk.PAST-3SG
'the man that I talked with (him)'

Table 4-3 shows the hypothesized distribution of RPs in English and Behdini relative clauses:

Table 4-3. The distribution of RPs in English and Behdini relative clauses across syntactic positions

Position	**English**	**Behdini**
Subject (highest subject position)	Gap	Gap
DO (Direct Object)	Gap	Gap/RP
NP-internal position	Gap	RP
Oblique complement	Gap	Gap/RP

As shown in Table 4-3, RPs in Behdini are possible everywhere in restrictive relative clauses except for highest subject position. They are obligatory in NP-internal (possessive) clauses and optional in the direct object and oblique complement positions. RPs do not seem to be obligatory in argument positions in Behdini.

The presence of gaps in highest subject position can be speculated to be analysed as a direct consequence of economy principles: since nothing prohibits short movement from spec,IP to spec,CP, so RPs will not be allowed in this position (Grolla, 2005).

The assumption that RPs in direct object position are optional could be due to the fact that Spec,CP in Behdini can be an A-position or an A bar-position. When Spec,CP is an A bar-position, we have a derivation in which a null operator moves overtly from direct object position to Spec,CP. When Spec,CP is an A-position, the null operator is base-generated in Spec,CP and a resumptive pronoun appears as the complement of the verb (Grolla, 2005).

As for NP-internal positions, according to Shlonsky (1992), the mandatory presence of an RP is due to the Empty Category Principle (ECP). Extraction of elements internal to NP is ruled out in Behdini because one cannot extract anything out of the NP *jina wî* ‘wife of him,’ and this fact is ascribed to ECP-related reasons. It is to be noted that ‘Whose wife’ in English is expressed as an NP, i.e., ‘wife of him’ in Behdini. To confirm that extraction of elements internal to NP is ruled out, a variant with a gap as (73.d), which is **Tu kî jn-a __ dinyasî?* “Who do you like the wife of__?” is completely ungrammatical in Behdini.

The optional presence of RPs in oblique complement positions is due to the fact that ECP does not rule out any construction where the preposition has a gap as its complement. That is ECP does not have any effects on the preposition. So this allows for the preposition to be followed by a gap or by an RP. So gaps seem never to be obligatory in any structure in Behdini except in the highest subject position, whereas in English RPs are never obligatory in any structure.

In conclusion, the judgement elicitation task (in the following section) will have to determine which option in relative clauses is more marked at each position in Behdini: gap or RP and how this is affected by islands.

4.5 Data Analysis: Native Speaker Judgement Elicitation Tasks

This chapter presents a judgement elicitation task as an attempt to establish the type of language that Behdini and English fit into with respect to resumption. The results of this experiment will help pin down and structure the predictions and hypotheses for the second language acquisition (SLA) study in the following chapter.

The English part of the analysis will attempt to confirm what the literature says that English instantiates intrusive pronouns. This means that resumptives are allowed to be used in island conditions to rescue the otherwise ungrammatical structure due to island violation and possibly also to alleviate processing when it is heavy. Regarding Behdini, resumption has not yet been studied in that way. So the analysis will attempt to show what type of resumption language Behdini is. As mentioned in 4.4, Behdini is predicted to be an apparent resumptive language.

This study includes a JET that has been performed on the sentences in accusative (non-past tense) and ergative (past tense) clauses based on three factors: nature of the element in the gap position, structural position of the gap, and syntactic configuration of filler-gap dependencies including both island and non-island conditions.

As far as the effect of accusative and ergative contexts on RPs in Behdini are concerned, this experiment also aims at investigating whether verbal agreement in Behdini licenses RP omission. Recall from Chapter 2 that the verb agrees with A subjects in accusative clauses and with S subjects and O in ergative clauses. This might license RP omission in those structures, akin to what has been proposed for null subjects in a number of studies (e.g. Barbosa, 1995; Crysmann, 2010; Quitaf, 2011; and Polinsky et al., 2012).

Based on this verbal agreement, it is expected that RPs in ergative object (as in 74a) and accusative subject clauses (as in 74b) will be rated highly and equally due to the effect of ergative and accusative case marking on arguments based on their verbal agreement (accusative subjects agree with the verb, and ergative objects agree with the verb; both of these agreement paradigms are realized morphologically).

(74) a. Eve ew zelam-e ew-ê ku min **ew** dît-î.
Det that man-COP EZ.M Comp I **him** see.PAST-3SG
'This is the man that I saw **him**.'

b. Eve ew zelam-e ew-ê ku **ew** te di-bîn-ît.
Det that man-COP EZ.M Comp **he** you PRST-see-2SG
'This is the man that **he** sees you.'

The object resumptive pronoun *ew* in 74a is hypothesized to be more acceptable because it is in ergative structure in which the verbal agreement is with the object. This might make the presence of RPs more acceptable.

In 74b, on the other hand, the subject accusative resumptive pronoun *ew* is expected to be licensed because it lies in an accusative structure, in which the agreement is between verb and subject.

This JET will specifically help establish whether Behdini RPs are obligatory in argument position (based on Grolla's (2005) test 4.3), and in case of optionality which option is more marked in Behdini argument position: gap or RP. This will determine the extent of the difference between Behdini and English regarding RPs in object and subject positions.

4.5.1 Research questions summary

The specific questions that will lead the analysis are listed below with the hypotheses following each question where possible:

1. What are the types of RPs featured in Behdini and English?

Hypotheses: intrusive in English (Sells, 1984; Aoun & Li, 2004); apparent RPs in Behdini (see 4.4).

2. What predicts the presence of RPs in Behdini and English, in addition to their general typological properties? In particular:

2.1 Are RPs used to rescue island violations in both languages?

Hypotheses: In English islands are used to rescue island violations (Sells, 1987; Kroch, 1981). In Behdini, on the other hand, RPs do not necessarily rescue island violations as Behdini is less sensitive to the interaction of RPs and islands than English (see 4.4).

2.2 Are RPs allowed in relative clauses to the same extent in both languages?

Hypothesis: More RPs are used in Behdini than in English relative clauses.

2.3 Are there restrictions on the use of RPs in certain structural positions in Behdini?

Hypothesis: In Behdini, possessive structural positions require the use of RPs obligatorily and gaps are not acceptable (see 4.4 as in 95c)

2.4 Will verbal agreement in Behdini (based on accusative case marking for subjects and ergative case marking for objects) license RP omission?

Hypothesis: Verbal agreement will function as RPs and this will have an impact on the distribution of RPs in accusative subject and ergative object dependencies (Barbosa, 1995; Crysmann, 2010; Quitaf, 2011; and Polinsky et al., 2012)

By ascertaining the status and distribution of RPs in Behdini and English, we will be able to determine (i) the possible L1 influence on Behdini learners of English, and (ii) the extent of variability in the target grammar.

4.5.2 Design

English and Behdini test sentences are fully equivalent, i.e. one translated from the other. All the sentences in this JET are tested with and without RPs to determine which structures allow the use of RPs and gaps both in Behdini and English.

The variables used in this study are described below followed by an explanation of the coding system.

(A) Dependent variable

The dependent variable in this experiment is the acceptability measured on a four-point rating scale, which will be described below.

(B) Predictor variables

1- Chain foot: gap vs. resumptive. *Chain foot* refers to the position at the foot of the wh-chain (or dependency), which is filled either by a gap or by a resumptive pronoun. This is the main variable in the study, showing if the trace of the clause contains a gap or a resumptive pronoun. This variable is the most important one in the study as it is essential to investigate all the research questions raised in this study. The sentences in (75) provide examples for this variable; (75a) illustrates a gap and (75b) illustrates a resumptive.

(75) a. This is the man that I see __.

b. *This is the man that I see him.

2- Island: non-island vs. island. (76a) is an example for non-islands and (76b) is an example for an island.

(76) a. Which building have you seen?

b. *Which building have you seen [who was targeting __]?

3- Grammatical role: subject, object, oblique, and possessive. Sentences in (77) show examples for these four arguments with RPs, respectively.

(77) a. *This is the man that **he** loves your neighbour.

b. *This is the man that I see **him**.

c. *This is the man that I walk with **him**.

d. *This is the man that I see the wife of **him**.

4- Argument structure: accusative vs. ergative. This is used to investigate the acceptance rates in the two structures of Behdini: accusativity (operationalized as non-past tense as in 78a) and ergativity (operationalized as past tense as in 78b). For English, the argument structure is referred to as *tense* and the conditions correspond to non-past and past. This variable will show if there are any significant differences between ergative (past) and accusative (non-past) structures over the dependencies tested in this study.

(78) a. Eve ew dixtor-e ew-ê ku dê çareserî-ya te ket.
Det that doctor-COP EZ.M Comp will treatment-EZ.F you make
'This is the doctor that will treat you.'

b. Eve ew dixtor-e ew-ê ku çareserî-ya te kir.
Det that doctor-COP EZ.M Comp treatment-EZ.F you make.PAST
'This is the doctor that treated you.'

5- Movement type: The nature of the chain between the pronoun and its antecedent is either a wh-question (as in 79a) or a relative clause in a presentative structure (as in 79b).

(79) a. Which student are you furious because the principal expelled him?

b. These are the persons that they saved the kid.

6- Origin clause: This corresponds to the types of clause containing the gap or RP and the levels of this variable represent the four types: relative (as in 80a), adjunct (as in 80b), sentential subject (as in 80c), and wh-clause (as in 80d). This variable will show if there is any variance in island types as to their interaction with resumptives both in English and in Behdini.

(80) a. This is the man [that the policeman who arrests him] saves the president's life.

b. This is the defendant that you will be surprised [if you learn that they will send her to jail].

c. Who do you think that [to nominate him] would be a disaster?

d. Which building have you seen [who was targeting it]?

4.5.3 Materials

Four examples have been used for each structure to be tested, to try to limit item-specific effects. There are 32 mother sentences, with each "mother" sentence having four variants by fully crossing chain foot (including gap and RP) and tense (including past and non-past), as shown in (81) below (the full materials are shown in Appendix 2):

(81) a. These are the houses that I will burn. (Gap non-past tense)

b. *These are the houses that I will burn them. (RP non-past tense)

c. These are the houses that I burnt. (Gap past tense)

d. *These are the houses that I burnt them. (RP past tense)

4.5.4 Data distribution

Test items were quasi-literally translated from English to Behdini. They are based on 32 “mother sentences,” each presented in four variants (+/-RP, +/-[past]), meaning that each mother sentence was presented once with resumptive and once with gap, and once with past and once with non-past.

All participants saw all the sentences in their language, with a distance of 20 test items between repetitions of any mother sentence. The total number of trials was 180 (with the inclusion of 1/5 distractors); distractors have been inserted so that participants cannot have a chance to formulate a systematic answer. Additionally, the normal order of the sentences was randomized. It is to be noted that I am aware that the low proportion of distractors is a limitation of this study, but it was due to the very high number of critical items.

Distribution of the test items is shown in Tables 4-4 and 4-5 grouped under type of clause followed by examples for each mother sentence. Each item appeared once with an RP and once with a gap, and once in past and once in non-past tense.

Table 4-4: Distribution of data based on mother sentences used for each type in non-islands (Each mother sentence is presented once with RP, once with gap, once in past, and once in non-past)

Non-island Relative clauses	**Number of mother sentences**
Possessive (as in 82)	4
Subject (as in 83)	4
Object (as in 84)	4
Oblique (as in 85)	4

(82) a. This is the man that I see the wife of him.
b. This is the girl that you see the mobile of her.
c. These are the houses that I repair the doors of them.
d. This is the car that you will sell the engine of it.

(83) a. This is the man that he will love your neighbour.
b. This is the girl that she will marry the governor.
c. These are the persons that they will save the kid.
d. This is the doctor that he treats you.

(84) a. This is the car that my brother will sell it.
b. This is the man that I see him.
c. This is the girl that Ali will marry her.
d. These are the houses that I will burn them.

(85) a. This is the man that I talk with him.
b. This is the girl that I walk with her.
c. These are the people that I work against them.
d. This is the lawyer that I work for him.

Table 4-5: Distribution of data based on mother sentences used for each type in object islands (Each mother sentence is presented once with RP, once with gap, once in past, and once in non-past)

Origin clause	**No. of mother sentences**	**Movement type**
Adjunct (as in 86.b, c, d)	3	Presentative
Relative (as in 87)	3	
Sentential subject (as in 88.b, c)	2	
Wh-clause (as in 89)	3	Long wh-Q
Adjunct (as in 86.a)	1	
Sentential subject (as in 88.a)	1	

(86) a. This is the defendant$_i$ [$_{CP}$that you will be surprised [$_{CP}$if you learn [$_{CP}$that they will send her$_i$ to jail]]].
b. I will interview the candidate$_i$ [$_{CP}$that most people will be disappointed [$_{CP}$if people vote for him$_i$]].
c. Which student$_i$ will you be furious [$_{CP}$if the principal would expel him$_i$]?
d. This is the movie$_i$ [$_{CP}$that I say [$_{CP}$whenever you see it$_i$] [$_{CP}$you will not be bored]].

(87) a. These are the jewels$_i$ [$_{CP}$that I know [$_{DP}$the man [$_{CP}$who sends them$_i$ to my mother]]].
b. This is the man$_i$ [$_{CP}$that [$_{DP}$the policeman [$_{CP}$who arrests him$_i$]] saves the president's life].
c. It is these shoes$_i$ that [$_{CP}$I know [$_{DP}$the person [$_{CP}$who gives them$_i$ to you]]].

(88) a. That is the girl$_i$ [$_{CP}$that Peter says [$_{CP}$that [$_{CP}$how much Lars loves her$_i$] will determine the final decision]].
b. Who$_i$ do you think [$_{CP}$that [$_{CP}$to nominate him$_i$] would be a disaster]?
c. This is the car$_i$ [$_{CP}$that [$_{DP}$whatever money you would offer for it$_i$] will not be enough].

(89) a. Which$_i$ dog do you know [$_{CP}$who buys it$_i$ illegally]?
b. Which$_i$ building have you seen [$_{CP}$who was targeting it$_i$]?
c. Who$_i$ does Layla see [$_{CP}$what the government gave him$_i$?

All the items are listed in Appendices 2, 3, and 4 in which the four versions of each mother sentence are presented in this order: the first sentence is accusative RP (+[RP]/-[past]), the second is ergative RP (+[RP]/-[past]), the third is accusative gap (-[RP]/-[past]), and the fourth is ergative gap (-[RP]/+[past]).

(1) Relative clauses

See Appendix 3 for the list of all test items in relative clauses.

(2) Non-islands

See Appendix 4 for the list of all test items in non-islands.

(3) Islands

See Appendix 5 for the list of all test items in islands.

4.5.5 Rating Scale

To increase the test's reliability, I have avoided the traditional grammaticality judgement tests, in which the structure of the test format is a list of dichotomous yes-no questions. The main reason behind avoiding such a type of grammaticality judgement test is that the responses comprise a high risk of chance-level errors especially with those structures in which the informants are not sure about their judgements and thus might resort to decisions based on guessing and because dichotomous responses do not allow for fine-grained judgements. For this reason I have followed a multiple-choice test type for grammaticality judgements based on a 4-point rating scale. This method allows the informants to rate sentences as marked rather than ungrammatical. This experiment is an example of experiments showing that syntactic acceptability is a gradient rather than a binary concept and it has been adopted by many researchers (such as Keller, 2000; Sprouse, 2007; and Clark et al., 2013).

Thus each sentence was tested according to the following four response categories:

A. I could say this sentence exactly as it is.
B. This sentence is fine but complicated to understand.
C. I could say this sentence in a particular context.
D. I don't think anybody could say this sentence.

The first two options are clearly "grammatical." However, option B allows for processing considerations and it is required for testing the items in which the RP is used to rescue an island violation. Recall that resumptive pronouns have been described as an island rescuing device in English and some other languages. The last option is clearly "ungrammatical." As for the interpretation of the third option, this category can be argued to capture markedness that is not due to processing load.

In general, markedness involves a certain type of asymmetry relationship between the elements of linguistic structures. In a marked/unmarked relation, one term of the asymmetry is the broader, dominant one. The dominant default or minimum effort form is known as the 'unmarked' term and the other, secondary one is the 'marked' term. An example that clarifies the idea of linguistic markedness is a set of linguistic categories such as singular and plural. There is often a sense that one category is simpler or more basic than the other. Singular is referred to as unmarked, and is often thought of as a default, while plural is referred to as marked.

As for the interaction of the notion of markedness with grammaticality judgement tasks, a common strategy is to attribute gradience to “external” factors. This has been supported by Chomsky himself (Chomsky, 1964, 1965). It allows the researcher to distinguish degrees of grammaticalness by the type of grammatical rule that has been violated. A violation of a semantic selectional rule causes weaker ungrammaticality than a violation of a syntactic subcategorisation rule (Vogel, 2005).

In this study, it is assumed that contextual markedness, i.e. markedness for discourse effects, can be taken into account in order to investigate the RPs that follow option C. However, this will be left for further study to investigate it in detail. Thus, it is assumed that this option can be linked with the possibility that discourse factors may have an impact on the use of RPs in Behdini. Option C can be interpreted in terms of pragmatics and context effects.

This test questions whether syntactic effects interact with discourse coherence by providing an option for the informants to think of context or the involvement of a third person as a possibility for decoding the identity of the pronouns used.

This drives us towards the field of pragmatics, which unlike semantics, studies how the transmission of meaning depends not only on structural and linguistic knowledge of the language user, but also on the context of the utterance, any pre-existing knowledge about those involved, the inferred intent of the speaker, and other factors. This relates to the hypothesis that the acquisition of some aspects of syntax is affected by the acquirer's understanding of information flow in discourse (Hughes & Allen, 2013).

Discourse factors are expected to have effects on the interpretation of the RPs used in syntactic islands in Behdini. A context might be needed in order to decode the pronouns used. In island conditions in Behdini, as in (100) below, RPs may be preferred when their antecedent is D-linked (discourse-linked).

(100) Mariya-yê çi got wan ew diz-î?
Mary-DIR what say.PAST.3SG they it steal.PAST-3SG
‘What did Mary claim did they steal it?’

So it might be speculated that resumptives in the marked option could be used in D-linked phrases. This suggests that the antecedents of RPs in D-linked phrases are immediately instantiated in a discourse representation which is checked during the process of the pronoun interpretation. So in order to improve the acceptability of RPs in such a sentence, participants might be more willing to accept it in a D-linked context suggesting that they check a discourse representation for the pronoun antecedent. To test this accurately, a context is necessary which is not included in this design. However, an option is given for participants to select it as marked and leave it for further studies.

Another type of possible markedness effect is provided in (101), which is not due to a discourse effect but to a lexical disambiguation. This is related to certain types of verbs that are ambiguous in meaning and can be interpreted differently and the context again should be used to specify the intended meaning.

(101) Eve ew zelam-e ew-ê ku wî Ceyn-ê mar kir-î.
Det that man-COP EZ-M COMP he Jane-OBL marriage do.PAST-3SG
'This is the man that he married Jane.'

In (101), the verb 'married' is ambiguous. It could either mean that John is the priest who did the marriage service for Jane or he could be the one who became her husband.

Regarding markedness and rating scores in the analysis, the discrete scores will be converted into a gradient measure corresponding to the probability of a degraded level of acceptability.

4.5.6 Procedure and participants

The JET has been conducted as an online survey by using a tool called SurveyMonkey. The participants were able to have access to the link of the survey via Facebook and email.

The participants were not required to make any corrections. No time limit for completion of the test was imposed. Nor was there any instruction requiring an immediate response. Thus, subjects were free to spend whatever time they wanted, and were able to change their mind in judging individual sentences.

The participants consisted of 30 native speakers of Behdini from Iraqi Kurdistan and 24 native speakers of English who were from the UK and the USA. Regarding Behdini subjects, ten were males and twenty were females; they ranged in age from 18 to 27, and all 30 persons use Behdini daily. All of the 30

Behdini informants were students of the English Department in University of Duhok, English being their second language. As for the English-speaking informants, 10 were males and 14 were females; their ages ranged from 18 to 35, and all of them use English daily.

4.5.7 Analysis, Results, and Discussion

The data are analysed using mixed-effects modeling by employing the glmer package (version is 3.1.0) with logit link function and binomial variance for the judgement data in R, an open-source language and environment for statistical computing. The reason why the regression design with mixed-effect modeling has been adopted for this study experiment is that regression designs are considered a more powerful and more flexible alternative to traditional ANOVAs (e.g. Baayen et al., 2006 and New et al., 2007). Moreover, regression designs allow for the statistical control of a large variety of variables in mixed-effects models including both fixed and random effects. Fixed effects in the models could be co-variates or factors. Co-variates are numerical variables, whereas factors are categorical variables with a fixed and low number of levels which exhaust the levels in the sampled population. The fixed effects are also repeatable. On the other hand, the variables included as random effects are not repeatable and do not usually have a fixed number of levels. Typical random effects in psycholinguistic studies are participant and item: both participants and items are in principle sampled randomly from the relevant populations, and each participant or item corresponds to a level of the variable which is not repeatable. It is to be noted that in this fixed-effect modeling mother sentences will be used as random effect because each of our test items is presented with four variants under one mother sentence, as explained above; so these four variants are not independent.

4.5.7.1 The English JET

A full description of the dataset used for English is provided in Table 4-6 below, in addition to the subsets it contains that are the product of fully crossed variables.

Table 4-6: Description of the English dataset

Dataset and R script:		English-data-1st-study; 1st-study.R
Size of dataset:		7160 obs. of 9 variables
Predictors	Factors	Conditions
Random effects	Participant	Anonymized English native speaking subjects: E1 to E24.
	Mother.sentence	The 4 variants of each sentence are assigned the same mother sentence (gap vs. RP and past vs. non-past). This mother sentence is treated as a random effect so that a separate intercept is fitted for each group of 4 sentence variants.
Fixed effects	Chain.foot	gap vs. resumptive
	Island	No vs. Yes
	Grammatical.role	subject, object, oblique, possessive
	Tense	Non-past vs. past
	Movement.type	long.wh.question, relative
	Origin.clause	relative, adjunct, sentential.subject, wh.clause
Dependent variable	Rating	A, B, C, D (corresponding to OK, Processed, Marked, Bad respectively)

4.5.7.1.1 A General Overview of the English Results

In this section a general overview of the results in English ratings is presented to make it easier to follow the statistical analysis of the results. This will include determining the contents of each subset of data in terms of the mother sentences included and an overview of the ratings based on English participants' judgements. The subsets comprise non-islands, relative clauses, and islands.

4.5.7.1.1.1 English non-islands

The mother sentences in the non-islands subset of English data include four possessives as in 82, four subject chains as in 83, four object chains as in 84, and four oblique arguments as in 85. Each mother sentence is, as mentioned earlier, presented with the four variants of +/- [RP], +/- [past]).

Table 4-7: Acceptance rates of English non-islands

	Subject				Object			
Rating	with gap		with RP		with gap		with RP	
A (good)	93%	178	5%	9	83%	315	4%	14
B	3%	5	3%	5	8%	32	12%	45
C	1%	2	4%	8	4%	16	15%	59
D (bad)	3%	7	88%	170	5%	21	69%	266

	Oblique				Possessive			
Rating	with gap		with RP		with gap		with RP	
A (good)	93%	176	5%	9	72%	138	6%	11
B	2%	5	12%	24	6%	11	11%	22
C	3%	6	18%	34	15%	29	12%	24
D (bad)	2%	5	65%	125	7%	14	71%	135

As shown in Table 4-7, in English non-islands there is a clear preference for gaps over RPs in the four positions in non-island relative clauses. This preference is almost categorical; 96% of participants accepted gaps in subject positions whereas only 14% accepted RPs. In object positions 91% of participants accepted gaps and 16% accepted RPs. In oblique arguments 95% of English native speakers accepted gaps and 17% accepted RPs. In possessives 78% of participants accepted gaps and 17% accepted RPs. Tense variation has no effect at all and same patterns are obtained both in past and non-past clauses.

4.5.7.1.1.2 English relative clauses

The subset of relative clauses in English involves only object chains including island and non-island clauses. Object non-island mother sentences are shown in 84, whereas mother sentences that are islands are shown in 86, 87, 88, and 89. The reason why subject, oblique, and possessive arguments are excluded is that they do not appear in island conditions.

Table 4-8: Acceptance rates of English relative clauses

	Non-islands				Islands			
Rating	with gap		with RP		with gap		with RP	
A (good)	83%	315	3%	14	12%	17	29%	42
B	8%	32	12%	45	28%	40	40%	57
C	4%	16	15%	59	7%	11	14%	21
D (bad)	5%	21	70%	266	53%	76	17%	24

Table 4-8 shows that in English relative clauses gaps are categorically preferred over RPs in non-island configurations. Gaps acceptance is rated as 91% whereas for RPs the rate of acceptance is 15%, and 70% of participants rejected RPs in non-islands. In island relative clauses, on the other hand, 60% of participants accepted RPs and only 17% rejected them, whereas 40% of participants accepted gaps and 53% rejected them. This shows that islands effectively interact with RPs as they increase the rate of acceptance of RPs.

4.5.7.1.1.3 English islands

Mother sentences of English islands are all object chains distributed into adjunct islands (as in 86), relative islands (as in 87), sentential subject islands (as in 88), and wh-clause islands (as in 89). Movement type in this subset divides the mother sentences into relative clauses (as in 86, 87, and 88) and long wh-questions (as in 86a, 88a, and 89).

Table 4-9: Acceptance rates of English islands

Islands	Adjunct				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	18%	35	17%	34	12%	17	29%	42
B	16%	30	61%	115	28%	40	40%	57
C	19%	36	16%	32	7%	11	15%	21
D (bad)	47%	91	6%	11	53%	76	16%	24

Islands	Sentential subject				Wh-clause			
Rating	with gap		with RP		with gap		with RP	
A (good)	16%	23	34%	49	8%	11	18%	26
B	15%	22	47%	68	9%	13	55%	79
C	9%	13	1%	1	13%	20	11%	16
D (bad)	60%	86	18%	26	70%	100	16%	23

Table 4-9 previews that RPs are preferred by the native speakers of English over the four island types. This preference is especially clear in sentential subject islands as 81% of participants accepted RPs and 31% accepted gaps. This is followed by wh-islands as 73% of participants accepted RPs and 17% accepted gaps. In relative clauses, 69% of participants accepted RPs and 57% accepted gaps. Finally, in adjunct islands 56% of participants accepted RPs and 34% accepted gaps. It is to be noted that the majority of participants rated the acceptance of RPs in islands as B denoting that even though those sentences were grammatical, they were complicated and demanded a certain extent of processing. As expected, tense variation was also not relevant and did not show any effects.

Table 4-10: Acceptance rates of movement type in English islands

Movement type	long.wh.question				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	9%	22	20%	49	17%	64	27%	102

B	13%	32	53%	127	19%	73	50%	192
C	12%	30	12%	30	13%	50	10%	40
D (bad)	66%	156	15%	34	51%	197	13%	50

Table 4-10 shows that the rates of acceptance of gaps and RPs are very similar in relative clauses and in long wh-questions in English islands. In both movement types RPs are preferred over gaps almost categorically. In long wh-questions 22% of participants accepted gaps and 73% accepted RPs, whereas in relative clauses 36% accepted gaps and 77% accepted RPs.

4.5.7.1.2 A Statistical Analysis of the English Data

The analysis is conducted by generalised linear mixed model using mixed-effects modeling by using the glmer in the logit link function, which transforms the binomial dependent variable into a continuous one (response variable is transformed in (log) probabilities of a reduction in acceptability), with full acceptability as reference level.

The above preliminary analysis in English and its counterpart in Behdini (as will be discussed later) show that only possessive structures behave categorically differently to the other structures in both languages. Therefore, the possessive structures have been analysed separately for both languages. Another reason behind excluding possessive structures from the rest of the subsets of data is because possessive clauses never appear in islands or wh-clauses. This leaves us with four subsets of data, one including only possessives which are then excluded from the rest of datasets, including non-islands, relative clauses, and islands, as follows:

(i) possessive structures

(ii) non-islands (including relative clauses and wh-questions)

(iii) relative clauses (comparing islands with non-islands)

(iv) all islands (comparing the four types of islands)

Thus, separate analyses are carried out for each subset of the data and a model is fitted to each of them, in order to investigate the research questions more comprehensibly.

The procedure for model fitting in the statistical analysis is as follows:

The dependent variable in this experiment is based on a 4-point grading scale starting with "A" as full acceptability, "B" as acceptability that bears processing, "C" as marked, and "D" as ungrammatical. The dependent variable will be with "A" or Full Acceptability as the reference level; the models will be set to the likelihood of reduced acceptability: a higher coefficient would indicate a higher likelihood of rejection. The dependent variable is converted into a gradient probability of a degraded judgement, using a logit link function in R.

The models in this analysis are fitted starting from random effects only, and then fixed effects are added incrementally. The analysis of the two random effects, participants and mother sentences, will account for any individual variation in the results that are due to the variation of participants or mother sentences. Afterwards, fixed effects are added one by one and retained only if they improve the model's fit.

There is a major advantage of being able to include both fixed and random effects. It makes it possible to assess whether group differences are significant over and above differences between individual participants. Another advantage is that a single analysis including random effects of participant and item can replace the usual separate ANOVAs by participant and by item.

4.5.7.1.2.1 English subset of data including only possessive structures

This subset of English data includes only possessive structures. It is created in order to check and confirm that possessive structures show a categorical variance in English. So a model is fitted to those structures only. And regarding the data distribution in this subset, the only factors with more than one level in this subset of data are chain foot and tense.

Four mother sentences are included in the possessives subset of data, which are shown in Appendix 2. Each mother sentence has four variants (i.e., with RP, with gap, in past, and in non-past).

It is to be noted that the possessives test items included a resumptive in the gap position instead of a possessive determiner because these are the forms used by non-native speakers.

There is no random variation by participants and by items (mother sentences), as a mixed-effect model was fitted showing that. So a box standard regression model, i.e., a linear regression model, is fitted for possessives instead. In this linear regression model, the random effects are removed. This is an approach for modeling the relationship between a scalar dependent variable and one or more explanatory variables (or independent variable). Because we have one explanatory variable, our case is called simple linear regression.

The best simple linear regression model for the English subset of possessive structures is included in the following formula:

lm(formula = rating ~ chain.foot, data = Eposs)

Chain foot is the only significant factor. The reference level for rating is A corresponding to full grammaticality. So positive coefficients listed in the model summary (Table 4-11) would indicate an increase in rejection, and for chain foot it is gap.

Table 4-11 previews the appropriate coefficients for the linear regression predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for chain.foot is gap.

The table shows that the estimate value of chain.footresumptive is 4.3429 and the effect size is (Z value = 10.283, $p < 0.001$). This means that when there is a resumptive pronoun, acceptance is lower than it is with gaps (as indicated by the high and positive coefficient value) in the possessive structures in English. The size of the effect suggests that gaps and RPs are categorically differentiated in English possessive structures.

Table 4-11: Coefficients for a simple linear regression model for the English subset of possessives (Reference levels: chain.foot: gap)

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-1.1381	0.2850	-3.993	6.53e-05 ***
chain.footresumptive	4.3429	0.4223	10.283	< 2e-16 ***

Figure 4-1 is a visualization for the optimal model in the possessives subset of English data. The figure shows that, as expected, gaps are accepted and RPs are rejected categorically in the English possessive structures. Tense (instantiated by the argument structure variable) is, as expected, irrelevant; the same acceptance rates are obtained in both non-past and past tense clauses.

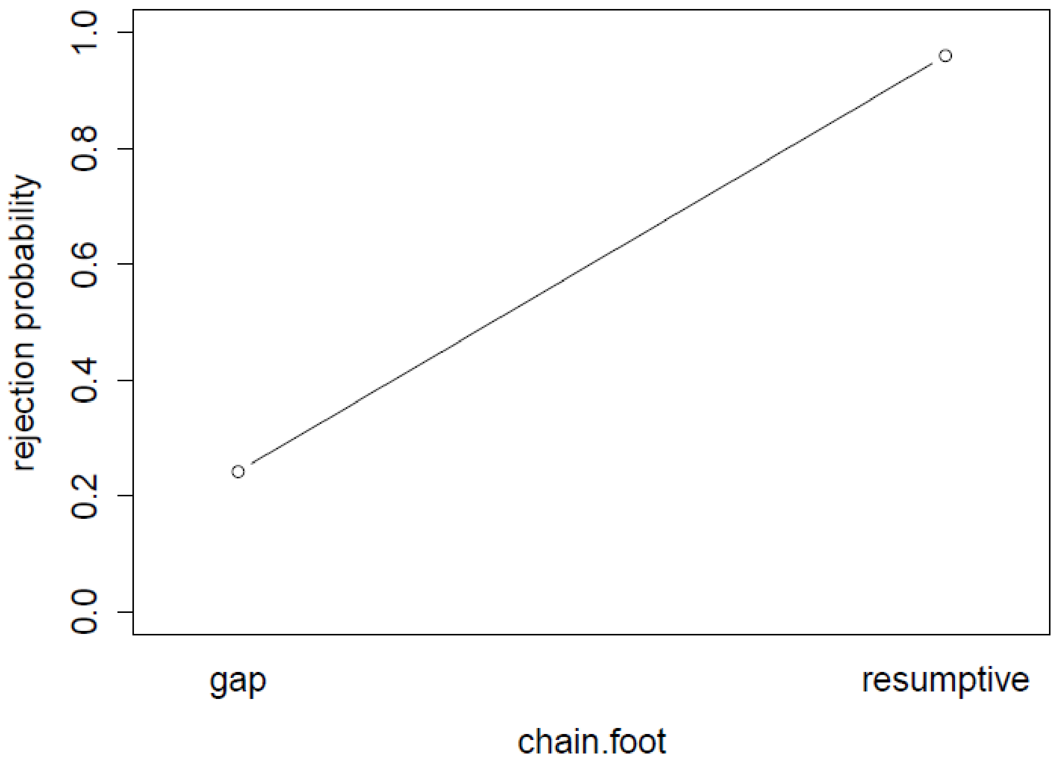

Figure 4-1: English possessives rejection probability

As predicted, the possessive structures show no variability: gaps are accepted and RPs are rejected almost categorically in English. Possessives take gaps obligatorily. They do not take RPs at all. Therefore, they will be removed from the other datasets analysed below.

4.3.4.1.2.2 English subset of data including non-island clauses

This analysis is carried out on the subset of English data including only non-island structures. The purpose of this analysis is to investigate the acceptability of resumptive pronouns and gaps in subject and object arguments in non-island clauses (after removing possessive and oblique structures). This subset of data includes only relative clauses that are embedded in presentative structures. The distribution of the non-island relative clauses subset of data is shown in Table 4-

4. As shown below, factors are added one by one starting from a model including only random effects.

The best mixed-effects logistic model for the subset of non-islands in English is included in the following formula:

rating ~ chain.foot + (1|mother.sentence)

The formula indicates that acceptability varies according to the main effect of chain foot. This element is the fixed effect of the modeling. The mother sentence element is taken into account as a random effect.

Table 4-12 lists the coefficients for the random effect predictors. As shown in the table, the standard deviation is 0.9413 for the mother sentence. As for the random effect of participant, it has no effect on the variation of non-islands in English. Comparing a model with mother sentence to a model with mother sentence and participant resulted in increasing Akaike's Information Criterion (AIC) from 1581.1 to 1583.1.

Table 4-12: Coefficients for the random effects of the English non-islands subset of data

Random effects:			
Groups	Name	Variance	Std.Dev.
mother.sentence	(Intercept)	0.8861	0.9413

Table 4-13 lists the statistics for the decrease in AIC as different terms are added to the model specification. The AIC is a measure of goodness of fit that punishes models for having many coefficients. The reduction in AIC accomplished by a predictor is an excellent guide to its importance and its significance (Baayen et al., 2013). The bigger the reduction in the AIC, the more important the factor is.

The column labeled *df.resid* lists the residual deviance, which is the variation in the data that is unexplained. As more predictors are added, the residual deviance decreases. The column named *Df* specifies how many coefficients were required to bring the residual deviance down. How much the deviance was reduced is given by the column labeled *Deviance*. The column with *Pr(>Chisq)* is the p-values that show that each reduction in AIC is significant, i.e. indicating that the addition of the factor in question improved the model fit significantly.

The table shows that chain foot is the only significant predictor in the model, as shown by the significant reduction in AIC with a significant p-value (p < 0.00000000000000022). Argument structure (tense) ended up being insignificant in the modeling neither as main effect nor in interaction because there is no reduction in AIC as shown in Table 4-13.

Table 4-13: Model comparison statistics for the English non-island clauses subset of data

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1149	620.21	1	614.21	< 2.2e-16 ***	960.86
chain.foot + grammatical.role	1148	620.68	2	612.68	0.2159	-0.47
chain.foot * grammatical.role	1147	621.79	2	611.79	0.298	-0.83

Table 4-14 lists the coefficients for the fixed-effect predictors. The intercept represents the group mean for rating=A (Grammatical) and chain.foot=gap because the intercept corresponds to the combination of the reference levels of each factor. The estimate tells us the probability of an increase in rejection.

It is clear in Table 4-10 that the estimate value of the chain.footresumptive is 5.6063, indicating that in English non-island structures resumptive pronouns lead to an increase in the rejection rate compared with structures with gaps (which are the reference level). To sum up, in English non-islands gaps are preferred over RPs almost categorically.

Table 4-14: Coefficients of a generalised linear mixed model fitted to the rejection rates of non-islands by English native speakers (Reference levels: chain.foot: gap)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-2.0826	0.3086	-6.748	1.49e-11 ***
chain.footresumptive	5.6063	0.2995	18.716	< 2e-16 ***

Figure 4-2 plots the coefficients in the best model for the English non-island structures, showing the effect of chain foot in English non-islands.

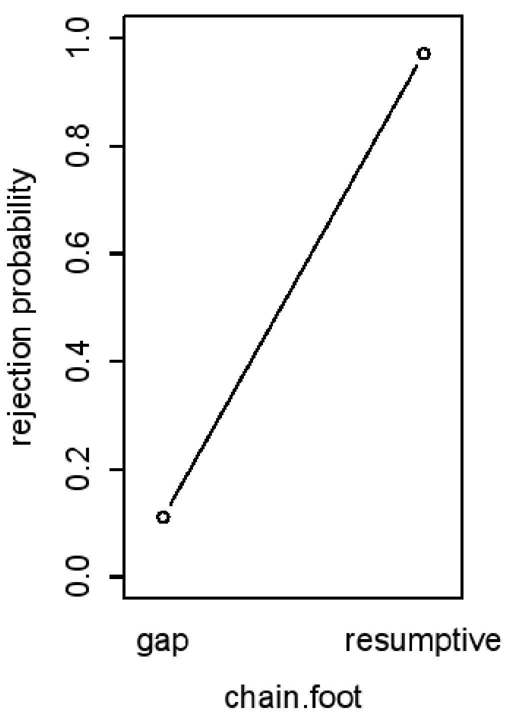

Figure 4- 2: English non-island structures rejection probability

Figure 4-2 shows that gaps are categorically preferred over RPs in the English non-islands. As shown in Table 4-14, native speakers of English rejected RPs significantly and categorically more than gaps in non-island configurations (Z value = 18.716, $p < 0.001$).

4.5.7.1.2.2 English subset of data including only relative clauses

This is an analysis that is carried out on the subset of English data including only relative clauses. The aim of the analysis of this dataset is to predict the acceptability of resumptive pronouns in island vs. non-island clauses.

The relative clauses in this subset of data are embedded in presentative or wh-structures in the island condition, and this is captured by the Movement Type variable. It also contains the grammatical role factor from which possessives, subject, and oblique arguments are excluded because they do not appear in islands. The dataset also involves tense, island, and of course chain foot. The distribution of the relative clauses subset of data is shown in Tables 4-4 and 4-5. So the data include only object clauses.

The expectation is that there will be an interaction of island and chain foot, i.e., RPs would be accepted in islands but not in non-islands. This is based on the literature showing the intrusive status of English resumptives (Sells, 1984; McCloskey, 2002). As shown below, factors will be added one by one starting from a model including only random effects.

The best mixed-effects logistic model for the subset of relative clauses in English is described by the following formula:

rating ~ chain.foot * island + (1|mother.sentence) +
(1+chain.foot|participant)

The formula indicates that in the fixed effects part of the modeling chain foot and island are taken into account in a two-way interaction. The mother sentence is taken into account as a random effect, and random intercepts and slopes for participant by chain foot are also taken into account in the random effects part of modeling. As expected, tense turned out to be insignificant.

Table 4-15 lists the coefficients for the two random effect predictors of mother sentence and participant. The table shows that the two random effects are allowed to vary. The standard deviation is 0.8957 for the mother sentence and 0.4925 for the participant. This indicates that the effect of mother sentence accounts for a higher range of the total variance in the relative clauses subset of English data. The random individual variation shows a significant AIC reduction if the random slope is included for chain foot, but not for island. The correlation for random slopes of participant and chain foot is 0.54. Figure 4-3 is a visualization of the random intercepts and slopes for participant by chain foot. The figure shows that only two English native speaking participants prefer RPs in non-island relative clauses and no one rejects gaps in island relative clauses.

Table 4-15: Coefficients for the random effects for the English relative clauses subset of data

Random effects:				
Groups	Name	Variance	Std.Dev.	Corr
participant	(Intercept)	0.2426	0.4925	
	chain.footresumptive	0.1836	0.4285	0.54
mother.sentence	(Intercept)	0.8022	0.8957	

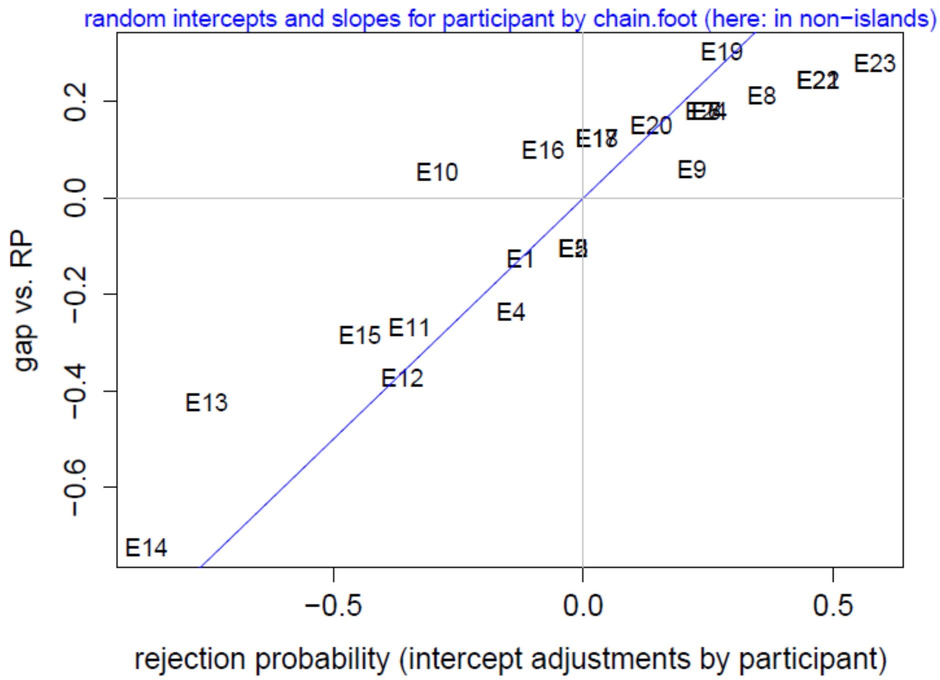

Figure 4- 3: Random intercepts and slopes for participant by chain.foot in English relative clauses (Reference levels: rating: fully acceptable, chain.foot: gap)

Table 4-16 lists the statistics for the decrease in AIC as different terms are added to the model specification in English relative clauses. The table shows that the interaction of chain foot and island is the most significant predictor in the model, as shown by the significant reduction in AIC with a significant p-value ($p < 0.00000000000000022$), and the reduction in AIC is 255.32. This is followed by chain foot as a main effect with 61.1 as reduction in AIC. This is followed by the main effects of chain foot and island with 4.51 as reduction in AIC. Argument structure (tense) ended up being insignificant in the modeling both as a main effect with -0.01 as increase in AIC, and in interaction with chain foot with -0.56 as increase in AIC.

Table 4-16: Model comparison statistics for the English relative clauses subset of data

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1050	974.33	1	962.33	1.969e-15 ***	61.1
chain.foot * argument.structure	1048	974.89	2	982.23	0.1284	-0.56
chain.foot + island	1049	969.82	2	955.82	0.01074 *	4.51
chain.foot * island	1048	714.50	2	698.50	< 2.2e-16 ***	255.32
chain.foot * island + argument.structure	1047	714.51	3	696.51	0.1584	-0.01

Table 4-17 lists the coefficients for the fixed-effect predictors. The intercept represents the group mean for rating=A (denoting acceptance), chain.foot=gap, and island=no because the intercept corresponds to the combination of the reference levels of each factor. The estimate tells us the probability of an increase in rejection.

Table 4-17: Coefficients of a generalised linear mixed model fitted to the rejection rates of relative clauses by English native speakers (Reference levels: chain.foot: gap, island: no)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-1.8574	0.3744	-4.962	6.99e-07 ***
chain.footresumptive	5.7819	0.4087	14.146	< 2e-16 ***
islandyes	4.1011	0.6972	5.882	4.05e-09 ***
chain.footresumptive:islandyes	-6.9547	0.5249	-13.249	< 2e-16 ***

Figure 4-4 illustrates the coefficients in the best model for the English relative clauses subset. It shows the interaction of island and chain foot in English relative clauses.

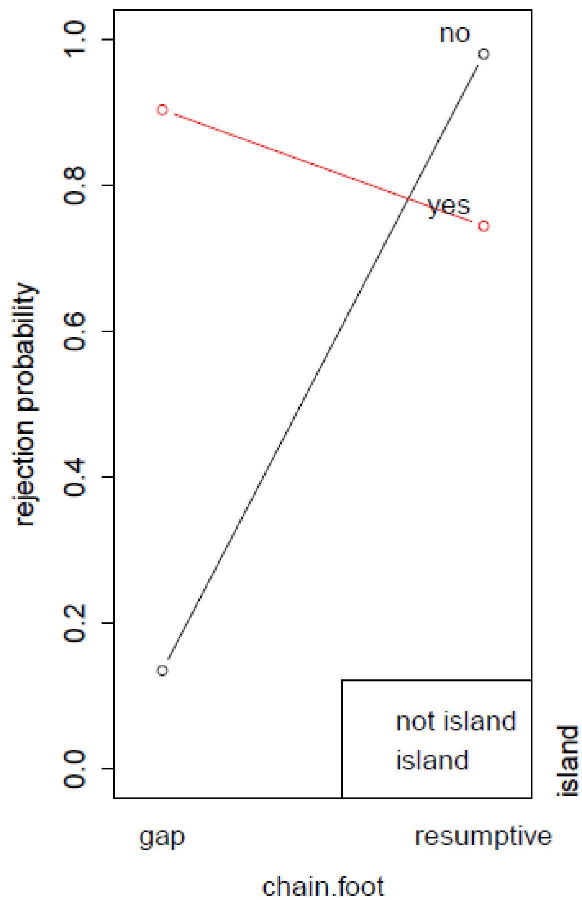

Figure 4-4: English object relative clause rejection probability

As shown in Figure 4-4 and Table 4-17, English native speakers generally prefer the resumptive pronouns in island clauses over the existence of gaps in the subset of relative clauses and both are only marginally accepted. This means that RPs have improved the acceptability of islands, compared to islands containing gaps which are highly degraded.

And it looks like even with the presence of a resumptive element, relative clauses in an island configuration are degraded if compared with those with gaps not in an island configuration. In non-island relative clauses gaps are highly accepted, whereas RPs are rejected categorically. So in non-islands the acceptability is more clear-cut than in islands. This is in line with the theoretical expectation that

RPs are not tolerated in English relative clauses unless they are in island configurations (Sells, 1984; McCloskey, 2002).

Statistically speaking, Table 4-17 shows that the estimate of chain.footresumptive values at 5.7819 and the effect size is (Z value = 14.146, p < 0.001), indicating a high rate of rejection when there is a resumptive pronoun in English non-island relative clauses. Compared with gaps, the estimate value of islandyes is 4.1011 and the effect size is (Z value = 5.882, p < 0.001), again indicating a high rate of rejection when there is a gap and when the clause is an island in English relative clauses. However, the chain.footresumptive:islandyes shows the only significant interaction in the model and its estimate value is high and positive, which is -6.9547, and the effect size is (Z value = -13.249, p < 0.001). This shows that the rate of acceptability increases highly and significantly when island interacts with chain foot, that is when the relative clause is an island and there is a resumptive pronoun. This means that the relative acceptability of RPs vs. gaps is reversed in island vs. non-island relative clauses.

To sum up the results from English relative clauses, there is a quasi-categorical rejection of RPs in relative clauses when not in islands (indicated by the black line in Figure 4-4). There is also a quasi-categorical rejection of islands with gaps (indicated by the red line in Figure 4-4). RPs partially rescue island configurations (with no significant differences between island types as will be seen in the next subset analysis). Finally, there is a random individual variation as the random slopes of participants interact with chain foot (Figure 4-3).

As mentioned earlier, no experimental studies have revealed the effect of the interaction between RPs and island effects in intrusive pronouns in English (Ferrera et al., 2005; Alexopoulou & Keller, 2007; Heestand et al., 2011; Keffala & Goodall, 2011; Han et al., 2012; and Polesky et al., 2013). The results of the relative clauses analysis above clearly show that RPs rescue island violations in English. Therefore, this experiment might be the first one to demonstrate the reality of the effect of the interaction of resumption and islan effects in English.

4.5.7.1.2.3 English subset of data including only islands

This subset of data looks at all the island clauses including long wh-questions, relative clauses, adjuncts, and sentential subjects. The aim is to compare the four types of island to see if RPs behave the same in all the four types of island. This subset includes the relative clause islands analysed above.

Regarding the distribution of the data, all the data are islands in which possessive, subject, and oblique arguments are excluded. Subject and oblique arguments are removed because they appear only in non-islands. This subset includes movement type and origin clause. The distribution of the sentences in the island data is laid out in Table 4-5.

The best mixed-effects logistic model for the subset of islands in English data is described in the following formula:

rating ~ chain.foot + (1|mother.sentence) + (1|participant)

The formula includes the chain foot (gap vs. resumptive) as a main effect in the fixed-effect factors part, and this is to compare the presence of RPs in the four types of islands to see if resumptives behave the same way in all types of islands. As for the last two elements, (1|mother.sentence) and (1|participant), they are treated as random effects. The reference level for chain foot is gap and for rating is A denoting full grammaticality.

Table 4-18 lists the coefficients for the random effects part of the formula in the English islands subset of data in order to see if there is any individual variation based on the two random effects of participant and item number realized as mother sentence. Mother sentence accounts for a higher range of variance in this subset of data because its standard deviation is 0.9106, whereas it is 0.3426 for participant. It is to be noted that participant did not converge with random slopes.

Table 4-18: Coefficients for the random effects for the English islands subset of data

Random effects:			
Groups	Name	Variance	Std.Dev.
participant	(Intercept)	0.1174	0.3426
mother.sentence	(Intercept)	0.8291	0.9106

Table 4-19 shows that origin clause is not significant and does not lead to decreasing the AIC, and that is why it is not included in the fit of the model. The table shows that chain foot is the most important element in the modeling of English islands subset of data because it has scored the highest reduction in AIC with 22.2 with a significant and low p-value (8.943e-07 ***). Origin clause, tense (argument structure), and movement type ended up being insignificant. Origin clause increased the AIC with -3.6, argument structure increased the AIC with -1, and the increase in AIC is -1.4 for movement type.

Table 4-19: Model comparison statistics for the English islands subset of data

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1244	1136.9	1	1128.9	8.943e-07 ***	22.2
chain.foot + origin.clause	1241	1140.5	2	1126.5	0.4864	-3.6
chain.foot + argument.structure	1243	1137.9	2	1228.9	0.1864	-1
chain.foot + movement.type	1243	1138.3	2	1128.3	0.4242	-1.4

Table 4-20 lists the coefficients for the fixed-effects part of the formula in the English islands subset of data. As shown in the table when chain foot is resumptive, the estimate value of the intercept highly and significantly increases as the intercept for the chain.footresumptive is estimated at -0.7512 with a high effect size (Z value = -4.875, $p < 0.001$). This shows that when there is a resmptive pronoun in island conditions in English, the acceptability rate tends to increase significantly.

As for the effect of origin clause, the results are generally not significant if we take the four types of islands into consideration.

Table 4-20: Coefficients of a generalised linear mixed model fitted to the rejection rates of islands by English native speakers (Reference levels: chain.foot: gap)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	2.1117	0.2952	7.154	8.41e-13 ***
chain.footresumptive	-0.7512	0.1541	-4.875	1.09e-06 ***

To sum up, the results from the English data confirm that English features intrusive pronouns. English only allows the use of resumptives in island configurations marginally to rescue the otherwise ungrammatical constructions. Therefore, there is a clear interaction between islands and chain foot and there is no significant difference between types of islands in terms of their sensitivity to the presence of RPs. The other conclusion that can be derived is that tense variation, as expected, does not have any effects on the presence of gaps and resumptives in English. This means that whether the clause is in past or in non-past structures, gaps are preferred over resumtpives except for the island configurations in which resumptives are accepted more than gaps.

4.5.7.2 The Behdini JET

Table 4-21 provides a full description of the dataset used for the Behdini analysis in addition to the subsets of the data that are the product of fully crossed variables.

Table 4-21: Description of the Behdini dataset

Dataset and R script:		Behdini-data-1st-study; 1st-study.R
Size of dataset:		4320 obs. of 11 variables
Predictors	Factors	Conditions
Random effects	Participant	Anonymized Behdini native speaking subjects: B1 to B30.
	Mother.sentence	The 4 variants of each sentence are assigned the same mother sentence (gap vs. RP and past vs. non-past). This mother sentence is treated as a random effect so that a separate intercept is fitted for each group of 4 sentence variants.
Fixed effects	Chain.foot	gap vs. resumptive
	Island	no vs. yes
	Grammatical.role	subject, object, oblique, possessive
	Argument.structure	accusative vs. ergative
	Movement.type	wh.question, relative
	Origin.clause	relative, adjunct, sentential.subject, wh.clause
Dummy-coded Factors	Verbal.Agreement	subject.accusative, object.ergative
Dependent variable	Rating	A, B, C, D (corresponding to OK, Processed, Marked, Bad respectively)

4.5.7.2.1 A General Overview of the Behdini Results

In this section, as in English results, a general overview of the results in Behdini ratings is presented. The content of the Behdini data is identical to the English data, and so the same mother sentences are included. The subsets include non-islands, relative clauses, and islands. The data distribution is just like the one followed in English analysis.

4.5.7.2.1.1 Behdini non-islands

Table 4-22: Acceptance rates of Behdini non-islands (Accusative structures)

Accusative	Subject				Object			
Rating	with gap		with RP		with gap		with RP	
A (good)	70%	84	34%	41	43%	105	27%	66
B	27%	32	34%	41	20%	46	36%	86
C	3%	4	16%	19	19%	45	16%	39
D (bad)	0%	0	16%	19	18%	44	21%	49

Accusative	Oblique				Possessive			
Rating	with gap		with RP		with gap		with RP	
A (good)	59%	70	60%	72	2%	3	78%	93
B	17%	20	31%	37	7%	8	17%	20
C	7%	9	4%	5	6%	7	2%	3
D (bad)	17%	21	5%	6	85%	102	3%	4

Table 4-23: Acceptance rates of Behdini non-islands (Ergative structures)

Ergative	Subject				Object			
Rating	with gap		with RP		with gap		with RP	
A (good)	72%	87	20%	25	62%	149	12%	30
B	21%	26	20%	24	22%	52	32%	76
C	7%	7	28%	33	6%	15	20%	49
D (bad)	0%	0	32%	38	10%	24	36%	85

Ergative	Oblique				Possessive			
Rating	with gap		with RP		with gap		with RP	
A (good)	55%	66	48%	57	4%	5	74%	89
B	17%	20	22%	27	10%	12	17%	20
C	8%	10	15%	18	9%	11	7%	8
D (bad)	20%	24	15%	18	77%	92	2%	3

Tables 4-22 and 4-23 show that in Behdini non-islands it is clear that possessives behave entirely differently than the rest of grammatical roles as they show a categorical preference of RPs over gaps both in accusative and ergative structures. 95% of Behdini participants accepted RPs in possessives in accusative structures and 91% in ergative structures, whereas only 9% in accusative and 14% in ergative structures accepted gaps.

For the rest of grammatical roles, RPs and gaps are accepted almost similarly in object and oblique arguments showing that the use of RPs is optional. RPs in oblique arguments are rated higher than in object positions in both argument structures. In subject clauses, gaps are preferred over RPs. This preference is more robust in ergative structures. However, RPs in subject clauses are rated equally as RPs in object clauses.

4.5.7.2.1.2 Behdini relative clauses

Table 4-24: Acceptance rates of Behdini relative clauses

Accusative	Non-islands				Islands			
Rating	with gap		with RP		with gap		with RP	
A (good)	45%	105	28%	66	23%	21	58%	52
B	20%	46	36%	86	28%	25	16%	14
C	18%	45	16%	39	19%	17	22%	20
D (bad)	17%	44	20%	49	30%	27	4%	4

Ergative	Non-islands				Islands			
Rating	with gap		with RP		with gap		with RP	
A (good)	62%	149	13%	30	31%	28	37%	33
B	22%	52	32%	76	22%	20	16%	14
C	6%	15	20%	49	21%	19	30%	27
D (bad)	10%	24	35%	85	26%	23	17%	16

As shown in Table 4-24, in accusative structures RPs with 64% and gaps with 65% are equally accepted in non-islands showing a clear optionality. However, in ergative structures gaps are highly preferred over RPs as 84% of participants accepted gaps and 45% accepted RPs. As for island clauses, in both argument structures RPs and gaps are equally accepted with a slight preference for RPs in accusative structures as 74% of participants accepted RPs and 51% accepted gaps. So RPs have increased the acceptance rates in all cases whether in islands or in non-islands. This suggests that Behdini shows a certain extent of optionality with regard to the use of RPs and gaps and it also suggests that Behdini is less sensitive to the interaction of resumptives and islands.

4.5.7.2.1.3 Behdini islands

Table 4-25: Acceptance rates of Behdini islands (Accusative structures)

Accusative	Adjunct				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	42%	50	44%	53	23%	21	58%	52
B	26%	31	24%	29	28%	25	16%	14
C	20%	24	20%	24	19%	17	22%	20
D (bad)	12%	15	12%	14	30%	27	4%	4

Accusative	Sentential subject				Wh-clause			
Rating	with gap		with RP		with gap		with RP	
A (good)	23%	21	48%	43	10%	9	13%	12

B	38%	34	35%	31	13%	12	16%	14
C	29%	26	13%	12	33%	30	13%	12
D (bad)	10%	9	4%	4	43%	39	58%	52

Table 4-26: Acceptance rates of Behdini islands (Ergative structures)

Ergative	Adjunct				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	34%	41	28%	34	31%	28	37%	33
B	30%	36	28%	35	22%	20	16%	14
C	20%	24	26%	32	21%	19	30%	27
D (bad)	16%	19	18%	19	26%	23	17%	16

Ergative	Sentential subject				Wh-clause			
Rating	with gap		with RP		with gap		with RP	
A (good)	26%	23	33%	30	10%	9	8%	7
B	40%	36	35%	31	13%	12	10%	9
C	16%	14	18%	16	26%	23	13%	12
D (bad)	18%	17	14%	13	52%	46	69%	62

The results of Behdni islands, summarised in Tables 4-25 and 4-26, show that RPs are generally preferred over gaps in all the four origin clauses. RPs are accepted more than gaps in sentential subject and relative island clauses, but gaps are preferred to RPs in adjuncts and wh-clauses. The effect of argument structure is realized in that accusative structures are rated higher than ergative structures both in RPs and gaps, and RPs are slightly preferred over gaps in Behdini island clauses in both case structures.

Table 4-27: Acceptance rates of movement type in Behdini islands

Movement type Accusative	long.wh.question				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	19%	28	26%	39	30%	73	50%	121
B	29%	30	19%	28	30%	72	25%	60

C	31%	46	18%	27	21%	51	17%	41
D (bad)	31%	46	37%	56	18%	44	8%	18
Movement type Ergative	long.wh.question				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	20%	30	17%	26	30%	71	32%	78
B	25%	37	17%	26	28%	67	26%	63
C	20%	30	16%	24	20%	50	26%	63
D (bad)	35%	53	50%	74	22%	52	16%	36

Table 4-27 shows that Behdini participants accepted more RPs in relative clauses than in long wh-questions, and argument structure has no effects as same patterns are obtained in both accusative and ergative structures.

4.5.7.2.2 A Statistical Analysis of the Behdini Results

4.5.7.2.2.1 Behdini subset including only possessive structures

This subset of Behdini data includes only possessive clauses. It is created in order to check and confirm that there is no variability in the possessive structures apart from RPs being accepted and gaps being rejected categorically, which behaves exactly in the opposite way to English in possessive structures. Thus a model is fitted to those structures only.

The only factors with more than one level in this subset of data are chain foot and argument structure.

As in English data, a mixed-effect modeling for the Behdini subset of possessive structures shows that there is no random variation by participant and mother sentence. That is why a simple linear regression model is fitted for Behdini possessive structures in which random effects are excluded.

The minimal adequate simple linear regression model for the Behdini subset of data including only possessive structures is represented by the following formula:

lm(formula = rating ~ chain.foot, data = poss)

Chain foot is the only significant factor. The reference or default level for rating is A denoting full grammaticality and for chain foot it is gap.

Table 4-28 lists the appropriate parameters or coefficients for the simple linear regression predictors in Behdini possessives subset of data. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for chain foot is gap. The estimate value of chain.footresumptive is -2.6830 and the effect size is (Z value = -12.92, $p < 0.001$), and this indicates that when there is a resumptive pronoun in Behdini possessive structures, the rate of acceptability highly increases.

Table 4-28: Coefficients for a simple linear regression model fitted for the Behdini subset of possessives (Reference levels: chain.foot: gap)

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	1.9363	0.1896	10.21	<2e-16 ***
chain.footresumptive	-2.6830	0.2077	-12.92	<2e-16 ***

Figure 4-5 is a graph that shows the visualization for the coefficients of the optimal model for the subset of Behdini possessives.

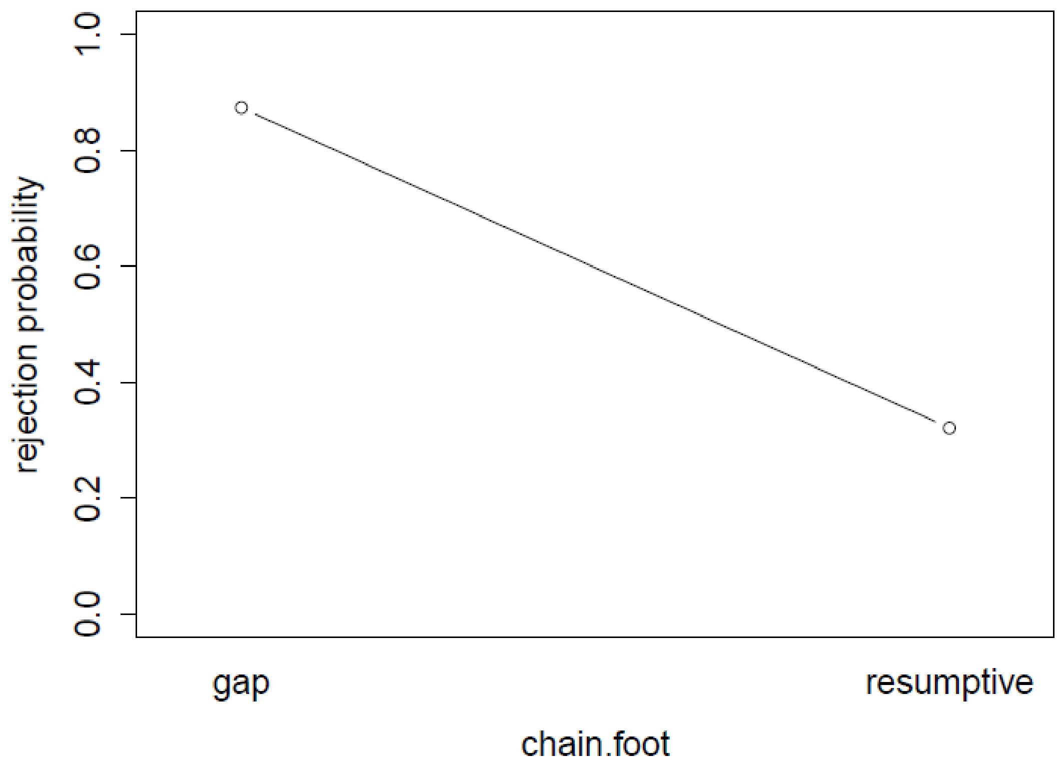

Figure 4-5: Behdini possessives rejection probability

With respect to AIC reduction, argument structure is not significant, as expected, because whether the possessive clause is in accusative or ergative structure resumptives are preferred over gaps highly and significantly.

As predicted, the possessive clauses show no variability: they take resumptives obligatorily. They do not take gaps at all. This being the case, I have excluded the possessive clauses from the other datasets in which, as will be shown below, variability is observed.

The acceptability in possessives in Behdini is categorical and very different from what the other datasets below show. What follows is the analysis of subsets from the Behdini data without possessive clauses in the three subsets of non-islands, relative clauses, and islands.

4.5.7.2.2.2 Behdini subset of data including non-island clauses

This subset of data looks at non-island structures in Behdini to compare the acceptance of resumptives and gaps within the arguments that are captured by the grammatical role factor from which possessives and oblique arguments are removed. That is why the grammatical role corresponds only to subject and object clauses. The dataset also involves argument structure and of course chain foot. The distribution of the non-island clauses subset of data is shown in Table 4-4. This subset of data will help investigate the effects that verbal agreement might have on the resumption omission in accusative subject and ergative object clauses.

The factors that control the variation of the data in the non-island clauses subset of Behdini data are included in the following formula:

rating ~ chain.foot * argument.structure * grammatical.role + (1|mother.sentence)

The formula indicates that chain foot (whether there is gap or resumptive), argument structure (whether the structure is accusative or ergative), and grammatical role (whether the clause is subject or object) are taken into account in a three-way interaction. These are all fixed effects. The last element, i.e., (1|mother.sentence), is a random effect.

Table 4-29 shows the coefficients for the random effects part of the modeling in the non-island subset of Behdini data to show if there are any individual variations based on the random effects of participants and items functioned as mother sentences. The table shows that the mother sentence effect allows for data to vary slightly with the standard deviation measured as 0.3565. The participant effect, on the other hand, hardly showed a variance, as it leads to increase the AIC with -0.2, which means that there is no significant individual variation in the acceptance rates in non-islands in Behdini.

Table 4-29: Coefficients for the random effects for the Behdini subset of non-island clauses

Random effects:			
Groups	Name	Variance	Std.Dev.
mother.sentence	(Intercept)	0.1271	0.3565

Table 4-30 lists the reduction of AIC in an ANOVA comparison for the significant factors that were added to build the optimal model in the non-island subset of data. As shown in the table, all the coefficients are well-supported by low and significant p-values. The table previews that chain foot as a main effect forms the most important element in the modeling in terms of reduction in AIC, as it reaches 208.3. This is followed by the interaction of chain foot and argument structure with 32.1 as reduction in AIC. Finally, this is followed by the interaction of chain foot and argument structure plus the main effect of grammatical role with 3.3 as reduction in AIC. The three-way interaction of chain foot, argument structure, and grammatical role is the least significant with 0.5 as reduction in AIC. Verbal.Agreement scored a similar AIC with argument structure and grammatical role.

Table 4-30: Model comparison statistics for the Behdini subset of non-island clauses

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1437	1710.3	1	1704.3	< 2.2e-16 ***	208.3
chain.foot * argument.structure	1435	1678.2	2	1668.2	1.493e-08 ***	32.1
chain.foot * argument.structure + grammatical.role	1434	1674.9	3	1662.9	0.0204 *	3.3

chain.foot * argument.structure * grammatical.role	1431	1674.4	3	1656.4	0.09303 *	0.5

Table 4-31 previews the coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for chain foot is gap, for argument structure is accusative, and for grammatical role is object. As for rating, the reference level is calibrated for A, which corresponds to full grammaticality and thus a degraded acceptability is denoted.

Table 4-31: Coefficients of a generalised linear mixed model fitted to the rejection rates of non-islands by Behdini native speakers (Reference levels: chain.foot: gap, grammatical.role: object, argument.structure: accusative)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.2572	0.1825	1.410	0.158596
chain.footresumptive	0.7372	0.1971	3.740	0.000184 ***
argument.structureergative	-0.7650	0.1888	-4.052	5.08e-05 ***
grammatical.rolesubject.A	-1.1335	0.3260	-3.478	0.000506 ***
chain.footresumptive:argument.structureergative	1.7600	0.3095	5.687	1.30e-08 ***
chain.footresumptive:grammatical.rolesubject.A	0.8194	0.3445	2.379	0.017369 *
argument.structureergative:grammatical.rolesubjec	0.6390	0.3460	1.847	0.064743 *
chain.footresumptive:argument.structureergative:grammatical.rolesubject	-0.9360	0.5194	-1.802	0.071548 *

Table 4-31 shows that when the argument structure corresponds to the ergative in Behdini non-island clauses, the rate of acceptance is enhanced; this is indicated by the estimate value of argument.structureergative, which is -0.7650, and the effect size is (Z value = -4.052, p < 0.001). As for the interaction of chain foot and argument structure, the estimate value of chain.footresumptive:argument.structureergative is 1.7600, and the effect size is

(Z value = 5.687, $p < 0.001$), which means that Behdini speakers prefer gaps in object non-island dependencies.

Figure 4-6 visualizes the coefficients involved in the optimal model for the relative clauses subset of the Behdini data, showing the effect of chain foot, argument structure, and grammatical role.

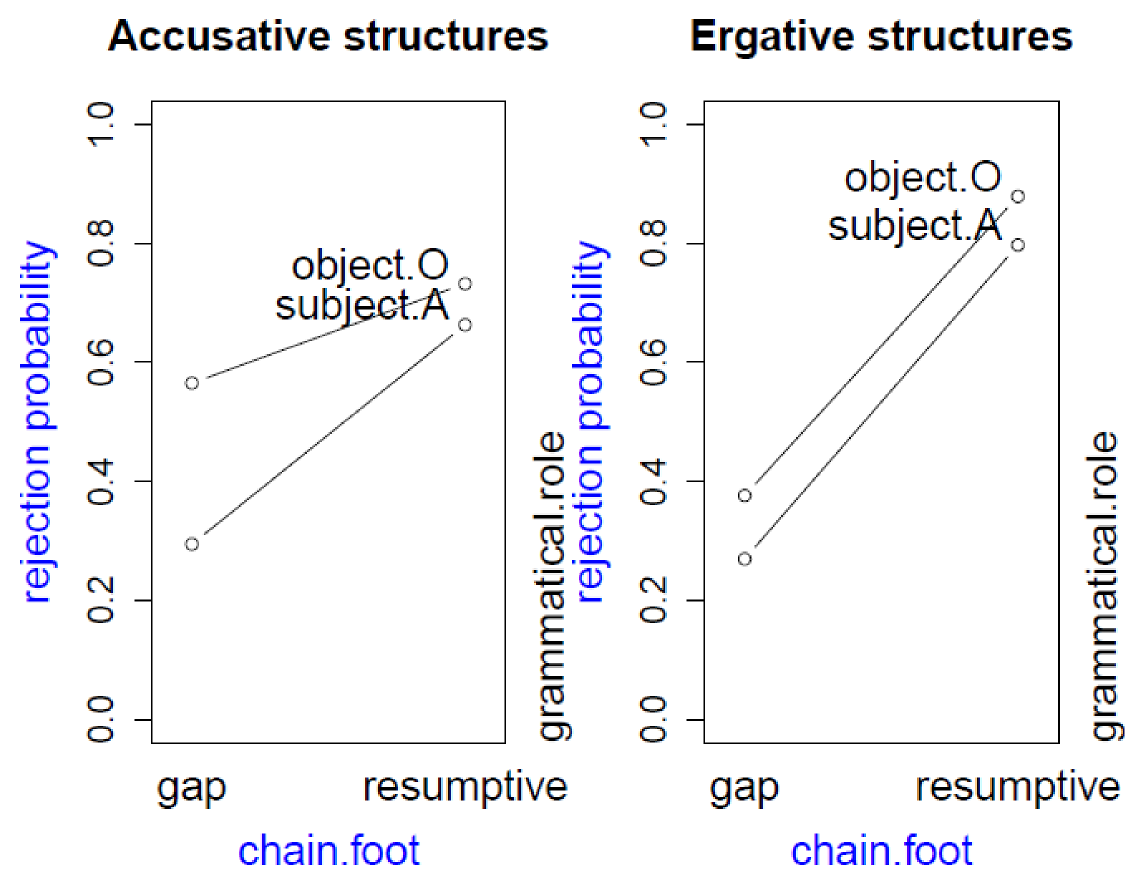

Figure 4-6: Behdini non-island structures rejection probability

Figure 4-6 is a visualization that reports the combined effect of chain foot, argument structure, and grammatical role in non-island relative clauses in Behdini. The figure shows that, in general, gaps are highly preferred over RPs. This is indicated in Table 4-31 in which the estimate value of chain.footresumptive is 0.7372, and this means that resumptive pronouns in

Behdini non-islands lead to increase the rejection rate. And the effect size is (Z value = 3.740, $p < 0.001$).

However, in object chains in accusative structures, the preference of gaps is much less marked (i.e. gaps are accepted much less than in the general pattern). There is also a general tendency for object chains to be rated lower than subject chains and the effect size is (Z value = -3.478, $p < 0.001$).

The figure also shows that RPs in subject accusative clauses are rated slightly higher than RPs in object accusative clauses despite the fact of the preference of gaps over RPs in subject dependencies. In ergative structures, on the other hand, RPs in object dependencies are rated parametrically higher than RPs in subject dependencies

What is interesting is that resumptives are accepted in ergative object relative clauses more than in accusative subject relative clauses. This is reflected in Table 4-31 as the estimate value of argument.structureergative:grammatical.rolesubjec is 0.6390, and the effect size is (Z value = 1.847, $p < 0.001$). This suggests that the hypothesis regarding the effect of split ergative agreement patterns is partly confirmed: at least in the case of objects, but not subjects. This is because it was expected that RPs in ergative object and accusative subject clauses would be rated equally due to the effect of ergative and accusative case marking on arguments based on their verbal agreement (accusative subjects agree with the verb, and ergative objects agree with the verb; both of these agreement paradigms are realized morphologically) (see 4.5.1).

The hypothesis was based on the assumption that morphological agreement licenses the null resumptives. Effectively, this would mean that in cases where the verb agrees with the argument corresponding to the foot of the chain, acceptability should be as if there had been a resumptive rather than a gap. This argument corresponds to subject in accusative case and to object in ergative case. That is why it was expected that accusative subjects would pattern like ergative objects and both would yield a high resumptive acceptance rate.

Therefore, the hypothesis is not confirmed in the case of subjects and it is speculated that this could be due to the interaction with another factor, and the investigation of what that factor might be is beyond the scope of this study and it will be left for future research.

Subject relative clauses get better ratings than object relative clauses, and this is shown in Table 4-31 as the estimate of grammatical.rolesubject.A values at -1.1335 and the effect size is (Z value = 0.3260, $p < 0.001$), indicating that the acceptability increases with subject dependencies in non-islands in Behdini. This is probably because the observations from the filler-gap literature that subject relative clauses are known to be interpreted more easily than object relative clauses, especially in the higher subject position (Shlonsky, 1992). Also, Highest Subject Restriction can be argued not to apply to Behdini; this will be discussed in details in the discussion section. The higher probability of a rejection of RPs in subject dependencies is actually compatible with the Highest Subject Restriction. This might seem contrary to the suggestion made here that Highest Subject Restriction does not apply to Behdini. However, if the Highest Subject Restriction was fully operative, then one might expect that the rejection probability should have been even higher. The interaction between argument structure and dependency type (object vs. subject) is significant both quantitatively and qualitatively.

4.5.7.2.2.3 Behdini subset of data including only object relative clauses

This subset of data looks at only relative clauses in Behdini to compare the acceptance of resumptives and gaps in island and non-island conditions, because in this subset we have fully-crossed factors. It also contains the grammatical role factor from which possessives, oblique arguments, and subject clauses are excluded because they do not appear in islands. That is why the grammatical role corresponds only to object clauses. The dataset also involves argument structure, island, and of course chain foot. The distribution of the relative clauses subset of data is shown in Table 4-4.

The factors that control the variance of the data in the relative clauses subset of Behdini data are included in the following formula:

rating ~ chain.foot * island + argument.structure * chain.foot + (1|mother.sentence)

The formula indicates that the interaction of chain foot (whether there is gap or resumptive) and island (whether the clause is island or non-island) is taken into account in addition to the interaction of argument structure (accusative vs. ergative case) and chain foot. These are all fixed effects. The last element, (1|mother.sentence), is a random effect.

Table 4-32 shows the coefficients for the random effects part of the modeling in the relative clauses subset of Behdini data in order to see if there is any individual variation. Therefore, the inclusion of random effects in the models is a necessity. The table shows that the mother sentence effect allows for the data to vary with the standard deviation measured as 0.268. Participant, on the other hand, has no significant effect on the data variation as it leads to increase the AIC value with -1.3.

Table 4-32: Coefficients for the random effects for the Behdini subset of relative clauses

Random effects:			
Groups	Name	Variance	Std.Dev.
mother.sentence	(Intercept)	0.0718	0.268

Table 4-33 lists the reduction of AIC in an ANOVA comparison for the significant factors that were added to build the optimal model in the relative clauses subset of data. The interaction of (chain.foot * island) scores the largest reduction in AIC with 79.2. This is followed by chain.foot as a main effect with 47.7. This is followed by the three-way interaction of chain.foot, island, and argument.structure with 35.7. Island on its own was ineffective as it increased the AIC with -2. The other fixed factor that ended up being insignificant was verbal agreement as it increased the AIC with -1.9.

Table 4-33: Model comparison statistics for the Behdini subset of object relative clauses

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1317	1685.9	1	1679.9	1.95e-12 ***	47.7
chain.foot + island	1316	1687.9	2	1679.9	0.8532	-2
chain.foot * island	1315	1606.7	2	1596.7	< 2.2e-16 ***	79.2
chain.foot * island + Verbal. Agreement	1314	1608.6	3	1596.6	0.8087	-1.9
chain.foot * island * argument.structure	1311	1571.0	3	1553.0	7.683e-09 ***	35.7

Table 4-34 previews the coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for chain foot is gap, for island is no, and for argument structure is accusative. As for rating, the reference level is calibrated for A, which corresponds to full grammaticality and thus a degraded acceptability is denoted.

Table 4-34: Coefficients of a generalised linear mixed model fitted to the acceptability data for object relative clauses in Behdini (Reference levels: chain.foot: gap, island: no, argument.structure: accusative)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.2146	0.1557	1.378	0.168
chain.footresumptive	0.7901	0.1839	4.298	1.73e-05 ***
islandyes	1.1408	0.2661	4.288	1.81e-05 ***
argument.structureergative	-0.6755	0.1646	-4.105	4.05e-05 ***
chain.footresumptive:islandyes	-2.4987	0.2759	-9.057	< 2e-16 ***
chain.footresumptive:argument.structurergative	1.6185	0.2522	6.418	1.38e-10 ***

Figure 4-7 plots the coefficients involved in the optimal model for the relative clauses subset of the Behdini data, showing the interaction of chain foot, island, and argument structure in Behdini relative clauses.

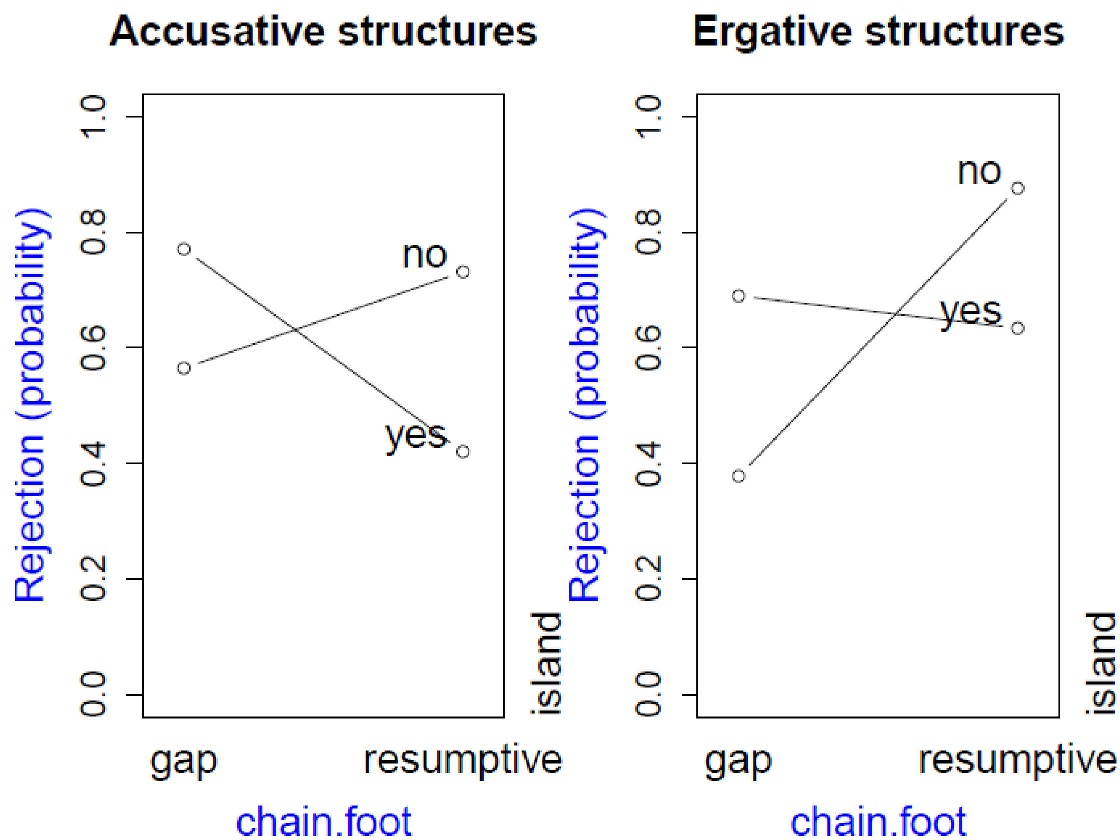

Figure 4-7: Interaction of chain foot, island and argument structure in object relative clauses in Behdini (Reference levels: chain.foot: gap, island: no, argument.structure: accusative)

Figure 4-7 visualizes the interaction between chain foot (whether there is gap or resumptive), island (whether there is island (yes) or non-island (no)), and argument structure (whether the structure is accusative or ergative) in object relative clauses in Behdini.

The figure indicates that Behdini speakers never fully accept relative clauses even when they are not in islands, and especially if they contain an RP. This is a surprising finding that will need further research (as it would go beyond the scope of this thesis). In non-islands the preference goes in the same direction as in English (i.e. gaps are preferred over RPs), but it is much less categorical. It is, nonetheless, significant in accusative clauses (Z value = 4.297, $p < 0.001$). It was significant in ergative clauses as the model was refitted with ergative as reference level, and the effect size for chain.footresumptive is (Z value = 11.396, $p < 0.001$).

Similarly to English speakers, Behdini speakers prefer resumptives in islands, meaning that RPs marginally rescue islands. This is further indicated in Table 4-34 regarding the interaction of chain foot and islands in Behdini relative clauses, which shows that the acceptability rate significantly increases when there are RPs in islands, as the estimate of chain.footresumptive:islandyes values at -2.4987 and the effect size is (Z value = 9.057, $p < 0.001$).

It could be argued that there is a certain level of optionality between gaps and RPs in Behdini (at least in accusative structures). In ergative structures, RPs are almost categorically rejected. This could be due to the presence of an agreement marker on the verb, which is effectively interpreted as an RP.

In islands, the preference for RPs (seen in accusative structures) is almost cancelled by the preference for gaps in ergative structures. Hence, there is no significant difference in acceptability between gaps and RPs in ergative structures.

To sum up, Behdini does not allow gaps to the extent that English does, but it goes in the same direction of preferring gaps over RPs in non-islands. Acceptance of gaps is however marginal in non-islands, which suggests that Behdini does not feature the same type of wh-chains as English.

4.5.7.2.2.4 Behdini subset of data including only islands

This subset of data looks at only island clauses to compare the use of resumptives and gaps in all island types based on the origin.clause factor (the four types of islands). This subset of data includes adjuncts, sentential subjects, relatives, and wh-clauses. The island relative clauses are embedded in presentative or wh-structures in the island condition, and this is captured by the Movement Type variable.

With respect to the distribution of the data, as shown in Table 4-5, all the data are islands in which possessive, oblique, and subject arguments are removed. This is because none of oblique arguments and subject clauses appear in islands. So this subset includes only object clauses.

The best model for the islands subset of the Behdini data is included in the following formula:

rating ~ origin.clause * chain.foot + argument.structure + (1|mother.sentence)

The formula indicates that acceptability varies according to an interaction of chain foot and origin clause and according to the main effect of argument structure. These three elements form the fixed-effect factors that control the variability in the islands subset of the Behdini data and make up the optimal model. As for (1|mother.sentence), it is treated as a random effect.

Table 4-35 lays out the coefficients for the random effects in the islands subset of the Behdini data to detect any individual variations based on participants and item numbers. The table shows that the mother sentence effect, representing the item numbers in this analysis, allows for data to vary with the standard deviation measured as 0.2477, whereas the participant shows no variation in the subset of islands data in Behdini as it increases the AIC with -2.

Table 4-35: Coefficients for the random effects for the Behdini subset of islands

Random effects:			
Groups	Name	Variance	Std.Dev.
mother.sentence	(Intercept)	0.06133	0.2477

Table 4-36 is an ANOVA comparison that lists the reduction in AIC for the significant factors that were added to build the optimal model in the islands subset of Behdini data. The table shows that the two factors of chain foot and origin clause as main effects are the most important factors in the model because they have scored the highest rate of reduction in AIC with 15.5 and with a significant p-value equaling $p < 0.00008162$. This is followed by chain foot as a main effect with 12.7 as reduction in AIC. This is followed by the three factors of chain foot, origin clause, and argument structure with 8.6 as reduction in AIC. Finally, chain foot and origin clause in interaction come at the end with 8 as reduction in AIC. Including argument structure into the nteraction with chain foot and origin clause increased the AIC with -1.3. Movement type also scored a lower AIC as it increased with -2.

Table 4-36: Model comparison statistics for the Behdini subset of islands

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
chain.foot	1557	1809.6	1	1803.6	< 2.2e-16 ***	12.7
chain.foot + origin.clause	1554	1794.1	2	1782.1	8.162e-05 ***	15.5
chain.foot * origin.clause	1551	1786.1	2	1768.1	0.002855 **	8
chain.foot * origin.clause + argument.structure	1550	1777.5	3	1757.5	0.00118 **	8.6
chain.foot * origin.clause * argument.structure	1543	1778.8	3	1744.8	0.07848	-1.3
chain.foot * origin.clause + argument.structure + movement.type	1549	1779.5	4	1757.5	0.7674	-2

Table 4-37 shows the coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for chain foot is gap, for origin clause is relative, and for argument structure is accusative. As for rating, it is A which denotes full acceptability.

Table 4-37: Coefficients of a generalised linear mixed model fitted to the acceptability data for islands in Behdini (Reference levels: Chain.foot: gap, origin.clause: relative, argument.structure: accusative)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.8109	0.2274	3.565	0.000363 ***
origin.clauseadjunct	-0.4919	0.2871	-1.714	0.086603
origin.clausesentential.subject	0.1506	0.3161	0.476	0.633865
origin.clausewh.clause	1.2422	0.3635	3.417	0.000633 ***
chain.footresumptive	-0.8860	0.2261	-3.918	8.92e-05 ***
argument.structureergative	0.3766	0.1164	3.234	0.001219 **
origin.clauseadjunct:chain.footresumptive	0.9594	0.2963	3.238	0.001204 **
origin.clausesenten.subject:chain.footresumptive	0.1267	0.3242	0.391	0.695900
origin.clausewh.clause:chain.footresumptive	0.8252	0.4152	1.987	0.046897 *

Figure 4-8 is a visual representation showing the interaction of chain foot (gap or resumptive) and origin clause (the four types of islands) in Behdini island configurations.

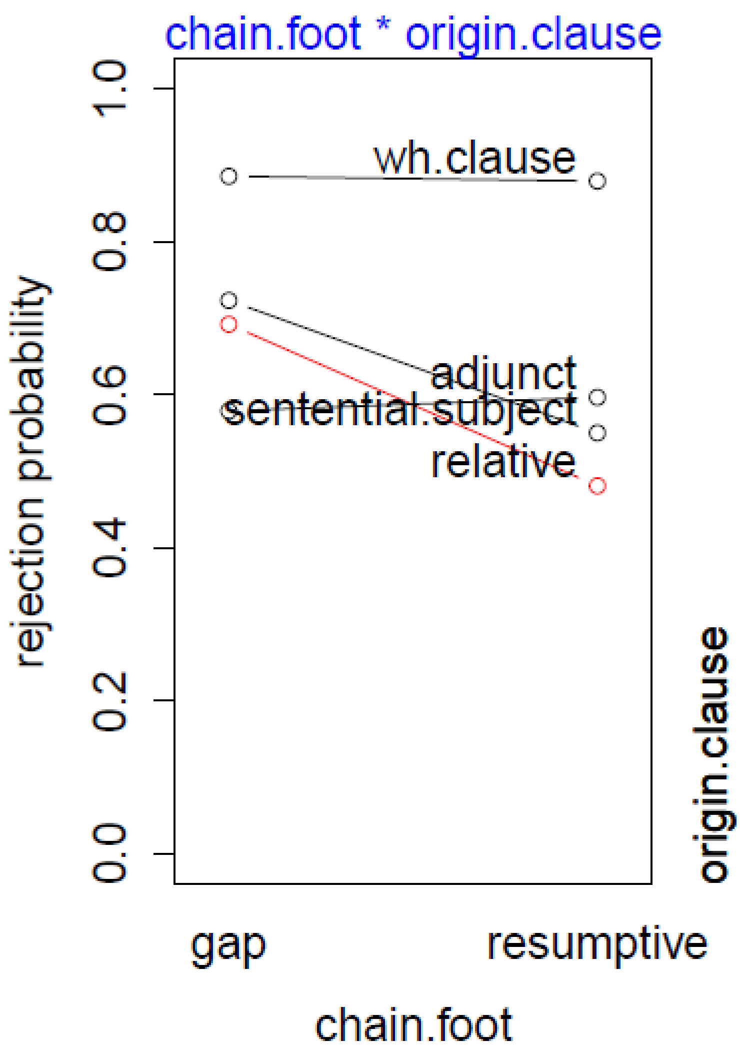

Figure 4-8: Behdini object islands rejection probability

Figure 4-8 visualizes the distribution of resumptive pronouns and gaps all over the four types of islands in Behdini, which are relative, sentential subject, adjunct, and wh-clause islands. The red line indicates the reference level.

The figure shows that there is a main effect of island types, with wh-structures rejected significantly more than any of the other structures. This is indicated in table 4-37 as the estimate value of origin.clausewh.clause is 1.2422, and the effect size is (Z value = 3.417, $p < 0.001$).

There is an interaction of island type and chain foot: Sentential subject and relative clauses pattern alike in that the presence of an RP decreases rejection rates. The effect size of origin.clausesentential.subject:chain.footresumptive is (Z value = 0.391, $p < 0.001$), meaning that RPs yield a high acceptability rate in sentential subject islands. Table 4-37 also indicates that RPs are accepted more than gaps in relative islands as the effect size of chain.footresumptive is (Z value = -3.918, $p < 0.001$).

By contrast, the presence of an RP yields no improvement in adjunct clauses and wh-structures. Based on two refitted models once with adjunct as reference level and once with wh-clauses as reference levels, it was shown that the effect size for the presence of RPs in adjunct island clauses is (Z value = 3.238, $p < 0.001$). As for wh-clause islands, the effect size for the presence of RPs is (Z value = 1.987, $p < 0.001$). This means that RPs are rejected more than gaps in adjunct and wh-clause islands.

These differences in acceptability among island types in Behdini indicate that there are three island types (namely, sentential subjects, relatives, and wh-clauses) which show an effect of the interaction of RPs and islands in Behdini and only in these island types RPs appear to yield a higher acceptance. However, in adjuncts there is no effect for the interaction of RPs and islands as gaps are preferred in these clauses. However, if Behdini was marginally sensitive to islands, the rejection rates would be much lower. In fact, the relatively high rejection rates with gaps suggest that Behdini does feature wh-movement after all. And the use of RPs tends to improve acceptability at least in some structures.

4.5.7.2.3. A Grammaticality and Coreference Test

The diagnostics of apparent resumptives also include the behaviour under reconstruction and whether apparent resumptives can be bound by a quantificational antecedent because, as mentioned in section 4-2, apparent RPs must show reconstruction and apparent resumptives can be bound by a quantificational antecedent (Chao and Sells, 1983; Sharvit, 1999; Hendrick, 2005). These two particular diagnostics have been tested in separate JETs with English and Behdini speakers.

This test includes a JET involving grammaticality and coreference (i.e. binding). It contains the items for which the interpretation of the resumptive pronoun needs to be checked (i.e. is it really bound by the antecedent that is assumed for?). The main reason behind this different test is to investigate whether Behdini and English RPs can be bound by quantificational antecedents and to test the reconstruction effects too, as shown in Table 4-38 below.

Table 4-38: Experimental conditions and test items for the reconstruction effects and the quantificational antecedents JET

Experimental conditions	Type of test items	The purpose
Do Behdini and English RPs demonstrate reconstruction effects?	RPs in sentences demonstrating reconstruction effects.	To investigate whether RPs in Behdini and English demonstrate reconstruction effects, which is a main feature of apparent resumptive languages.
Can RPs be bound by quantificational antecedents?	RPs bound by quantificational antecedents.	In apparent resumptive languages, RPs can be bound by a quantificational antecedent. However, in languages featuring intrusive pronouns, RPs cannot.

The sentence in 114.a is an example for an RP under reconstruction effects, and 114.b is an example for an RP bound by a quantificational antecedent. (For detailed Behdini and English examples on all the structures mentioned for the

JET testing the reconstruction effects and quantificational antecedents, see Appendix 6).

(102) a. Her bad student, we don't want to tell any teacher that he cheated on the exam.
b. Every man, you were upset because he went without saying goodbye.

20 native speakers of Behdini and 20 native speakers of English participated in the experiment. There were ten test items for RPs under reconstruction effects and ten for RPs bound by quantificational antecedents. It is worth mentioning that English and Behdini test sentences were fully equivalent, i.e. one translated from the other. This experiment was tested according to the following response categories:

A. I can interpret the underlined word as the word mentioned under A.
B. I can interpret the underlined word as the word mentioned under B.
C. I can interpret the underlined word as somebody not mentioned in the sentence.
E. I do not think anybody could say this sentence.

The first option tells that the RP is really bound by the antecedent that is assumed, i.e. the antecedent which is within the head RP (this antecedent is the first option mentioned in the sentence). Option B indicates that the RP is bound by the antecedent which is outside the head RP (this is considered the control option). Option C allows for contextual discourse factors to have an impact. Option E indicates that the sentence is ungrammatical. The informants could choose several options. Tables 4-39 and 4-40 contain results for each condition in Behdini and English.

Table 4-39: Raw figures and percentages of the Behdini results

Conditions	Rating A		Rating B		Rating C		Rating D	
	%	#	%	#	%	#	%	#
Reconstruction effects	95%	190	0%	0	6%	12	7%	14

Quantificational antecedents	93%	186	0%	0	8%	16	5%	10

Table 4-40: Raw figures and percentages of the English results

Conditions	Rating A		Rating B		Rating C		Rating D	
	%	#	%	#	%	#	%	#
Reconstruction effects	68%	136	4%	8	48%	96	93%	186
Quantificational antecedents	67%	134	0%	0	24%	48	91%	182

As shown in Tables 4-39 and 4-40, 95% of Behdini participants selected option A for RPs in sentences demonstrating reconstruction effects, and only 7% selected option C for ungrammaticality. This suggests that Behdini RPs show reconstruction effects and thus demonstrate an apparent resumptive nature. As for English, 68% of the participants selected option A for RPs in sentences demonstrating reconstruction effects, whereas the vast majority with 93% selected ungrammaticality as well. The tables also show that 93% of Behdini participants selected option A for sentences in which RPs are bound by quantificational antecedents, and only 5% rejected the grammaticality of these constructions. This indicates that Behdini speakers selected RPs as referents for quantificational antecedents. As for English, 91% of the participants selected option D denoting ungrammaticality and 67% selected option A.

The results above are visualized in Figures 4-9 for reconstruction effects and 4-10 for quantificational antecedents in Behdini and English.

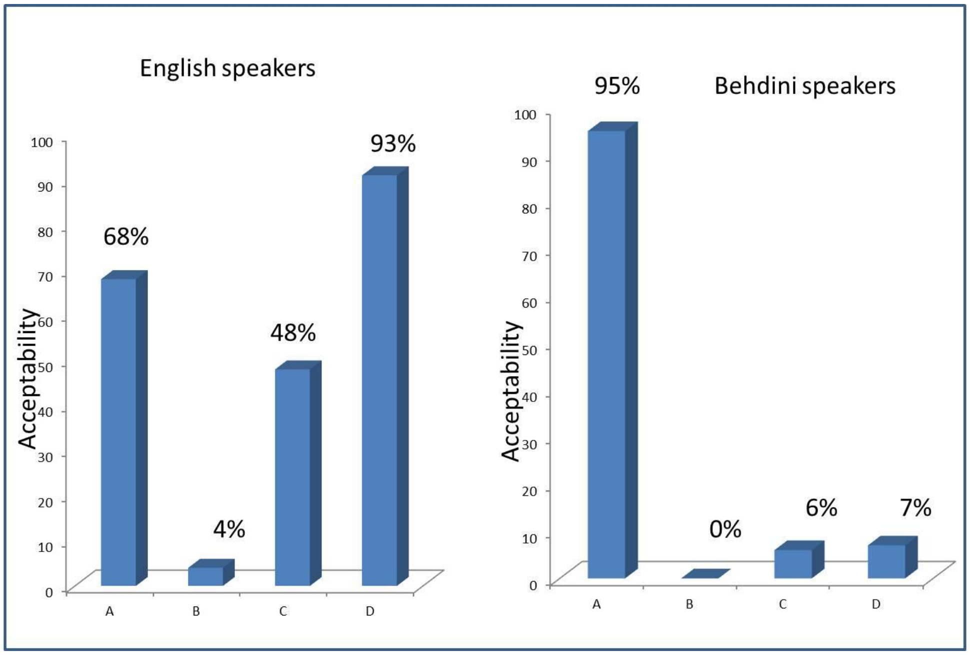

Figure 4-9: Behdini and English ratings for RPs under reconstruction effects

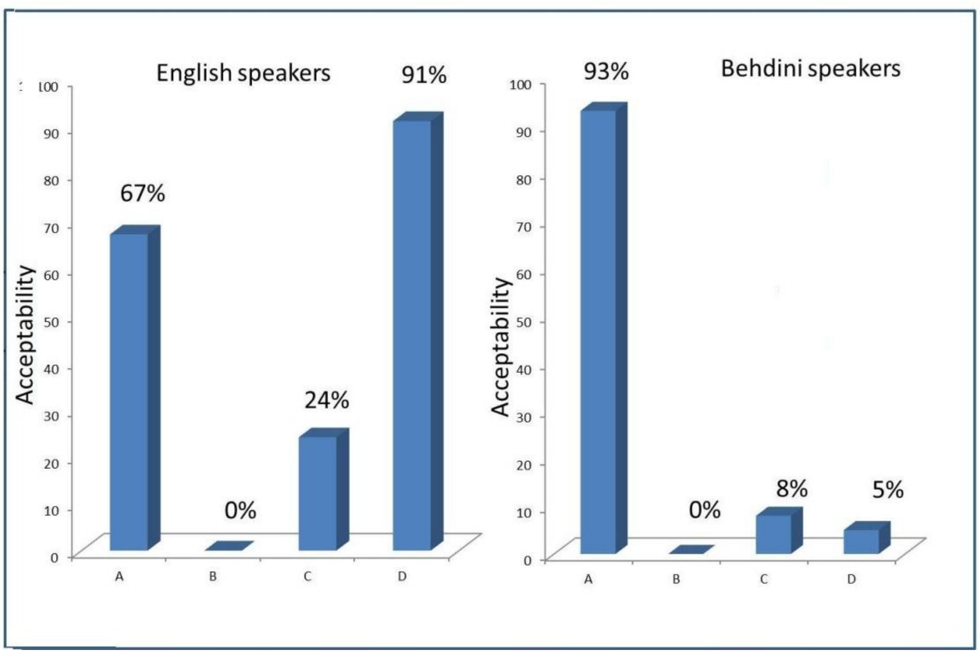

Figure 4-10: Behdini and English ratings for RPs bound by quantificational antecedents

4.5.7.2.4 General Discussion

This acceptability judgement task addressed the issue of RPs and gaps acceptance in English and Behdini in order to confirm the status of RPs in Behdini and English. It included native speakers of Behdini (n=30) and English (n=24). The judgement was based on a 4-point rating scale. 128 test items (quasi-literal translation from English to Behdini) were presented based on 32 "mother sentences," each presented in four variants (+/- RP, +/- [past]). Analysis was by generalised linear mixed model with binomial link function (response variable transformed in (log) probabilities of a reduction in acceptability), with full acceptability as reference level.

This section is structured around the original research questions, listed in (4.5.1). It is an attempt to provide adequate answers to those questions one by one. First, the diagnostics determining whether Behdini features apparent resumptives and confirming that English features intrusive resumptives will be discussed. This will be followed by discussing the effect of split-ergativity in Behdini. Based on that, we will reach a coherent and comprehensive picture on the precise nature of RPs in both English and Behdini. Then the issue of variation will be addressed, which is determined by morpho-syntactic rules (i.e. in possessive structures), across structural positions (e.g. Higher Subject Restriction), and with respect to islands. Finally, what the Behdini learners of English have to acquire will be clearly summarised.

Based on this discussion, a number of L2 acquisition predictions will be laid out in the subsequent section. This is because English RPs and Behdini RPs share some similar and different features within relative clauses and in islands. Comparison and contrast between RPs in the two languages are, therefore, an essential basis for the L2 study.

4.5.7.2.4.1 The status of RPs in English and Behdini

The first research question states: "What are the types of RPs featured in Behdini and English?" This question seeks to elucidate the type of RPs featured in English and Behdini. For answering this research question, we will go through the diagnostics of apparent and intrusive RPs established in (4-2).

4.5.7.2.4.1.1 English

In English, the analyses do not suggest any optionality for the use of RPs and gaps in non-islands, and gaps are used obligatorily all over the non-island structures (see Figures 4-1 and 4-2, and Table 4-7). This goes in line with the diagnostic of intrusive pronouns that there is no true optionality between intrusive pronouns and gaps. This does not allow RPs in non-island conditions.

Intrusive pronouns appear in islands to marginally rescue their grammaticality. Even though no previous experiments in English have proved the reality of the interaction of RPs and island effects, this JET demonstrates that English participants prefer RPs over gaps in island relative clauses, but they prefer gaps over RPs in non-island relative clauses (see Figure 4-4). This is in line with the diagnostics of intrusive pronouns that RPs are not tolerated in English relative clauses unless they are in island configurations (Sells, 1984; McCloskey, 2002).

Intrusive pronouns cannot be bound by quantificational antecedents. As shown in Tables 4-39 and 4-40 and Figures 4-9 and 4-10, in the separate coreference JET that has been conducted for testing reconstructions effects and quantificational antecedents, the results confirm that English cannot be bound by quantificational antecedents (Sells, 1984: 453; Erteschik-Shir, 1992: 92).

Intrusive pronouns do not strictly obey the highest subject restriction, meaning that RPs might appear in subject positions. This means that in English islands even the subject position might allow RPs to be used. However, this study lacked islands with subject position; all island configurations were in object dependencies.

Therefore, it is confirmed that English features intrusive pronouns (Sells, 1984) as the last-resort rescue of a move operation (McCloskey, 2002).

4.5.7.2.4.1.2 Behdini

4.5.7.2.4.1.2.1 Resumptive pronouns

The diagnostics of apparent RPs are listed below:

a) There is true optionality between apparent RPs and gaps.
b) Apparent RPs are obligatory in islands.
c) Apparent RPs obey the highest subject restriction meaning that a subject gap cannot be replaced by a resumptive element.
d) Apparent RPs show reconstruction effects.
e) Apparent RPs can be bound by a quantificational antecedent.

It is to be noted that two different tests are used for investigating the diagnostics of apparent RPs. Diagnostics (a, b, and c) will be investigated by the main JET of the study, wheareas diagnostics (d and e) will be investigated by a different test.

(i) diagnostics a, b, c

RPs are not truly optional in Behdini, but they are less marked than in English, and subject to complex variability patterns (which appear to be associated with the interaction of split ergativity and the higher subject restriction, as will be discussed in more detail below). The only non-variable case is possessive structures, which show categorical requirement for RPs (see Figure 4-5).

Apparent RPs should be obligatory in islands. However, the results of the Behdini data are not compatible with this diagnostic because RPs do not rescue islands involving wh-clauses and adjuncts. Behdini speakers generally accept RPs more than gaps in sentential subject and relative island clauses, but they accept gaps more than RPs in adjuncts and they accept gaps and RPs equally in wh-clauses (see Figure 4-8). Thus, Behdini seems to be partially sensitive to the interaction of resumptives and islands. So, contrary to this diagnostic, RPs are not used in island structures obligatorily, and they are not restricted only to islands.

There is, however, a significant preference for gaps in non-islands and for RPs in islands. (This will be further discussed at the end of this section within the discussion of the variation issue.)

Apparent RPs obey the highest subject restriction, meaning that a subject gap cannot be replaced by a resumptive element. However, if we look at the effect of grammatical role (subject vs. object) on non-island relative clauses, resumptives in Behdini are rated slightly higher in subjects than in objects (Figure 4-6). This seems contradictory with this diagnostic of apparent RPs. However, this can be explained with the highest subject restriction as RPs are not allowed to appear in highest subject positions, and this will be dealt with in detail within the discussion of the variation issues at the end of this section.

(ii) diagnostics d, e

The diagnostics of apparent RPs also include their behaviour under reconstruction and whether apparent RPs can be bound by a quantificational antecedent because, as mentioned in section 4-2, apparent RPs must show reconstruction and apparent resumptives can be bound by a quantificational antecedent (Chao and Sells, 1983; Sharvit, 1999; Hendrick, 2005). These two particular diagnostics have been tested in a separate JET that also included coreference or binding. The results clearly show that in Behdini RPs show reconstruction effects (see Figure 4-9) and RPs are bound by quantificational antecedents (see Figure 4-10).

4.5.7.2.4.1.2.2 Variability in the acceptability of RPs

The results of this JET have revealed a complex picture rather than a straightforward answer to the original research questions. Behdini does not seem to fit neatly into the categories postulated at the outset.

RPs are not truly optional in Behdini, but they are less marked than in English, and subject to complex variability patterns (which appear to be associated with the interaction of split ergativity and the higher subject restriction). The only non-variable case is possessive structures, which show categorical requirement for RPs.

The analysis of Behdini results do not completely match with the diagnostics of apparent resumptives because of three main points: First, RPs are obligatory in possessive structures, and this does not fall in line with the true optionality condition. Second, RPs are possible in the subject position, which violates the diagnostic that the subject gap cannot be replaced by a resumptive element in the highest subject position of relative clauses as a direct consequence of economy principles. Third, Behdini RPs are not obligatory in contexts where the use of a gap is impossible (such as syntactic islands).

To account for the issue of variation, we will discuss the three points mentioned above. Regarding the issue of possessive structures, it is determined by morpho-syntactic rules (i.e. in possessive structures). In the possessive structures, Behdini speakers accept RPs and they reject gaps categorically (see Figure 4-5). This confirms that resumptives are obligatory in possessive (or NP-internal) structures. The subset of data including only possessives confirms that there is no variance in the Behdini possessive clauses in terms of argument structure (or tense variation). Therefore, regarding possessive structures and in contrast to RPs in English, RPs in Behdini behave quite differently. The findings show that RPs are obligatory in Behdini possessive structures, whereas gaps are obligatory in English possessive structures. So this shows that possessives are an exception and that they behave completely differently to the rest of structures. In Behdini (as shown in 103) possessives are structured as a noun phrase *jin-a wî* 'wife of him' with an obligatory presence of a prepositional element (which is a genitive connecting particle). And as discussed in Chapter 2, preposition stranding is impossible in Behdini wh-dependencies (2-4). The impossibility of preposition stranding in Behdini wh-dependencies (i.e., an obligatory presence of a preposition) requires the use of resumptive pronouns. That is why 104 with a gap in ungrammatical.

(103) Ew zelam-ê ku min jin-a wî dît-î. (NP-internal with RP)
Det man-EZ.M Com I:OBL wife-EZ.F him see.PAST-3SG
'the man that I saw the wife of him.'

(104) *Ew zelam-ê ku min jin-a __ dît-î. (NP-internal with gap)
Det man-EZ.M Com I:OBL wife-EZ.F __ see.PAST-3SG
'the man that I saw the wife of __.'

This is the only case in which the parametric difference between Behdini and English appears lexical in nature; the evidence for this is that in the case of NP-internal positions, in which RPs are obligatory in Behdini, the noun complement is actually a preposition complement (that is, in Behdini, the phrase 'the man's wife' corresponds to 'the wife of the man'). Behdini is endowed with certain properties that as were mentioned earlier restrict syntactic wh-movement in certain positions. English seems to lack these properties as movement is always allowed from direct object and oblique positions, and hence an RP cannot be inserted. RPs will be present in island contexts, since movement is blocked in these cases. Intrusive resumptive pronouns have actually been claimed to amnesty syntactic island violations, such as in the wh-island violations below (Ross, 1967; Kroch, 1981; Erteschik- Shir, 1992; Haegeman, 1994):

(105) a. This is the man whom$_i$ Emsworth told me when we will invite **him**$_i$.

b. There are always guests$_i$ who I am curious about what **they**$_i$ are going to say. (Prince (1990)'s 3a)

The resumptive pronouns here purportedly save the island violation.

The second point of variability is related to RP acceptability in Behdini (cf. non-island structures, as represented in Figure 4-6). This can be interpreted in that overall Behdini speakers prefer gaps to RPs. This is similar to what happens in English, but less categorically so: gaps are accepted less in object chains than in subject chains (especially in accusative structures), and RPs are rejected less in accusative structures than in ergative structures. It could be that the higher acceptability of subjects has to do with greater ease of processing.

Agreement reanalysis as RP may be interpreted as two possible hypotheses. (i) If reanalysis is complete and the agreement marker is fully analysed as an RP, the prediction is that the presence of a "pronominal" RP would have less of an effect both in subject chains in accusative structures and in object chains in ergative structures. This hypothesis is not verified. (ii) Alternatively, if the reanalysis process is not complete, the prediction could be that structures with verbal agreement would be rejected more, especially when they contain a "pronominal" RP. But this is only confirmed in ergative structures (and it could in fact be due to a lower acceptance of object chains over subject chains in general, as is also observed in the accusative structures).

The Higher Subject Restriction predicts that RPs should be rejected in subject chains. It is difficult to determine whether this prediction is met or not. Overall, RPs are accepted the most in subject chains in accusative structures. On the other hand, in accusative structures, the difference between gap and RP in terms of rejection rate is larger in subject chains than in object chains. This could be due to the compounding effect of the Higher Subject Restriction and a general preference for gaps. The same is not observed in ergative structures, but this could be due to presence of an agreement marker in object chains in ergative structures, which also increases the probability of rejection.

So the picture is very complex, and seems to result from the interaction of three factors: (i) the overall preference of gaps over RPs in non-islands (with object chains in accusative structures as the "default case"), (ii) the effect of the Higher Subject Restriction (which, in subject chains, has a compounding effect on the tendency to reject RPs), and (iii) the reanalysis of agreement morphemes as RPs (which, in object chains in ergative structures, has a compounding effect on the tendency to reject RPs). It is possible that the reanalysis of agreement markers as RPs is a change in progress in Behdini, which would also explain the variation in rejection rates. Further research will be necessary to confirm the analysis sketched above.

Finally, regarding the third point of variability, for Behdini RPs to be classified as apparent resumptives, RPs should have been obligatory in islands. However, RPs are not obligatory in islands in the sense that they do not fully rescue island structures. In some islands (wh-clauses and sentential subjects), they appear to have no effect at all. In other islands (relative clauses and adjunct clauses), the use of RPs significantly improves acceptability, as is the case in English. When it comes to the interaction of resumption and island effects, Behdini is only partially sensitive to the effect of islands. Whether inside or outside island structures, resumptive pronouns seem to be interchangeable with gaps, and acceptance levels remain high (this is discussed in details in the next subsection).

Therefore, in addition to the general typological properties of English and Behdini, there are other mechanisms that predict the preference of RPs in both languages. In English, RPs are preferred in island conditions to rescue island violations. RPs are allowed in Behdini relative clauses to a greater extent than in English. In Behdini there are restrictions on the use of RPs in certain structural positions including possessive and subject positions. Verbal agreement in Behdini licenses RP omission based on ergative case marking for objects, but not on accusative case marking for subjects. However, in ergative clauses object RPs are rated higher than RPs in subject dependencies.

The last point might suggest that verb-object agreement acts like a resumptive in ergative clauses (Barbosa 1995, Alexiaddou & Anagnostopoulou 1998). On the other hand, the verb-subject agreement in accusative clauses does not pattern like a resumptive pronoun as RPs in subject accusative clauses did not yield a high acceptance rate.

Behdini results also show a difference between ergative and accusative structures ratings. The accusative structures get rated higher than the ergative ones (whether it is a subject or an object) with a slightly higher acceptance for subject clauses over object clauses. Therefore, there is a variation based on the effect of the two predictors of argument structure, on the one hand, and grammatical role, on the other.

To explain the effect of argument structure, one could postulate that the accusative structures (operationalized on the basis of non-past clauses) are the ones that are the most common because people generally talk in present tense and future time more than in past. However, for this to be the case we would expect that in English the sentences in the non-past tense would be rated higher somehow than the sentences in the past. Yet, this is not the case because in English tense distinction (based on the past and non-past distinction) has no effect on the ratings in non-island relative clauses. It is, therefore, unlikely that tense properties per se are responsible for the effect observed. However, it remains possible that accusative structures are perceived as less marked by sheer virtue of their higher frequency compared with ergative structures. This will need to be investigated in further research.

So it cannot be concluded that the preference of accusative over ergative structures is just due to the effect of tense itself, as otherwise similar patterns of judgements should have been observed in English. It is concluded that in object chains, however, the agreement morpheme on the verb appears to fulfill the role of identifying the referent of the gap (Barbosa, 1995; Alexiaddou & Anagnostopoulou, 1998). This effectively makes the RP redundant, hence rejected by the informants. In subject chains, however, in spite of the presence of an agreement morpheme identifying the referent of the gap, RPs remain acceptable. To speculate as to why that might be the case, future research will be necessary to elucidate this point.

4.5.7.2.4.2 Island effects in English and Behdini

Based on the results of the Behdini and English experiments, it was shown that English is sensitive to the interaction of islands and resumptives, whereas this sensitivity is less in Behdini. In this subsection, this observation will be discussed in details by linking it to the literature on sensitivity to island effects. Sprouse and Hornstein (2013) state that in terms of the interaction of RPs and island effects, McCloskey (2006) identifies three types of languages:

Type 1: Free-variation languages

In this type of language, exemplified by Irish, RPs are in free variation with gaps when the RPs and gaps appear outside island structures, as in (106).

(106) a. an ghirseach a ghoid na sí __
the girl C stole the fairies
'the girl who the fairies stole __'

b. an ghirseach a ghoid na sí í
the girl C stole the fairies her
'the girl who the fairies stole her'

Inside of island constructions, RPs and gaps are in complementary distribution, i.e., gaps cannot appear inside island structures (107a), but RPs can (107b).

(107) a. teach nach n-aithneochthá cá rabh sé
house neg recognize where was it
'A house that you wouldn't recognize where it was'

b. *teach nach n-aithneochthá cá rabh __
house neg recognize where was __
'A house that you wouldn't recognize where __ was'

Type 2: Restricted distribution languages

In this type of language, exemplified by Vata (a North African language), RPs and gaps do not vary outside island configurations. In Vata, RPs only appear in subject positions, whereas gaps only appear in non-subject positions.

(108) a. ălÓ Ò nÙ mĺ la [resumptive]
Who he did it WH
'Who did it?'

b. *ălÓ __ nÙ mĺ la [gap]
Who __ did it WH
'Who did it?'

(109) a. *yI Kòfí nÙ mí la [resumptive]
what Kofi did it WH
'What did Kofi do?'

b. yI Kòfí nÙ __ la [gap]
what Kofi did WH
'What did Kofi do?'

The effect of islands in languages like Vata lies in the fact that RPs cause unacceptability in relative clause islands (110a), but they are acceptable in WH-islands (110b).

(110) a. yI n gugu na Kòfí yÉ yO-O mOmO ă nyE-bO__yo-yo__yi
what you think NA Kofi saw chaild HIM we gave-RFL__chaild__what
yé la
PART WH
'What do you think that Kofi saw the child who we gave __?'

b. ălÓ n nI zE mEmE gbU Ò di-bO mÉ yí la
who you neg why it-it for he cut-RFL it know WH
'Who don't you know why he cut it?'

Type 3: Intrusive pronoun languages

This type of language, as mentioned earlier, is exemplified by English, in which RPs are not a grammatical option (111a versus 111b), but native speakers tend to produce RPs inside island structures as in (112a) in an attempt to avoid the island effects that arise when gaps appear inside islands (112b).

(111) a. That's the donkey that __ is from Brazil.

b. *That's the donkey that it is from Brazil.

(112) a. *That's the donkey that I don't know where __ is from.

b. ?That's the donkey that I don't know where it is from.

All of the three types of languages described above are in one way or another sensitive to island effects. This is because when gaps or resumptive pronouns appear inside island structures, the acceptability or unacceptability of resumptives is restricted and determined due to an island effect. In English, however, the sensitivity to island effects is more obvious because the use of RPs in island clauses is the only option to rescue the otherwise ungrammatical structures.

As far as Behdini is concerned, it is closer to type 1 languages in nature as it shares crucial features with those types of languages. However, there is a vital difference in terms of island effects which will be highlighted below.

In most structures in Behdini, RPs are in free variation with gaps both outside of island structures (as in Irish) and inside island structures.

(113) a. Ew kiç-a ku ecine __ diz-î
Det girl-EZ.F Comp fairies __ steal.PAST-3SG
'the girl who the fairies stole __'

b. Ew kiç-a ku ecine ew diz-î
Det girl-EZ.F Comp fairies her steal.PAST-3SG
'the girl who the fairies stole her'

However, as opposed to languages like Irish, in (114a) the gap grammatically appears inside an island structure in Behdini, whereas in (114b) a resumptive pronoun appears interchangeably. This makes Behdini different from the three types of languages defined by McCloskey (2006).

(114) a. Xanîyek-ê ku te ne-dizan-î __ li kîve-ye
house-DIR Comp you NEG-recognize.PAST-3SG __ LOC where-Cop
'a house that you wouldn't know where __ was'

b. Xanîyek-ê ku te ne-dizan-î ew li kîve-ye
house-DIR Comp you NEG-recognize.PAST-3SG it LOC where-Cop
'a house that you wouldn't know where it was'

Based on the speculations about Behdini that are mentioned above, when it comes to the interaction of resumption and island effects, Behdini is less sensitive to the effect of islands. This is because whether inside or outside island structures, resumptive pronouns remain essentially in free variation with gaps.

Languages that are not sensitive to islands consistently use RPs in islands. Hence, these are true pronouns rather than just the spill-out of a trace. Behdini seems strange in this respect, as it allows gaps in islands. This variation imposed by Behdini can be accounted for by the arguments made by Sprouse and Hornstein (2013) as they list a number of cross-linguistic variations in island effects that allow languages to use gaps in islands. These variations are: complementizer-trace effects, escapable relative clauses, subjacency parameter effects, variability in subject and adjunct islands, and islands in wh-in-situ constructions. They claim that island effects are approximately and relatively consistent across all the languages of the world. But there are some differences or "surprises," as they claim, that are imposed by some languages. They confirm the importance of these cross-linguistic variations theoretically. I will discuss the cross-linguistic variations that are applicable to Behdini in order to see to what extent Behdini is or is not sensitive to islands and how comparable to other languages it is in that respect.

The cross-linguistic variations observed by Sprouse and Hornstein (2013) that are applicable to Behdini are the following:

A. Complementizer-trace effects.

English and Italian differ in the acceptability of complementizer-trace effects. In English a wh-question in which the gap follows the complementizer *that* is generally unacceptable (115a), but the corresponding sequence in Italian is fine (115b).

(115) a. *Who did you say that __ wrote this book?

b. Chi hai detto che ha scritto questo libro __?

who have.2SG said that has written this book

Behdini behaves like Italian in this respect, as the gap following a complementizer-trace effect is acceptable (116). This is because Behdini and Italian allow post-verbal subjects (117), and so strings that have a complementizer-trace violation can be generated with a post-verbal gap that does not violate the constraint. And this is regarded as an instance of surface violation, rather than reflecting deeper violation in the complementizer-trace constraint.

(116) Te got kîbû ku __ ev kitêb-e nivîs-î?
you say.PAST who Comp this book-OBL write.PAST-3SG
'Who did you say that __ wrote this book?'

(117) Dê geh-in gelek ji wana.
will arrive-3PL many of them
'Many of them will arrive.'

B. 'Subjacency Parameter' effects.

Further evidence supporting the argument that Behdini is not as sensitive to islands as English is the insights drawn by Ross (1967) about islandhood. He argues that the syntactic dependencies which are sensitive to island effects might involve the syntactic operation of movement. So in the case where island effects are not present, the dependency will not be able to be derived via movement. The principle that gives regulations to the island effects is known as Subjacency by Chomsky (1973). English wh-dependencies can be exemplified here as being sensitive to islands (118a versus 118b). However, this is not the case in Behdini, in which again RPs are in free variation with gaps in such complex NPs (as in 119) and thus shows less sensitivity to islands in wh-dependencies.

(118) a.*Which book did you meet the man who wrote __?
b. Which book did you meet the man who wrote it?

(119) a. Kîj kitêb te ew zelam-ê ku nivîs-î dît?
Which book you Det man-EZ.M Comp write.PAST-3SG see.PAST
'Which book did you meet the man who wrote __?'

b. Kîj kitêb te ew zelam-ê ku ew nivîs-î dît?
Which book you Det man-EZ.M Comp it write.PAST-3SG see.PAST
'Which book did you meet the man who wrote it?'

This is an instance of deep variation in island effects in which the island allows extraction from wh-islands in Behdini (similar to Italian, French, and Spanish), something that is disallowed in English.

C. Variability in subject and adjunct islands.

This is another example of apparent deep variation in island effects which involves subject and adjunct islands. Extraction from complex subjects is not acceptable in English (120a), whereas it is possible in Russian (120b) and Hungarian.

(120) a. *What do you wish that [to buy __] would be no trouble at all?

b. Cto by ty xotel ctoby kupit' ne sostavljalo by nikakogo truda?
what SUBJ you wanted that-SUBJ to-buy not constitute SUBJ no labour
'What would you want that [to buy __] would not be any trouble?'

Behdini is different from English and similar to Russian in that an extraction from a complex subject is acceptable (121).

(121) Ew çi tişit-e tu ḧez di-key ku eger tu [__ bikirr-î]
Det what thing-COP you wishing PRST-do Comp if you buy-3SG
ne-bît-e arîşe êkcar?
NEG-become problem at all
'What do you wish that [to buy __] would be no trouble at all?'

Extraction from adjunct island conditional clauses is also not possible in English (122a) and a number of other languages such as Russian, Spanish, and Basque. However, extraction from adjunct islands is acceptable in Korean (122b), Japanese and Malayalam.

(122) a. *Which student will Quinn cry if Virginia gives a present to __?

b. Etten-haksayng-hanthey Quinn-un [manyak Virginia-ka __
which student-DAT Quinn-TOP COND_ADV Virginia-NOM

senmwul-ul cwn-myen wul-ul-ka?
present-ACC gave-COND cry-will-Q

Now, Behdini (123) is also classified within the languages that show similar behavior to Korean in this area.

(123) Kîj qutabî dê Kwîn girît eger Vîrcîniya-yê diyarî bo bibet?
Which student will Quinn cry if Virginia-OBL present to give
'Which student will Quinn cry if Virginia gives a present to __?'

Therefore, as we have seen above Behdini shares three properties with various languages that behave differently to English with respect to island effects and the allowance of gaps inside island constructions. These variations are: complementizer-trace effects, 'Subjacency Parameter' effects, and variability in subject and adjunct islands.

4.5.7.2.5 Conclusions

The results discussed above provide solid answers to our research questions. In this section a number of conclusions are drawn based on the analyses performed above in relation to the research questions, which will be restated below.

The analysis shows that RPs in possessive structures are obligatory in Behdini and gaps in possessive structures are obligatory in English. Gaps are also obligatory in other non-island structures in English. Variation is observed in all positions in Behdini except in possessive structures.

Moreover, many constraints determine the variability in each language showing certain factors that predict the use of gaps vs. RPs both in Behdini and English. The first observation is that RPs are used in English mainly to rescue island violations. This JET may be the first to demonstrate this effect which actually, contrary to the theoretical predictions, experimental studies reveal no interaction between RPs and island effects in English. As for Behdini, even though RPs can be used in islands, they are not obligatory as they do not fully rescue island structures.

Another observation from the analysis is that RPs are allowed in relative clauses in Behdini to a greater extent than in English, especially in non-islands, even though the direction of gap preference over RPs is similar in both languages.

Argument structure has an effect in Behdini, but tense distinction is not relevant in English. This is due to the findings that accusative structures are rated higher than ergative structures in both argument roles of subject and object non-island relative clauses, with a preference for RPs in object ergative clauses over subject accusative clauses in Behdini.

In summary, based on the results of our experiment and insights from the literature about resumption, a brief account on the resumptive status of the two languages in question has been provided. It was confirmed throughout the chapter that English features intrusive pronouns, which are a last resort device to overcome processing complexity and are typically restricted to islands. Behdini, on the other hand, was confirmed to be a language with grammatical RPs, which arise in chains that do not involve movement and can feature in any kind of wh-dependency. Behdini RPs can exist in syntactic islands as well. However, Behdini is not as sensitive to islands as English in terms of the interaction of RPs and islands.

Therefore, the analysis of the first study confirms the following results regarding English:

(1) There is a quasi-categorical rejection of RPs in relative clauses that are not in island configuration (Figure 4-2).
(2) There is a quasi-categorical rejection of islands with gaps (Figure 4-4). RPs partially rescue island configurations (with no significant differences between island types).
(3) There is a random individual variation (Figure 4-3).

As for Behdini, the following results are confirmed:

(1) In non-island relative clauses there is an interaction between the presence of RP and argument structure (Figure 4-6):

- Ergative clauses: Verb-object agreement acts like an RP (Barbosa, 1995).
  - Non-islands: strong preference for gaps over RPs
  - Islands: no difference between gap and RP
- Accusative clauses:
  - Non-island: marginal preference of gaps over RPs
  - Islands: strong preference for RPs over gaps

(2) In Islands:

- RPs do not rescue islands involving wh-clauses and adjuncts.
- There is no interaction between the presence of RPs and argument structure (except in relative clauses). Ergative clauses yield reduced acceptability.
- There is no significant amount of random individual variation.
- Overall, there are marginal differences between gap and RP.

In summary, the results confirm that English features intrusive pronouns as RPs are allowed to appear in island conditions. In English, gaps are used obligatorily in non-island structures. As for Behdini, RPs were proven to be obligatory in possessive structures and optional in all other structures. Moreover, RPs can be used in island structures optionally, but they are not restricted only to islands. This makes Behdini less sensitive than English with regard to the interaction of island effects and resumptives.

Finally, argument structure (accusativity vs. ergativity) and grammatical role (subject vs. object) both have an effect in Behdini. This effect is reflected in the findings which reveal that accusative structures are rated higher than ergative structures both in subject and object positions. Moreover, subject clauses are rated higher than object clauses because highest subject restriction does not seem to apply on Behdini.

4.5.7.2.6 Comparative analysis and predictions for the L2 study

The main findings of this study can be summarised as follows. Possessive structures behave entirely differently in L1 and L2: Behdini always takes RPs obligatorily but English always requires gaps. With regard to possessives, Behdini categorically requires RPs. In other structures, Behdini features optionality: gaps are preferred in some structures, but RPs are always accepted (albeit sometimes marginally). English, on the other hand, does not feature optionality. It just uses RPs as a device to rescue island violations, and generally it does not accept RPs with the above exception.

English shows a quasi-categorical rejection of RPs in relative clauses that are not in island configurations and a quasi-categorical rejection of islands with gaps. RPs in English partially rescue island configurations.

Behdini, on the other hand, shows an interaction between the presence of RP and argument structure in relative clauses. This is captured in the high acceptance of ergative object clauses, suggesting that in ergative clauses verb-object agreement acts like a resumptive (Barbosa, 1995). In non-islands Behdini shows a strong preference for gaps over RPs, whereas in islands there is no difference between gap and RP. As for accusative clauses, non-islands report a marginal preference of gaps over RPs, whereas islands show a strong preference for RPs over gaps. Islands in Behdini show that RPs do not rescue islands involving wh-clauses and adjuncts. Also, there is no interaction between the presence of RPs and argument structure (except in relative clauses). Ergative clauses yield reduced acceptability.

Concerning the status of RPs in English and Behdini, it was confirmed that English features intrusive pronouns, a last-resort device not conditioned by parametric variation (Tsimpli & Dimitrakopolou 2007). It was also confirmed that Behdini features grammatical RPs (parametric option). Distribution of RPs are conditioned by split-ergativity (Barbosa, 1995).

Now, based on the comparison and contrast of the judgement results of English and Behdini experiments, a number of predictions can be made for the SLA study of Behdini learners' acquisition of English wh-dependencies and resumption realized by intrusive pronouns. These predictions are laid out below.

1. In the early stages of acquisition Behdini learners are predicted to be transferring their Behdini grammar. Transfer of the parametric value of the L1 is, therefore, expected to occur across all of the grammar. So they will effectively have full resumptive pronouns and hardly any sensitivity to islands because Behdini is less sensitive to islands than English.
2. Possessive structures are expected to impose a parametric L1 transfer of RPs by the Behdini speakers of L2. This prediction can be linked to Gass (1979), who experimented with the acquisition of English relative clauses by adult L2 learners in an attempt to determine the nature of transfer in second language acquisition. The native languages of the learners were Arabic, Chinese, French, Italian, Korean, Persian, Portuguese, Japanese, and Thai. Gass found out that relative clauses that are restricted to *whose* (such as genitive and possessives) showed a wider likelihood for transfer to occur.
3. The expectation, therefore, is that the Behdini learners of English will transfer their RPs in all structures (especially possessives) and display reduced sensitivity to islands, even with gaps. This is especially predicted for less proficient L2ers. However, for participants with a higher proficiency score, a native-like performance is expected.
4. In relative clauses that are not islands, Behdini speakers prefer gaps over RPs, and this is similar to what we see in English. However, there is a very high tolerance for the acceptability of RPs. In other words, even though the preference for gaps over RPs is similar to what is found in English, it is crucially different in terms of how much RPs are accepted. Behdini speakers highly accept RPs even though gaps are preferred over RPs. So it is possible that the optional (marginal) acceptance of RPs in relative

> clauses be transferred into English interlanguage. This prediction is based on a number of studies investigating the influence of transfer in JETs. Even though a number of researchers (Ioup and Kruse, 1977; Tarallo and Myhill, 1983) have proposed that the use of RPs does not indicate transfer, and they have offered universalist arguments to explain that, the results of a wider range of studies have shown L1 transfer effects for languages that license the use of RPs whether optionally or obligatorily in relative clauses (such as Gass, 1979, 1983; Singler, 1988; Hyltenstam, 1984).

Optionality refers to cases in which more than one form of a certain construction exists within one grammar. This was found to be the case in our study of Behdini which showed optionality for the use of gaps and RPs in subject, object, and oblique arguments in non-island relative clauses. Even in island conditions, Behdini still shows optionality with regard to the use of gaps and RPs in that they do not fully rescue the island structures. English, on the other hand, is not classified as an optional language regarding the use of resumptives. Examples of studies that have addressed the topic of optionality in L2 acquisition are Eubank, 1996; Sorace, 1999; 2000 and Prévost and White, 2000.

Optionality in L2 acquisition has led to designing models of SLA that have proposed the existence of partial accessibility of UG (e.g. Tsimpli and Roussou, 1991; Smith and Tsimpli, 1995; Hawkins and Chan, 1997). They hypothesize that while UG constrains L2 development as well as mature L2 grammars, in the domain of parametric options, L1 properties directly or indirectly affect L2 representations even at the advanced state of development.

Tsimpli and Roussou (1991) distinguish between UG principles and parameters, and they highlight that it is the parameters that are responsible for cross-linguistic variation. And because optionality is also attested in advanced L2 grammars, so it could be argued to characterize all stages of L2 development (Sorace, 1999; 2000).

To sum up, Behdini learners of English need to achieve the following:

- They will have to re-analyse anaphoric dependencies with RP as wh-dependencies (with gap).
- They will be able to make benefit of positive evidence, which is available as RPs are marginally accepted in some wh-dependencies in English, and also partially because Behdini is optional and thus it allows for gaps to be used which render to similar structures in English.
- The Interpretability Hypothesis predicts that the RP parameter will resist resetting, as the relevant features are [-interpretable]. And this would depend on whether RPs act like pronouns (for more details, see 3.4.2).
- On the surface, object RPs are used more in ergative contexts (i.e. past-tense contexts) in Behdini, and so Behdini learners need to abandon this preference and avoid transferring it as a greater use of RPs in past-tense clauses in English.

Overall, the difference between English and Behdini seems to be confined to variability patterns rather than a clear-cut parametrical difference. Wh-chains do exist in Behdini, but the language might be undergoing grammatical change, possibly induced by the reanalysis of agreement morphemes into RPs. The findings also suggest that Behdini features anaphoric wh-dependencies. This means that Behdini features two types of wh-dependencies, and this could be captured in terms of (constrained) optionality.

Two SLA theories might make useful predictions for this study:

Firstly, the Variational Learning Hypothesis (Slabakova, 2008): Behdini features optionality (i.e. two types of wh-dependencies). So the expectation is that its optionality patterns are going to be transferred into the interlanguage of the L2 learners of English. The prediction is that Behdini learners of English will over-accept RPs and over-reject gaps, especially at lower proficiency levels.

Secondly, the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007): Behdini learners of English will not be able to fully reset the parameter that allows true RPs, because the features involved in their derivation are interpretable at LF. The prediction is that RPs will continue being over-accepted in their English interlanguage.

CHAPTER 5

SECOND LANGUAGE ACQUISITION DATA ANALYSIS: A SELF-PACED READING STUDY

The previous chapter confirmed the intrusive status of English resumption. More specifically, it was shown that English does not normally allow RPs to occur in wh-dependencies. However, English allows RPs in island conditions. As for Behdini, it was shown to feature true resumption, but that RPs are not truly optional. However, RPs are less marked than in English, and subject to complex variability patterns, which appear to be associated with the interaction of split ergativity and the higher subject restriction. The only non-variable case is possessive structures, which show categorical requirement for RPs.

The main difference between the two languages lies in the fact that in English resumptive pronouns are not a grammatical option, but a last-resort option to rescue structures that are hard to process. Whereas in Behdini, in terms of the interaction of resumptive pronouns and island effects, it was shown that RPs are not obligatory in islands in the sense that they do not fully rescue island structures. In wh-clause and sentential subject islands, they appear to have no effect at all. However, in relative clause and adjunct islands, the use of RPs significantly improves acceptability, as is the case in English.

Based on these observations, I designed a number of research questions which were included as part of a self-paced reading task (SPRT) that I conducted. In this L2 study, the focus is on the acquisition of gaps and RPs in wh-dependencies by Behdini learners of English. In the following section I present all of the pertinent predictions and hypotheses.

5.1 An Experimental Rationale and Research Questions

Parametrically, RPs are a grammatical option in Behdini but not in English; this is particularly clear in possessive structures. The variability observed depends on other factors (as mentioned above), and can be generally characterised by a higher level of acceptance of RPs in Behdini compared with English. So the main prediction is that Behdini learners of English will over-accept RPs in English, and therefore, based on SLA predictions guided by the results of chapter 4, they will need to achieve the following:

- They will have to re-analyse anaphoric dependencies with RP as wh-dependencies (with gap).
- They will be able to make benefit of positive evidence, which is available as RPs are marginally accepted in some wh-dependencies in English, and also partially because Behdini is optional and thus it allows for gaps to be used which are congruent to similar structures in English.
- The Interpretability Hypothesis predicts the RP parameter will resist resetting as the relevant features are [-interpretable]. And this would depend on whether RPs act like pronouns (for more details, see 3.4.2).
- On the surface, object RPs are used more in ergative contexts (i.e. past-tense contexts) in Behdini. Hence, Behdini learners will need to abandon this preference and avoid transferring it as a greater use of RPs in past-tense clauses in English.

5.1.1 Research Questions and Hypotheses

5.1.1.1 Research Questions

In general, the difference between English and Behdini seems to be confined to variability patterns rather than a clear-cut parametrical difference. Wh-chains do exist in Behdini, but the language might be undergoing grammatical change, possibly induced by the reanalysis of agreement morphemes into RPs. Behdini also seems to feature anaphoric wh-dependencies, i.e. Behdini features two types of wh-dependencies, and this could be captured in terms of (constrained) optionality.

Based on the above comparative account between Behdini L1 and English L2, the following two main research questions will guide the analysis in this L2 study:

1- What is the status of resumptive pronouns in the interlanguage of Behdini learners of English? In other words, how do L2 learners go from a grammar featuring apparent resumption to one featuring intrusive resumption?
2- Can Behdini learners of English acquire wh-dependencies including traces (in wh-questions and relative clauses)?

5.1.1.2 Hypotheses and predictions

This thesis considers two main SLA theories to account for the predictions in this study:

(1) The Variational Learning Hypothesis (Slabakova, 2008) based on Yang (2002): Behdini features optionality (i.e. two types of wh-dependencies), so the expectation is that its optionality patterns are going to be transferred into the interlanguage of the L2 learners of English. The prediction is that Behdini learners of English will over-accept RPs and over-reject gaps, especially at lower proficiency levels, and that RPs are going to take longer to disappear from structures in which they are sometimes licensed in English.

(2) The Interpretability Hypothesis (Tsimpli and Dimitrakopoulou, 2007): Behdini learners of English will not be able to fully reset the parameter that allows true RPs, because the features involved in their derivation are interpretable at LF. The prediction is that RPs will continue being over-accepted in their English interlanguage. The Interpretability Hypothesis also predicts that Behdini learners will accept RPs in positions where they are ungrammatical in English (especially at lower proficiency levels), such as the complement of prepositions (possessive structures).

In relation to the above two research questions, hypotheses and predictions are surmised as follows:

1. Behdini learners of English are expected to initially analyse wh-dependencies as anaphoric dependencies, resulting in:

   a. under-acceptance of structures with gaps (not involving islands).
   b. over-acceptance of structures with RPs (in and out of islands).
   c. limited sensitivity to islands (resulting in over-acceptance).

2. However, as proficiency increases,
   a. structures with gaps are expected to be accepted more (if not in islands).
   b. structures with RPs are expected to be accepted less (in and out of islands).
   c. islands with gaps are expected to be rejected more.
   d. Behdini L2ers might, however, over-accept RPs even at advanced stages of proficiency despite accepting gaps in a native-like manner. Such a case would be conditioned by difficulties in inhibiting a prominent trait of the L1 (Inhibition Hypothesis –De Cat et al., 2015).

3. The native-speaker study in the previous chapter shows that subjects in accusative and ergative structures were rated higher than objects in accusative and ergative structures in Behdini. So on the one hand, accusative structures were rated better than ergative structures, and subjects were preferred over objects, on the other. It is possible that these preferences transfer into Behdini learners' L2 English in terms of a preference for resumptives in non-past clauses over resumptives in past clauses and subjects over objects in relative clauses. Therefore, at lower proficiency levels, the tense of the clause might influence the acceptance of RPs (if the effect of ergativity transfers into their interlanguage). This could result in over-accepting RPs, especially in object past clauses.

4. In terms of the processing (i.e. RT measurement) analysis, island structures are predicted to be processed more slowly in general, both by

native speakers and by L2ers (and overall, native speakers are expected to process test items faster than the L2ers).

5. Inside islands, RPs are expected to facilitate processing
    a. by native speakers as they partly alleviate island effects.
    b. by non-native speakers for the same reason.

6. In non-island conditions, RPs are predicted to
    a. hinder processing by native speakers (due to ungrammaticality).
    b. facilitate processing by non-native speakers (due to transfer).

7. Due to the transfer of L1 processing routines, Behdini learners might process structures with RPs faster than comparable structures with gaps, even when they are ungrammatical in English (i.e. in possessive structures and in non-islands).

8. Ungrammatical sentences are expected to be processed more slowly than grammatical sentences. If this is observed in L2 learners (as it is in native speakers), this would indicate that they use the relevant grammatical knowledge during processing (Roberts, 2013). Speed of processing could therefore be interpreted as an unconscious indicator of the state of the learners’ interlanguage. If a link is observed with proficiency, the results would be compatible with an interpretation of the differences between native and non-native processing in terms of quantitative factors rather than a fundamental difference (Roberts, 2013).

9. The prediction is that rating should be negatively correlated with speed, i.e. what the participant judges grammatical should be faster to process.

10. With respect to the implicit/explicit knowledge distinction, a discrepancy between judgement and reaction times might be an indication that the

L2ers are relying on implicit knowledge to make their judgements (Williams, 2009). This prediction is supported as relative clauses and wh-dependencies are introduced in the syllabus for the students of English departments in the University of Duhok and compound and complex sentences that require relative clauses are studied thoroughly.

5.2 Design

This experiment involves a Judgement Elicitation Task, which seeks to investigate the L2ers' grammatical representations. This JET also includes the measurement of reaction times (RTs), which were measured to provide additional information regarding the processing cost of each structure. Reading speed, as a measure of processing speed, is taken to index a learner's sensitivity to morpho-syntactic information (i.e. whether they process the critical segments at a different speed, depending on whether they feature an RP, whether they are subject or object chains, whether the wh-chain is in an island condition, or whether it is outside an island condition).

So in this study, reading times have been used as a measure of the amount of processing effort required to parse the structure of interest, and in particular the segment corresponding to the foot of the chain. This is taken to provide additional insights into learners' performance in the judgement task.

The acceptability patterns, given in the experiment, will inform us about the grammatical representation of L2 learners. Based on psycholinguistic evidence from the literature, differences in grammatical representation between non-natives and natives can restrict convergence on the target language in L2 acquisition. Also, differences in language processing between non-natives and natives can limit the ultimate attainment in the L2. When the L1 and the L2 differ in syntactic constructions, there might be an influence of the L1 (see Chapter 3).

The two main dependent variables will be the ratings for the behavioural data in the sentence judgement task and reaction time. In this experiment each sentence is presented with the two main levels of the chain foot variable which are resumptive and gap, just as in the previous experiment in Chapter 4. So the two sentences are all identical except the use of resumptive or gap. Furthermore, the same pair of sentences is presented in both past tense and non-past tense. This is to track the effect of ergativity and accusativity in Behdini on the learners' process of acquiring English. In total, 34 mother sentences have been constructed and 20 distractors or item fillers were added to the stimuli sentences.

The RT methodology adopted in this study is an SPRT. This task is aimed to show which factors would affect the participants' reading times. This is the psycholinguistic part of the research alongside the JT, which only shows if Behdini speakers have acquired the correct English syntax regarding the distribution of intrusive pronouns and gaps or not.

The DirectRT programme has been used as a tool to conduct this SPRT experiment, in which participants were asked to press a button once they finished reading a given chunk in a sentence. The RT for each button press was recorded, and thus, provides insight into how fast participants process each chunk of a sentence. Longer RTs at particular positions in a sentence are thought to reflect processing cost, which could relate to the ungrammaticality of the sentence, violation of an expectation, or a reanalysis process.

I have adopted the method of presenting the test materials chunk-by-chunk rather than word-by-word. This is because most of the test sentences are too long to be presented word by word which would have made the experiment too long and tedious (Jiang, 2012: 174). Moreover, chunk-by-chunk presentation is preferred because it allows for the gap (which is a critical variable) to appear in a chunk or phrase, but not in a word by itself.

I have used what Marinis (2010: 11- 12) calls "cumulative presentation." In this type of presentation, participants first see dashes on the computer screen that correspond to the letters of the words of the sentence. When the sentence starts, they see the first chunk or phrase on the screen. When they press the button, the first chunk of words remains on the screen and the second one appears. As the sentence progresses, previous chunks or phrases remain on the computer screen and participants can go back and read previous phrases. An example of this presentation sequence is provided in (124) below for the sentence ‘Who did you think / that to nominate him / would be a disaster?’

(124) Cumulative presentation of my stimuli sentences

--- --- --- ----- ---- -- ------- --- ----- -- - --------?

Who did you think ---- -- ------- --- ----- -- - --------?

Who did you think that to nominate him ----- -- - --------?

Who did you think that to nominate him would be a disaster?

Cumulative presentation has been adopted in this study because it provides a more accurate picture of how participants process sentences on-line compared to the non-cumulative presentation. This is because in the non-cumulative presentation participants cannot go back and read parts of the sentence again. Thus, they have to depend on their memory to remember the chunks that they read, and this is something that might cause a confounding moment that cannot be controlled when it comes to measuring the speed of processing each stimuli. The cumulative presentation is more similar to the way we read sentences in real life.

Since this is a self-paced reading experiment, the RT data are collected at some position of a sentence, which shows a critical condition. Whenever possible I have kept the lexical items identical for these critical conditions in order to control the lexical properties. Marinis (2010: 14) states that there are self-paced reading studies in which one critical segment exists in each sentence that provides the crucial information for the research question. This is the case in this study, in which one critical segment is present which contains the Gap/RP position. To avoid any confounding factors in the design, such a critical segment should have exactly the same words or form minimal pairs, and that is what I attempted to keep consistent throughout the test items. The grammatical and ungrammatical versions of the sentences are presented in the following way (slashes designate units of presentation):

(125) a. Which student will you / be furious if / the principal would expel him?

b. *Which student will you / be furious if / the principal would expel?

Sentence 125b includes an island violation, which can be partly rescued with an RP at the foot of the chain. I hypothesise that the use of an RP will result in shorter reading time at that critical segment.

It is to be noted that RTs are generally analysed for only those items for which there is an accurate response to the comprehension questions that follow the stimuli (Havik et al., 2009: 85; Marinis 2010: 14; Jiang, 2012: 176). However, in this experiment the test items are not of the black and white types of responses. That is, it is not possible to determine which sentence is right and which one is wrong grammatically speaking, as the target language licenses the use of RPs only optionally and there are no clear-cut distinctions. So the RTs of all the responses are considered in the analysis.

Based on the predictions we have, the predictors and conditions designed for the dataset used in this analysis are chain foot (gap vs. resumptive), island (non-island vs. island), grammatical role (subject, object, oblique, and possessive), tense (non-past vs. past), movement type (long wh-questions, presentative relative clauses, and short wh-questions), and origin clause (adjunct, relative, sentential subject, and wh-clause). The predictors that are different from the previous experiment are described below:

1- Movement type: Short wh-questions have been added to the levels of this predictor besides long wh-questions and presentative relative clauses.

2- Proficiency: This measures Behdini participants' proficiency of English which ranged from 50% (Beginners) to 92% (Highly Proficient).

3- L1: This shows participants' first language (Behdini vs. English).

Regarding the data distribution, the test items used are based on the native-speaker study conducted in the previous chapter (see Section 4.3.3.1 for full data distribution tables). The mother sentences for short wh-questions, which were amended in this study, are divided into object chains (126) and subject chains (127).

(126) a. Which car does John buy **it**?

b. Which bike do you want **it**?

(127) a. Which student will **he** meet the dean?

b. Which player **he** wins more golden medals?

5.3 Materials, Subjects, and Method of Administration

The experiment was administered on a personal computer using the DirectRT software as a tool for the RT measurement. First, some instructions were given and then a number of example sentences were displayed. Afterwards, a trial set of four items was presented in a training session, and then the actual test instrument followed. The following paragraph was an introduction that the participants first saw on the computer screen which explains the nature of the experiment that they would take:

> A number of sentences are going to be displayed below. Read them very carefully and make sure that you have comprehended each sentence and read them as fast as possible. After you read each segment in the sentence, you need to press spacebar to continue to the following segment. After you read the whole sentence, you need to indicate whether you could say the sentence exactly as it is (option 1); or if you think the sentence is fine but complicated to understand

> (option 2); or if you think you could say this sentence but in a particular context (option 3); or if you don't think anybody could say this sentence (option 4). Just press 1, 2, 3, or 4 after reading each sentence to make your judgement (only ONE choice is allowed per sentence). Do not think too long about each sentence: just follow your intuition. This is a survey about your OWN opinion.
>
> Press spacebar to continue the experiment…

Then sentences were displayed on the middle of the computer screen, for which participants needed to press the spacebar. And each sentence was followed by the four options that were repeated after each sentence was displayed, for which participants needed to press 1, 2, 3, or 4. The actual items were displayed in a random order. For every segment in the sentence, the response RT was recorded in milliseconds, measured from the time the participant pressed the spacebar.

Our subjects were 34 native speakers of Behdini from Iraqi Kurdistan. These participants' proficiency ranged from beginner to advanced (see Figure 5-1). This was based on the USE OF ENGLISH proficiency test authenticated by Cambridge and Oxford universities (see Appendix 7). The participants took this test for 20 to 30 minutes prior to the computerised part of the experiment in a separate session. 16 of the Behdini subjects were males and 18 were females. 15 males were right-handed and 1 was left-handed. 17 females were right-handed and 1 was left-handed. Their ages ranged from 18 to 23 with the average of 20 years old. All of the 34 Behdini informants were undergraduate students at University of Duhok, School of Humanities, from two Departments, English and Translation, having English as their second language. All of them use English daily.

Our native English speaking group included University of Leeds and University of Surrey students, professors, and others we were able to recruit individually. All were adults. There were 20 native speakers in all (10 men and 10 women). 8 males were right-handed and 2 were left-handed, whereas 5 females were right-handed and 5 were left-handed. They ranged in age from 18 to 67 with the average of 32 years old.

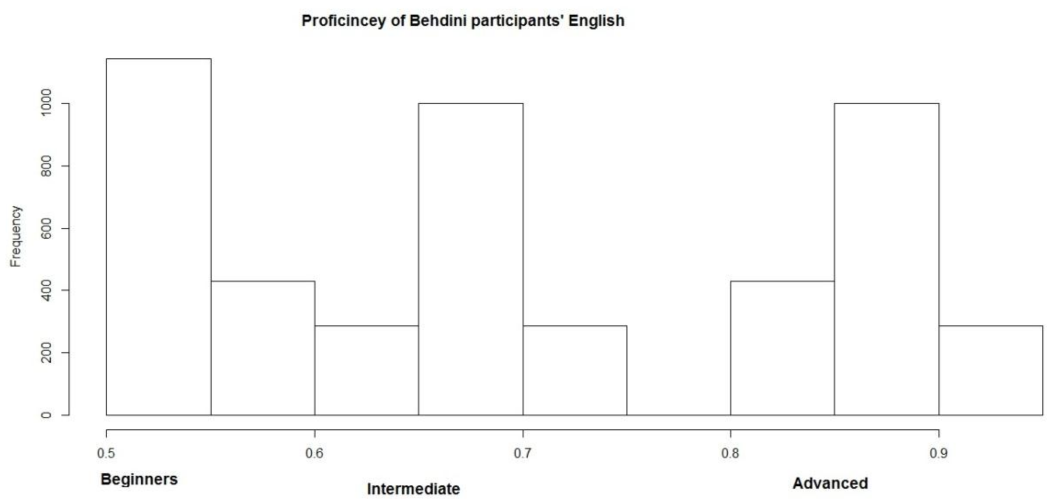

Figure 5-1: The distribution of Behdini participants' English proficiency

5.4 Analysis, Results, and Discussion

Two analyses were carried out, i.e., two types of models were fitted: One on the accuracy and one on the RT. However, the problem with the first analysis is that the data we are dealing with are not of the kind that one could easily say this is an accurate response and that one is an inaccurate response. To overcome this issue, Behdini participants’ results have been compared to the English native speakers’ results. The English ratings are regarded as the target and then we can see how close the Behdini ratings are to the target.

Table 5-1 provides a description for the whole RT dataset, showing all the variables and conditions adopted in the analysis.

Table 5-1: Description of the RT data- dataset

Dataset and R script:		RTdata; RTanalysis-2nd-study.R
Source of dataset:		
Size of dataset:		7160 obs. of 20 variables
Predictors	Factors	Conditions
Random effects	Participant	Anonymized subjects: E1 to E20 for English and B1 to B34 for Behdini
	Item.Number	This shows the randomized numbers for the order in which the sentences are presented in the test from 1 to 144.
	Mother.Sentence	The 4 variants of each sentence are assigned the same mother sentence (gap vs. RP and past vs. non-past). This mother sentence is treated as a random effect so that a separate intercept is fitted for each group of 4 sentence variants.
Fixed effects	Chain.Foot	gap vs. resumptive
	Island	no vs. yes
	Grammatical.Role	subject.A, object.O, oblique, possessive
	Tense	non-past vs. past
	Movement.Type	Short.wh.question, Long.wh.question, Presentative
	Origin.Clause	adjunct, relative, sentential.subject, wh.clause
	Proficiency	The scores that Behdini participants get for their English proficiency test (in %). English participants are assigned 100%.

	Exposure.To.English	This shows the number of years each participant has been exposed to English.
	Other.Languages	This gives the number of other languages that the participants know apart from their first language.
	Age	This shows the age of the participants.
	Handedness	Left-handed vs. Right-handed
	Gender	Female vs. male
	L1	Behdini vs. English
	Clauses	1, 2, 3, 4 (corresponding to the number of clauses in each sentence)
Dependent variables	Rating	D, C, B, A (corresponding to Bad, Marked, Difficult to Process, OK)
	LogSentRT	This measures the RT for the whole sentence.
	LogGapRT	This measures the RT for the segment containing gap or resumptive.
	LogSpillOverRT	This measures the RT for the segment following the GAB.RP segment; i.e. the spillover effect.

5.4.1 Description of Data and a General Overview of the Results

The data used in this section are based on the same distribution of the native speaker experiment in Chapter 4 (see Section 4.3.3.1). In this section an overview of the data description is presented in Tables 5-2 and 5-3 grouped under type followed by examples for each mother sentence. Subsequently, a general overview of the RTs and judgment results is presented to make it easier to follow the statistical analysis of the results. This will include an overview of the ratings based on participants' judgements and reaction times grouped under each condition. The subsets comprise non-islands, relative clauses, and islands.

Table 5-2: Distribution of data based on mother sentences used for each type in non-islands (Each mother sentence is presented once with RP, once with gap, once in past, and once in non-past)

Relative clauses				
Grammatical roles	**No. of mother sentences**	**Movement type**		**No. of mother sentences**
Possessive (as in 128)	4	Short wh-question	Subject (as in 132)	2
Subject (as in 129)	4			
Object (as in 130)	4		Object (as in 133)	2
Oblique (as in 131)	4			

(128) a. This is the man that I see the wife of him.
b. This is the girl that you see the mobile of her.
c. These are the houses that I repair the doors of them.
d. This is the car that you will sell the engine of it.

(129) a. This is the man that he will love your neighbour.
b. This is the girl that she will marry the governor.
c. These are the persons that they will save the kid.
d. This is the doctor that he treats you.

(130) a. This is the car that my brother will sell it.
b. This is the man that I see him.
c. This is the girl that Ali will marry her.
d. These are the houses that I will burn them.

(131) a. This is the man that I talk with him.
b. This is the girl that I walk with her.
c. These are the people that I work against them.
d. This is the lawyer that I work for him.

(132) a. Which student will he meet the dean?
b. Which player he wins more golden medals?

(133) a. Which car does John buy it?
b. Which bike do you want it?

Table 5-3: Distribution of data based on mother sentences used for each type in object islands (Each mother sentence is presented once with RP, once with gap, once in past, and once in non-past)

Origin clause	**No. of mother sentences**	**Movement type**
Adjunct (as in 134.b, c, d)	3	Presentative
Relative (as in 135)	3	
Sentential subject (as in 136.b, c)	2	
Wh-clause (as in 137)	3	Long wh-Q
Adjunct (as in 134.a)	1	
Sentential subject (as in 136.a)	1	

(134) a. This is the defendant$_i$ [$_{CP}$that you will be surprised [$_{CP}$if you learn [$_{CP}$that they will send her$_i$ to jail]]].
b. I will interview the candidate$_i$ [$_{CP}$that most people will be disappointed [$_{CP}$if people vote for him$_i$]].
c. Which student$_i$ will you be furious [$_{CP}$if the principal would expel him$_i$]?
d. This is the movie$_i$ [$_{CP}$that I say [$_{CP}$whenever you see it$_i$] [$_{CP}$you will not be bored]].

(135) a. These are the jewels$_i$ [$_{CP}$that I know [$_{DP}$the man [$_{CP}$who sends them$_i$ to my mother]]].
b. This is the man$_i$ [$_{CP}$that [$_{DP}$the policeman [$_{CP}$who arrests him$_i$]] saves the president's life].
c. It is these shoes$_i$ that [$_{CP}$I know [$_{DP}$the person [$_{CP}$who gives them$_i$ to you]]].

(136) a. That is the girl$_i$ [$_{CP}$that Peter says [$_{CP}$that [$_{CP}$how much Lars loves her$_i$] will determine the final decision]].
b. Who$_i$ do you think [$_{CP}$that [$_{CP}$to nominate him$_i$] would be a disaster]?
c. This is the car$_i$ [$_{CP}$that [$_{DP}$whatever money you would offer for it$_i$] will not be enough].

(137) a. Which$_i$ dog do you know [$_{CP}$who buys it$_i$ illegally]?
b. Which$_i$ building have you seen [$_{CP}$who was targeting it$_i$]?
c. Who$_i$ does Layla see [$_{CP}$what the government gave him$_i$?

5.4.1.1 Non-islands

This subset of data includes non-island presentative relative clauses, long wh-clauses, and short wh-clauses.

Table 5-4: Acceptance rates of L2ers and natives for grammatical roles in non-islands

L2ers	Subject				Object			
Rating	with gap		with RP		with gap		with RP	
A (good)	%71	192	%44	119	%62	294	%50	239
B	%13	35	%26	71	%20	93	%23	110
C	%12	33	%17	46	%11	55	%16	77
D (bad)	%4	12	%13	36	%7	34	%11	50
	Oblique				Possessive			
Rating	with gap		with RP		with gap		with RP	
A (good)	%42	113	%75	204	%22	59	%56	152
B	%30	82	%14	38	%16	45	%24	63
C	%16	44	%8	23	%30	81	%12	34
D (bad)	%12	33	%3	7	%32	87	%8	23
Natives	Subject				Object			
Rating	with gap		with RP		with gap		with RP	
A (good)	%85	136	%4	4	%95	227	%0	0
B	%6	9	%2	2	%2	4	%5	8
C	%2	3	%10	10	%1	3	%7	12
D (bad)	%7	12	%84	84	%2	6	%88	140
	Oblique				Possessive			
Rating	with gap		with RP		with gap		with RP	
A (good)	%83	150	%1	1	%74	104	%0	0
B	%6	10	%5	6	%19	26	%5	3
C	%5	9	%12	14	%3	4	%12	7

D (bad)	%6	11	%82	99	%4	6	%83	50

Table 5-5: Response times of L2ers and natives for grammatical roles in non-islands

L2ers	With gaps			With RPs		
Grammatical roles	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Subject	-0.25325	0.9990	0.09227	0.93708	0.9998	0.08106
Object	0.25325	0.9992	0.09227	-0.93708	0.9995	0.08106
Oblique	0.62350	0.9995	0.10409	-1.58506	0.9993	0.09145
Possessive	1.00518	0.9997	0.10409	-1.94662	0.9993	0.09145
Natives	With gaps			With RPs		
Grammatical roles	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Subject	0.16601	0.9991	0.10954	0.24950	0.9989	0.10473
Object	-0.16601	0.9987	0.10954	-0.24950	0.9987	0.10473
Oblique	-0.08471	0.9989	0.11897	-0.14860	0.9990	0.11116
Possessive	0.29615	0.9993	0.12275	-0.45674	0.9990	0.13210

In non-islands, as shown in Table 5-4, native speakers prefer gaps over resumptives categorically in the four positions of subject (gap with 91% vs. RP with 6%), object (gap with 97% vs. RP with 5%), oblique (gap with 89% vs. RP with 6%), and possessive (gap with 93% vs. RP with 3%).

Native speakers, as shown in Table 5-5, processed RPs faster than gaps in possessives (the mean RT measure for gaps is 0.9993 but for RPs is 0.9990), similarly in objects (the mean RT measure for gaps and for RPs is 0.9987), gaps were processed slightly faster than RPs in oblique arguments (the mean RT measure for gaps is 0.9989 but for RPs is 0.9990), and gaps were processed faster than RPs in subjects (the mean RT measure for gaps is 0.9989 but for RPs is 0.9991)

L2 learners, on the other hand, accepted both gaps and RPs optionally in the three positions of subject (gap with 84% vs. RP with 70%), object (gap with 82% vs. RP with 73%), and oblique (gap with 72% vs. RP with 89%), whereas in possessives they accepted RPs almost categorically more than gaps (gap with 38% vs. RP with 80%).

L2ers processed RPs categorically faster than gaps in possessives (the mean RT measure for gaps is 0.9997 but for RPs is 0.9993) and marginally in oblique arguments (the mean RT measure for gaps is 0.9995 but for RPs is 0.9993). However, they processed gaps categorically faster than RPs in subjects (the mean RT measure for gaps is 0.9990 but for RPs is 0.9998) and marginally in objects (the mean RT measure for gaps is 0.9992 but for RPs is 0.9995).

Table 5-6: Acceptance rates of L2ers and natives for relatives and wh-clauses in non-islands

L2ers	Relatives				Wh-clauses			
Rating	with gap		with RP		with gap		with RP	
A (good)	63%	322	55%	287	68%	129	28%	56
B	19%	98	23%	119	12%	23	27%	53
C	12%	61	13%	70	11%	21	25%	49
D (bad)	5%	27	8%	43	9%	17	21%	41

Natives	Relatives				Wh-clauses			
Rating	with gap		with RP		with gap		with RP	
A (good)	90%	275	2%	4	95%	74	0%	0
B	4%	12	4%	7	1%	1	5%	3
C	1%	4	10%	18	3%	2	7%	4
D (bad)	5%	16	84%	157	1%	1	88%	51

Table 5-7: Response times of L2ers and natives for relatives and wh-clauses in non-islands

L2ers	With gaps			With RPs		
Origin clauses	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Relatives	0.51435	0.9993	0.13814	-0.80898	0.9996	0.09759
Wh-clauses	-0.51435	0.9988	0.13814	0.80898	09998	0.09759
Natives	With gaps			With RPs		

Origin clauses	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Relatives	0.20025	0.9989	0.12851	0.17259	0.9999	0.12764
Wh-clauses	-0.20025	0.9987	0.12851	-0.17259	0.9986	0.12764

Tables 5-6 and 5-7 include non-islands that are only objects after excluding subject, oblique and possessive structures because they do not appear in wh-clauses. Table 5-6 shows that in non-island structures L2ers over-accept RPs in relative clauses (78%) and wh-questions (55%), as opposed to native speakers who accepted gaps significantly more than RPs in both relatives and wh-clauses. 94% of native speakers accepted gaps in relatives and 96% in wh-clauses. On the other hand, only 6% of natives accepted RPs in relatives and only 5% accepted RPs in wh-clauses.

Table 5-7 shows that native speakers processed wh-clauses faster than relative clauses. They processed RPs slightly faster than gaps in wh-clauses (the mean RT measure for gaps is 0.9987 but for RPs is 0.9986), whereas they processed gaps slightly faster than RPs (the mean RT measure for gaps is 0.9989 but for RPs is 0. 0.9999). Behdini L2 learners of English, on the other hand, processed RPs significantly faster than gaps in both origin clauses. In wh-clauses the difference of processing speed between gaps and RPs is larger than in relatives: in wh-clauses the RT measure for gaps is 0.9988 but for RPs is 09998, and for relatives the RT measure for gaps is 0.9993 but for RPs is 0.9996.

5.4.1.2 Relative clauses

Relative clauses include only object chains to compare the acceptance and processing of resumptives and gaps in island and non-island configurations. Possessives, obliques, and subjects have been removed from this subset of data to avoid any confusions because they do not appear in islands.

Table 5-8: Acceptance rates of L2ers and natives for islands and non-islands in relative clauses

L2ers	Non-islands				Islands			
Rating	with gap		with RP		with gap		with RP	
A (good)	57%	155	66%	180	24%	49	45%	61
B	25%	68	21%	55	23%	47	17%	23
C	12%	33	10%	28	29%	59	18%	25
D (bad)	6%	16	3%	9	24%	49	20%	27

Natives	Non-islands				Islands			
Rating	with gap		with RP		with gap		with RP	
A (good)	95%	152	%	0	5%	4	8%	5
B	2%	3	5%	5	12%	10	27%	16
C	1%	1	8%	8	5%	4	8%	5
D (bad)	2%	4	87%	87	78%	62	57%	34

Table 5-9: Response times of L2ers and natives for islands and non-islands in relative clauses

L2ers	With gaps			With RPs		
Relative clauses	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Islands	-0.02789	0.9994	0.08689	1.18309	0.9998	0.09751
Non-islands	0.02789	0.9994	0.08689	-1.18309	0.9995	0.09751
Natives	With gaps			With RPs		
Relative clauses	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Islands	0.40940	0.9993	0.13500	0.01471	0.9994	0.11837
Non-islands	-0.40940	0.9989	0.13500	-0.01471	0.9990	0.11837

Table 5-8 shows the results of the relative clauses subset of data. Native speakers parametrically prefer gaps over resumptives in non-islands, whereas in islands the rate of acceptance of resumptives increases. This goes in line with the diagnostics of intrusive pronouns. As for L2ers, they accepted more resumptives (87%) than gaps (79%) in non-islands and more resumptives (62%) than gaps (47%) in islands. Therefore, it is clear that Behdini learners highly prefer RPs in non-island relative clauses. This reveals they are less sensitive to the interaction of islands and RPs.

Native speakers, as shown in Table 5-9, processed gaps slightly faster than RPs in both islands (the mean RT measure for gaps is 0.9993 and for RPs is 0.9994) and non-islands (the mean RT measure for gaps is 0.9989 and for RPs is 0.9990). As for L2ers, as shown in Table 5-9, they processed gaps faster than RPs in islands (the mean RT measure for gaps is 0.9994 but for RPs is 0.9998) but RPs slightly faster than gaps in non-islands (the mean RT measure for gaps is 0.9994 but for RPs is 0.9995).

5.4.1.3 Islands

The islands subset of data contains only object chains that are in island configurations divided into presentative relative clauses and long wh-questions based on the movement type factor to compare the acceptance and processing of the four types of islands based on the origin clause factor.

Table 5-10: Acceptance rates of L2ers and natives for long wh-questions and presentative relative clauses in islands

L2ers	Long wh-questions				Presentative Relative Clauses			
Rating	with gap		with RP		with gap		with RP	
A (good)	%24	83	%29	110	%30	165	%54	253
B	%28	95	%23	87	%23	125	%21	101
C	%19	65	%24	88	%26	141	%12	59
D (bad)	%29	96	%24	89	%21	113	%13	63

Natives	Long wh-questions				Presentative Relative Clauses			
Rating	with gap		with RP		with gap		with RP	
A (good)	%19	37	%4	8	%60	144	%15	35
B	%14	28	%21	38	%8	18	%46	111

C	%7	15	%15	28	%25	61	%8	19
D (bad)	%60	120	%60	106	%7	17	%31	75

Table 5-11: Response times of L2ers and natives for long wh-questions and presentative relative clauses in islands

L2ers	With gaps			With RPs		
Movement type	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Long wh-questions	-0.28517	0.9992	0.06309	0.18781	0.9998	0.06044
Presentative	0.28517	0.9994	0.06309	-0.18781	0.9998	0.06044
Natives	With gaps			With RPs		
Movement type	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Long wh-questions	-0.28431	0.9994	0.07732	-0.01809	0.9995	0.07258
Presentative	0.28431	0.9995	0.07732	0.01809	0.9996	0.07258

In islands, as previewed in Table 5-10, the acceptability of RPs is enhanced showing that there is a strong interaction between islandhood and resumption. RPs are accepted in presentative relative clauses (with 61%) more than in long wh-questions (25%). On the other hand, L2 learners accepted more RPs than native speakers in both movement types: in long wh-questions gaps and RPs are equally accepted (gap with 52% vs. RP with 52%) and in presentative relative clauses RPs are accepted more than in wh-questions (with 61%).

Native speakers, as shown in Table 5-11, processed long wh-questions faster than presentative relative clauses. They processed gaps slightly faster than RPs in both movement types. In long wh-questions the mean RT measure for gaps is 0.9994 but for RPs is 0.9995. As for presentative relative clauses, the mean RT measure for gaps is 0.9995 but for RPs is 0.9996.

Behdini L2 learners of English, on the other hand, processed RPs significantly faster than gaps in both movement types. RPs are processed equally by Behdini speakers in long wh-questions and presentative relative clauses and the mean

RT measure is 0.9998 for both. The RT measure for gaps in long wh-questions is 0.9992 and for presentative relative clauses is 0.9994.

Table 5-12: Acceptance rates of L2ers and natives for island types in islands

L2ers	Adjunct				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	%34	92	%51	155	%24	49	%45	61
B	%24	65	%25	75	%23	47	%17	23
C	%24	65	%15	46	%29	59	%18	25
D (bad)	%18	50	%9	30	%24	49	%20	27
	sentential.subject				wh.clause			
Rating	with gap		with RP		with gap		with RP	
A (good)	%30	62	%47	96	%22	45	%25	51
B	%30	62	%28	56	%23	46	%17	34
C	%24	50	%12	25	%16	32	%25	51
D (bad)	%16	30	%13	27	%39	80	%33	68
Natives	Adjunct				Relative			
Rating	with gap		with RP		with gap		with RP	
A (good)	%5	6	%8	10	%5	4	%8	5
B	%26	31	%47	56	%12	10	%27	16
C	%12	15	%11	13	%5	4	%8	5
D (bad)	%57	68	%34	41	%78	62	%57	34
	sentential.subject				wh.clause			
Rating	with gap		with RP		with gap		with RP	
A (good)	%12	14	%21	25	%25	30	%2	3
B	%32	38	%52	62	%8	10	%13	15
C	%6	8	%5	7	%5	6	%18	22
D (bad)	%50	60	%22	26	%62	74	%67	80

Table 5-13: Response times of L2ers and natives for island types in islands

L2ers	With gaps			With RPs		
Origin clause	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Adjunct	0.06847	0.9995	0.09229	-0.08394	0.9989	0.09183
Relative	-0.06847	0.9994	0.09229	0.08394	0.9989	0.09183
Sentential subject	-0.16466	0.9993	0.09229	0.12716	0.9989	0.08274
Wh-clause	-0.45192	0.9991	0.09234	0.40754	0.9989	0.08280
Natives	With gaps			With RPs		
Origin clause	Estimate	Mean RT (msec)	Std. Error	Estimate	Mean RT (msec)	Std. Error
Adjunct	-0.09508	0.9994	0.14492	0.09283	0.9995	0.11721
Relative	0.09508	0.9995	0.14492	-0.09283	0.9995	0.11721
Sentential subject	0.22909	0.9995	0.11806	-0.11859	0.9996	0.10088
Wh-clause	-0.17062	0.9993	0.13278	-0.13382	0.9993	0.10088

As shown in Table 5-12, in general L2ers, compared to native speakers, accepted more RPs than they should and more gaps than they should in all of the four island types. Native speakers accepted RPs the most in sentential subjects (gap with 44% vs. RP with 73%), followed by adjuncts (gap with 31% vs. RP with 55%), followed by relatives (gap with 17% vs. RP with 35%), and finally wh-clauses (gap with 33% vs. RP with 15%). Only in wh-clauses gaps are preferred over RPs. As for Behdini speakers, RPs are accepted the most in adjuncts (gap with 58% vs. RP with 76%), followed by sentential subject (gap with 60% vs. RP with 75%), followed by relatives (gap with 47% vs. RP with 62%), and finally wh-clause (gap with 45% vs. RP with 42%).

Table 5-13 shows that native speakers processed gaps equally to RPs in relatives (the mean RT measure for gaps is 0.9995 and for RPs is 0.9995) and in wh-clauses (the mean RT measure for gaps is 0.9993 and for RPs is 0.9993), whereas in adjunct (the mean RT measure for gaps is 0.9994 but for RPs is 0.9995) and sentential subject islands (the mean RT measure for gaps is 0.9995 but for RPs is 0.9996) gaps are processed very slightly faster than RPs.

L2ers, on the other hand, processed gaps significantly faster than RPs. The mean RT measure for RPs in adjuncts is 0.9989 but for gaps is 0.9995. The mean RT measure for RPs in relatives is 0.9989 but for gaps is 0.9994. In sentential subject islands the mean RT measure for RPs is 0.9989 but for gaps is 0.9993. Finally, in wh-clauses the mean RT measure for RPs is 0.9989 but for gaps is 0.9991.

5.4.2 Statistical Analysis of Accuracy and RT

The general overview of the results in the previous section shows that the acceptance results for native speakers of English are in line with those found in the first experiment.

For the requirement of investigating the research questions, four subsets of data were extracted from the RT dataset, and separate analyses have been carried out for each subset of the data as follows:

ANALYSIS 1: (Possessives) including only possessives or NP-internals. And possessives have been excluded from the rest of subsets below.

ANALYSIS 2: (Non-islands) including relative clauses and short wh.questions, excluding oblique (as none of the oblique arguments appears in a short wh-question) and possessive arguments.

ANALYSIS 3: (Relative clauses) including only object chains. The data also contain island vs. non-island relative clauses.

ANALYSIS 4: (Islands) including only object chains that are islands based on the island types.

It is worth to mention that, as in the native-speaker study, "mother sentence" is used as a random effect instead of "item number" as items come in groups of four sentences which are variants of the same mother sentence with only differences in terms of chain foot (gap vs. RP) and tense (non-past vs. past).

It is to be noted, as referred to in Chapter 4, that the 4-point scale is transformed into a continuous measure (i.e. log odds) by the link function of GLMER. The reference level remains the highest rating. The link function transforms the expected values of the response variable into log odds, i.e. a continuous variable.

5.4.2.1 The subset of data including only possessive structures in the accuracy analysis

This subset of data includes only possessive clauses and has been created in order to investigate the variability in the possessive structures, which behave completely differently between L1 and L2. Thus, a model is fitted to those structures only.

The best mixed-effects model for the dataset is described by the following formula:

Rating ~ Chain.Foot * L1 + (1|Participant) + (1|Mother.Sentence)

The formula indicates that acceptability varies according to an interaction of chain foot and L1. These two elements are the fixed effects part of the modeling. As for participant and mother sentence, they are taken into account as random effects.

Table 5-14 shows that the mother sentence and participant have an effect on the variability of the data. The standard deviation is estimated at 1.0587 for participant and at 0.2022 for mother sentence. This means that participant accounts for more variability in the possessives subset of data, but it does not converge with the random slopes for the chain foot.

Table 5-14: Coefficients for the random effects for the possessives subset in the accuracy analysis

Random effects:			
Groups	Name	Variance	Std.Dev.

Participant	(Intercept)	1.12083	1.0587
Mother.Sentence	(Intercept)	0.04088	0.2022

Table 5-15 is an ANOVA comparison of mixed models which shows how the fit of the model has improved incrementally. As shown in Table 5-16, Chain.Foot and L1 in interaction are the most important elements with the biggest reduction in AIC measured as 192.99. Additionally, the p-value is well-supported with a low and significant value (p < 0.00000000000000022). This is followed by chain foot with the second highest reduction in AIC, which is 4.93. Finally, this is followed by chain foot and L1 as main effects with 3.84 as reduction in AIC. Tense and proficiency were also added as main effects, but they ended up being insignificant. Tense increased the AIC with -0.92 and proficiency increased the AIC with -1.27.

Table 5-15: Model comparison statistics for the subset of possessives in the accuracy analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	740	964.80	1	956.80	0.008444 **	4.93
Chain.Foot + L1	739	960.96	2	950.96	0.01566 *	3.84
Chain.Foot * L1	738	767.97	2	755.97	< 2.2e-16 ***	192.99
Chain.Foot * L1 + Tense	737	768.89	3	756.89	0.24337	-0.92
Chain.Foot * L1 + Proficiency	737	769.24	3	755.24	0.3906	-1.27

Table 5-16 previews the appropriate parameters or coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for Chain.Foot is resumptive and for L1 is Behdini. As for Rating, it is A corresponding to full acceptability.

Table 5-16 shows that native speakers were significantly more likely than the L2 speakers to accept possessive structures without RP (Z value = 0.011, p<0.001). As for L2 learners, possessive structures with a gap were accepted more than those with an RP (Z value = 8.758, p<0.001).

The estimate value of Chain.Footgap is 1.9037 and the effect size is (Z value = -1.229, p<0.001), and this means that when chain foot is a gap in possessive structures, the acceptability rate is lower for Behdini learners. The estimate value of L1English is 19.4592 and the effect size is (Z value = 0.011, p<0.001), denoting that when L1 corresponds to English in possessive structures, the acceptability rate tends to highly decrease when there is a gap. As for Chain.Footgap:L1English, the estimate is -22.2815 and the effect size is (Z value = -0.012, p<0.001), and this means that when chain foot is gap and L1 is English in possessive structures, the acceptability rate tends to be very high. However, when L1 is Behdini in possessive structures, RPs are highly accepted as expected.

Table 5-16: Coefficients for a mixed-effect model for the subset of possessives in the accuracy analysis (Reference levels: Chain.Foot: resumptive, L1: Behdini)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-0.3051	0.2482	-1.229	0.219
Chain.Footgap	1.9037	0.2174	8.758	<2e-16 ***
L1English	19.4592	1838.2773	0.011	0.992
Chain.Footgap:L1English	-22.2815	1838.2773	-0.012	0.099 *

Figure 5-2 illustrates the best model in the possessives subset of data showing the interaction of chain foot (whether there is a resumptive or gap) and L1 (whether participants' L1 is English or Behdini).

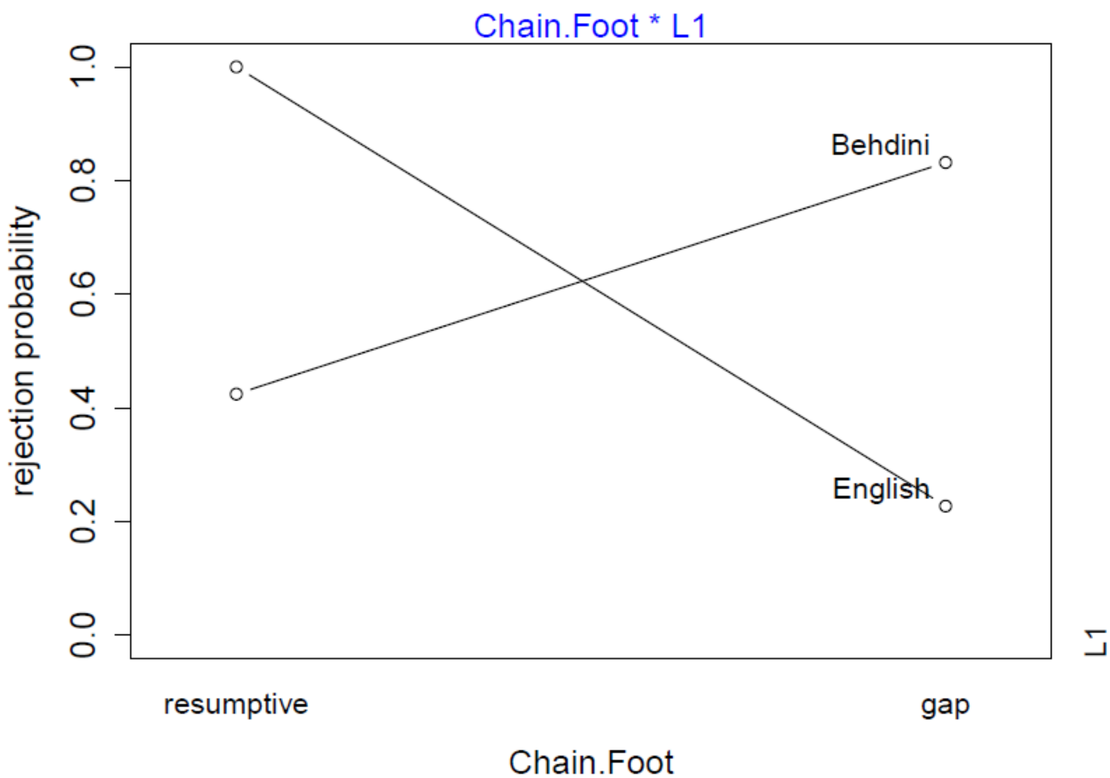

Figure 5-2: Visualization of the best model in the subset of possessives in the accuracy analysis

Figure 5-2 addresses the items corresponding to possessive structures with RPs (as in 138a) and with gaps (138b).

(138) a. This is the man$_i$ that I see the wife of him$_i$.

b. This is the man$_i$ that I see the wife of __$_i$.

The figure demonstrates that when L1 is English, gaps are accepted categorically and resumptives are rejected. On the other hand, as expected, when L1 corresponds to Behdini resumptives are preferred over gaps. This shows that Behdini learners have transferred the use of RPs in possessives from their L1 into English.

5.4.2.2 The subset of data including only possessive structures in the RT analysis

This subset of data includes only possessive structures to measure Behdini learners’ and English native speakers' reaction time spent on judging the resumptives and gaps in possessive clauses. The RT independent variable is log-transformed and the data are log-transformed for the ease of interpretability and tradition, as in cognitive psychology log transforms of reaction time are often used. It was also checked for normality of distribution.

The best mixed-effects model for the possessives dataset in the RT measurement analysis is described by the following formula:

LogGapRT ~ Chain.Foot * L1 * as.numeric(Rating) + (1|Participant)

The formula points out that the dependent variable in the modeling is LogGapRT, which refers to the RT rate of the sentence segment containing either a gap or a resumptive which forms a critical part in the analysis. Chain foot, L1, and rating (treated numerically) interacting together are the fixed effects part of the formula. (1|Participant) is treated as a random effect.

Table 5-17 shows that the participant has an effect on the variability of the data, but mother sentence increased the AIC. The standard deviation is measured as 0.3906 for participant. This means that participant accounts for a range of variability in the possessives subset of data, but it does not converge with the random slopes for the chain foot. It is worth to mention that age has been added as a random effect, but it did not have any effects on participants' speed of judgements as it increased the AIC with -2.58. The mother sentence increased the AIC with -0.9.

Table 5-17: Coefficients for the random effects for the possessives subset in the RT analysis

Random effects:			
Groups	Name	Variance	Std.Dev.
Participant	(Intercept)	0.1525	0.3906
Residual	(Intercept)	0.4145	0.6438

Table 5-18 is an ANOVA summary for the model which shows how the fit of the model in the subset of possessives has been built incrementally in the RT analysis. All of the three coefficients that are converged in the model are statistically significant. The table shows that chain foot as a main effect scored the highest reduction in AIC with 90.7, and this is followed by chain foot and L1 as main effects with 21.9. This is followed by the three-way interaction of chain foot, L1, and rating with 13.4 as reduction in AIC. This is followed by chain foot and L1 in interaction with 12.2 as reduction in AIC. Rating, as a main effect, was not significant; it hardly reduced the AIC with only 1.2. Tense resulted in increasing the AIC with -1, and proficiency also increased the AIC with -2.

Table 5-18: Model comparison statistics for the subset of possessives in the RT analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	1618.554	1619.0	1	1611.0	< 2.2e-16 ***	90.7
Chain.Foot + as.numeric(Rating)	1688.185	1704	2	1590	0.1086	-69.6
Chain.Foot + L1	1597.442	1597.1	2	1587.1	1.014e-06 ***	21.9
Chain.Foot * L1	1585.796	1584.9	2	1572.9	0.0001692 ***	12.2
(Chain.Foot * L1) + Tense	1588.973	1585.9	3	1571.9	0.3058	-1
(Chain.Foot * L1) +	1585.227	1586.9	3	1572.9	0.8807	-2

Proficiency						
Chain.Foot * L1 + as.numeric(Rating)	1588.558	1583.7	3	1565.7	0.06432	1.2
Chain.Foot * L1 * as.numeric(Rating)	1568.848	1571.5	3	1537.5	0.0002108 ***	13.4

Table 5-19 lists the parameters or coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for Chain.Foot is resumptive and for L1 is Behdini.

Table 5-19: Coefficients for a mixed-effect model for the subset of possessives in the RT analysis (Reference levels: Chain.Foot: resumptive, L1: Behdini, Rating: A)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	7.30743	0.08615	84.82
Chain.Footgap	0.47795	0.10847	4.41
L1English	-1.00639	0.37042	-2.72
as.numeric(Rating)B	-0.02626	0.10186	-0.26
as.numeric(Rating)C	0.04536	0.13198	0.34
as.numeric(Rating)D	0.20565	0.15241	1.35
Chain.Footgap:L1English	0.23537	0.33485	0.70
Chain.Footgap: as.numeric(Rating)B	0.07295	0.17740	0.41
Chain.Footgap: as.numeric(Rating)C	0.12921	0.17523	0.74
Chain.Footgap: as.numeric(Rating)D	0.08027	0.19205	0.42
L1English: as.numeric(Rating)B	1.82220	0.52752	3.45
L1English: as.numeric(Rating)C	1.06599	0.46741	2.28
L1English: as.numeric(Rating)D	0.30311	0.31329	0.97
Chain.Footgap:L1English: as.numeric(Rating)B	-1.38540	0.54793	-2.53
Chain.Footgap:L1English:			

as.numeric(Rating)C	-1.55852	0.57892	-2.69

Figures 5-3 and 5-4 illustrate the best model in the possessives subset of data showing the interactions of chain foot with L1 and of chain foot, L1, and rating.

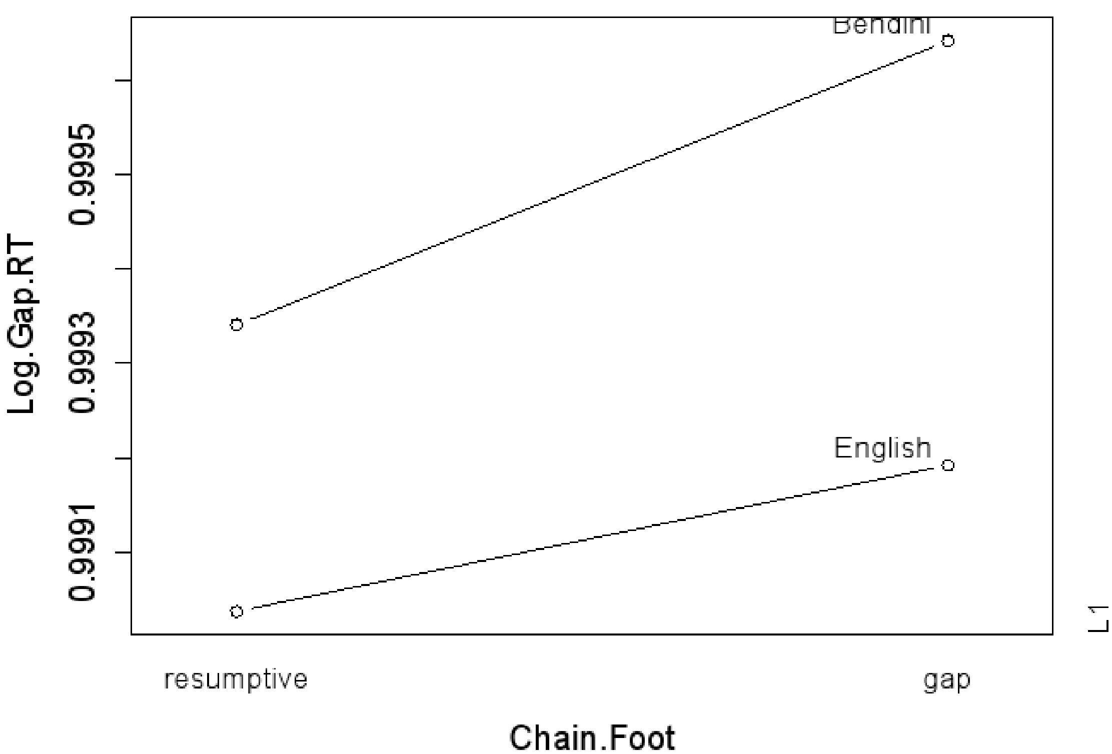

Figure 5-3: Reading speed of RPs and gaps in the subset of possessives in the RT analysis

Figure 5-3 shows the effects of whether there is a gap or a resumptive and whether participants' native language is Behdini or English as per their speed of reaction regarding the possessive structures. The figure shows that native speakers made judgements on possessive structures faster than Behdini speakers. The judgement on gaps took the Behdini learners longer to process than resumptives, which was expected because in Behdini possessives never take gaps. This is indicated by the estimate value of Chain.Footgap, which is 0.47795 and the effect size is (t value = 4.41, $p<0.001$) (whereas for Chain.Footresumptive it is -0.61213 and the effect size is (t value = -10.90, $p<0.001$ - this was run in a different model with gap as reference level for Chain.foot.) Table 5-19 shows that resumptives in possessive clauses took the Behdini participants a shorter time to process.

RPs in possessive structures were processed more slowly by the native English speakers, as the estimate value of L1English is -1.00639, meaning that the judgements of English native speakers on gaps in possessive structures were made marginally faster, and the effect size is (t value = -2.72, $p<0.001$).

As for the interaction of chain foot and L1, the estimate value of the Chain.Footgap:L1English is 0.23537 and the effect size is (t value = 0.70, $p<0.001$). This shows that gaps in possessive structures slow down English speakers' processing, but RPs speed up their processing.

Therefore, Behdini speakers accept RPs in possessives more than gaps (as shown in Figure 5-2) and they process them faster than gaps. Native speakers, on the other hand, accept gaps and reject RPs in possessives categorically (Figure 5-2), but they process RPs faster than gaps.

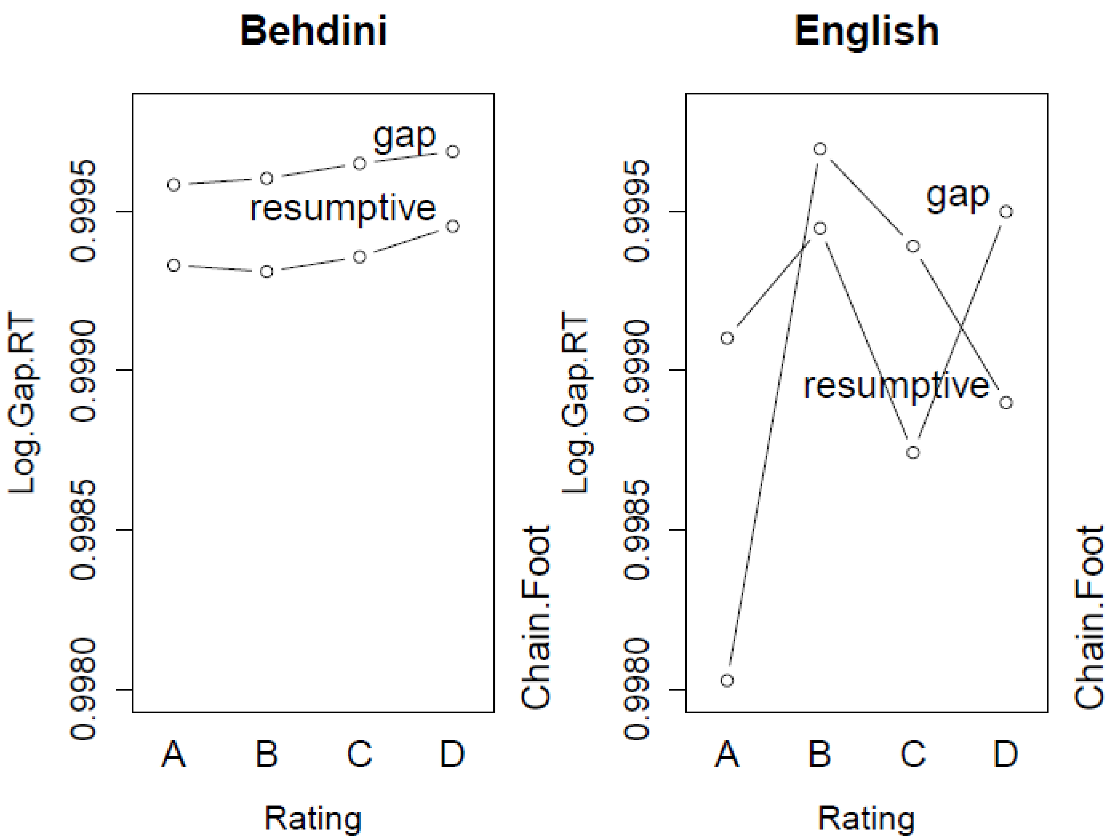

Figure 5-4: Effect of rating on the reading speed of RPs and gaps in the subset of possessives in the RT analysis

Figure 5-4 shows the effect of rating on the reaction time of L2ers and native speakers in their processing of RPs and gaps.

Native speakers processed grammatical sentences (rating A) significantly faster than ungrammatical sentences (rating D). The estimate value of L1English:as.numeric(Rating)D is 0.30311 and the effect size is (t value = 0.97, p<0.001), meaning that ungrammatical sentences were processed more slowly than grammatical sentences by native speakers. As for Behdini speakers, they also processed grammatical sentences faster than ungrammatical sentences; however, the difference is not as robust as with native speakers.

5.4.2.3 The subset of data including non-island structures in the accuracy analysis

This subset of data includes non-island relative clauses in presentative structures and wh-clauses. Oblique and possessive arguments are excluded because none of them appear in short wh-questions.

The best model for the subset of non-island structures is represented by using the following model specification formula:

Rating ~ Chain.Foot * L1 * Origin.Clause + Proficiency * Chain.Foot + (1|Mother.Sentence) + (1|Participant)

The formula points out that acceptability patterns vary according to the three-way interaction of chain foot (gap vs. RP), origin clause (wh-clause vs. relative), and L1 (Behdini vs. English), plus the interaction of proficiency and chain foot. The formula presents the most important elements in the analysis through these four factors, which represent the fixed effects. As for the last two elements of (1|MotherSentence) and (1|Participant), they are taken into account as random effects.

Table 5-20 shows the coefficients for the random effects part of the modeling in the non-islands subset of the data. The table shows that the participant effect allows for more data to vary with the standard deviation measured as 0.9656. This is followed by the mother sentence effect with 0.3448 as standard deviation. It is to be noted that there was no convergence of participant variation with the reduced intercepts. However, the participant variation did not converge with the random slope of chain foot.

Table 5-20: Coefficients for the random effects for the subset of non-island structures in the accuracy analysis

Random effects:			
Groups	Name	Variance	Std.Dev.
Participant	(Intercept)	0.9323	0.9656
Mother.Sentence	(Intercept)	0.1189	0.3448

Figure 5-5 shows Behdini and English speakers' individual variation which measures the random effect for participant to see which group of speakers shows more individual variation.

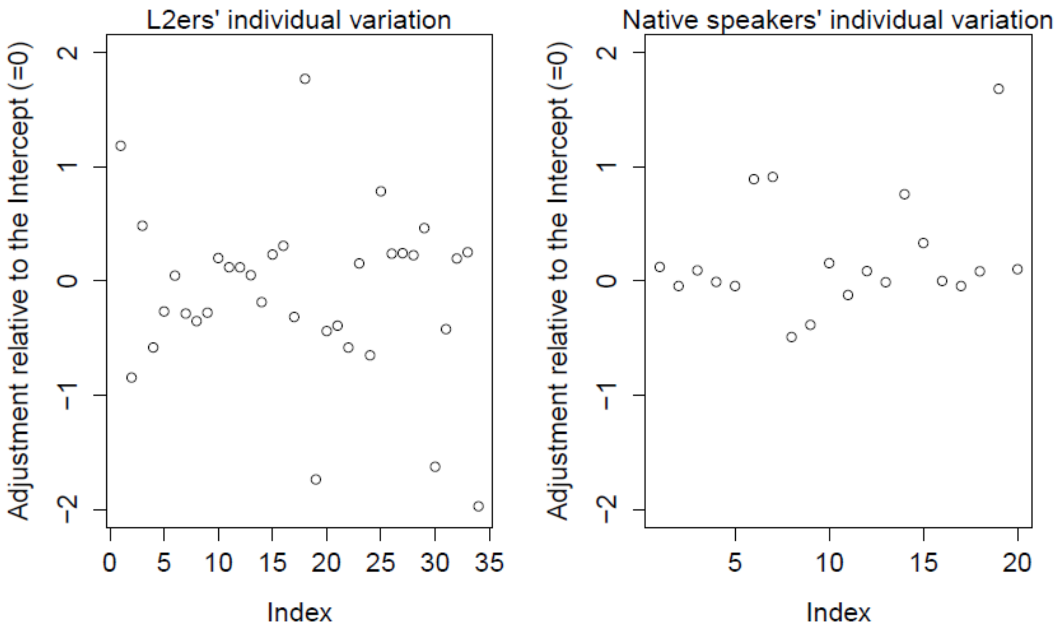

Figure 5-5: Individual variation of native speakers and L2ers for the random effect of participant in non-islands

Figure 5-5 shows the limited amount of individual variation in the native English speakers' judgements, compared with that of the L2ers' judgements. It can be observed that only some L2ers have a substantial negative adjustment of the intercept (i.e. this is a clear difference compared with native speakers). That is, only some L2ers scored a higher acceptance rate.

Individual differences were tested to see if they are correlated with proficiency by extracting the intercept adjustments for participants and running a correlation test between these and the proficiency scores. However, it was shown that the individual differences do not correlate with proficiency.

Table 5-21 lists the reduction of AIC in an ANOVA comparison for the significant factors that were added to build the optimal model in the non-islands subset of data. The table shows that chain foot and L1 in interaction represent the most important factors in the modeling as they scored the highest reduction in AIC, which is 341.2 and the p value is significant ($p < 0.001$). The second highest reduction in AIC is scored by chain foot as a main effect, which is 333. This is followed by the three-way interaction of chain foot, L1, and origin clause with 34 as reduction in AIC. This is followed by the formula, Chain.Foot * L1 * Origin.Clause + Proficiency * Chain.Foot, with 8.9 as reduction in AIC. The main effects of chain foot and L1 was not significant and the AIC was hardly improved with only 0.4. the formula, Chain.Foot * L1 + Origin.Clause, was also not significant with a slight reduction in AIC with 1.2. Tense, as a main effect, was not significant and it resulted in a very light reduction in AIC with only 0.1. Proficiency, as a main effect, was not significant and it resulted in increasing the AIC with -0.8, but it was significant in interaction with chain foot as mentioned above.

Table 5-21: Model comparison statistics for the subset of non-islands in the accuracy analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	2041	2392.2	1	2384.2	< 2.2e-16 ***	333
Chain.Foot + L1	2040	2391.8	2	2381.8	0.1172	0.4
Chain.Foot * L1	2039	2051.0	2	2039.0	< 2.2e-16 ***	341.2
Chain.Foot * L1 + Origin.Clause	2038	2049.8	3	2035.8	0.07434	1.2
Chain.Foot * L1 * Origin.Clause	2035	2017	3	1997	1.642e-08 ***	34
Chain.Foot * L1 * Origin.Clause + Tense	2034	2016.9	4	1994.9	0.1534	0.1
Chain.Foot * L1 * Origin.Clause + Proficiency	2035	2017.8	4	1995.8	0.2747	-0.8
Chain.Foot * L1 * Origin.Clause + Proficiency * Chain.Foot	2033	2008.1	4	1994.1	0.0007 **	8.9

To recall the levels of each factor in the model, see Table 5-1 above. The model yields the estimates for the coefficients shown in Table 5-22, which lists the coefficients for the fixed-effect predictors. The intercept represents the group mean for Rating=A (denoting full grammatical), Chain.Foot=resumptive, L1=Behdini, and Origin.Clause=wh-clause. That is to say, this table is calibrated for the reference level of each factor represented by A for rating, resumptive for chain foot, Behdini for L1, and wh-clause for origin clause.

Table 5-22: Coefficients of a generalised linear mixed model fitted to the acceptability data for non-islands (Reference levels: Chain.Foot: resumptive, L1: Behdini, Origin.Clause: wh-clause)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	2.4139	0.9858	2.449	0.0143 *
Chain.Footgap	-2.7141	0.6399	-4.242	2.22e-05 ***
L1English	17.8044	366.0314	0.049	0.9612
Origin.Clauserelative	-1.3260	0.3054	-4.342	1.41e-05 ***
Proficiency	-1.8960	1.3209	-1.435	0.1512
Chain.Footgap:L1English	-19.9107	366.0888	-0.054	0.9566
Chain.Footgap:Origin.Clauserelative	1.5601	0.2778	5.616	1.96e-08 ***
L1English:Origin.Clauserelative	-12.5580	366.0072	-0.034	0.9726
Chain.Footgap:Proficiency	1.0744	0.8355	1.286	0.0084 **
Chain.Footgap:L1English:Origin.Clauserelative	12.8311	366.0535	0.035	0.9720

Figures 5-6 and 5-7 plot the interactions involved in the optimal model for the non-island structures subset of the data. In particular, they show these interactions: Chain foot, origin clause, and L1 (Figure 5-6) and chain foot and proficiency (Figure 5-7).

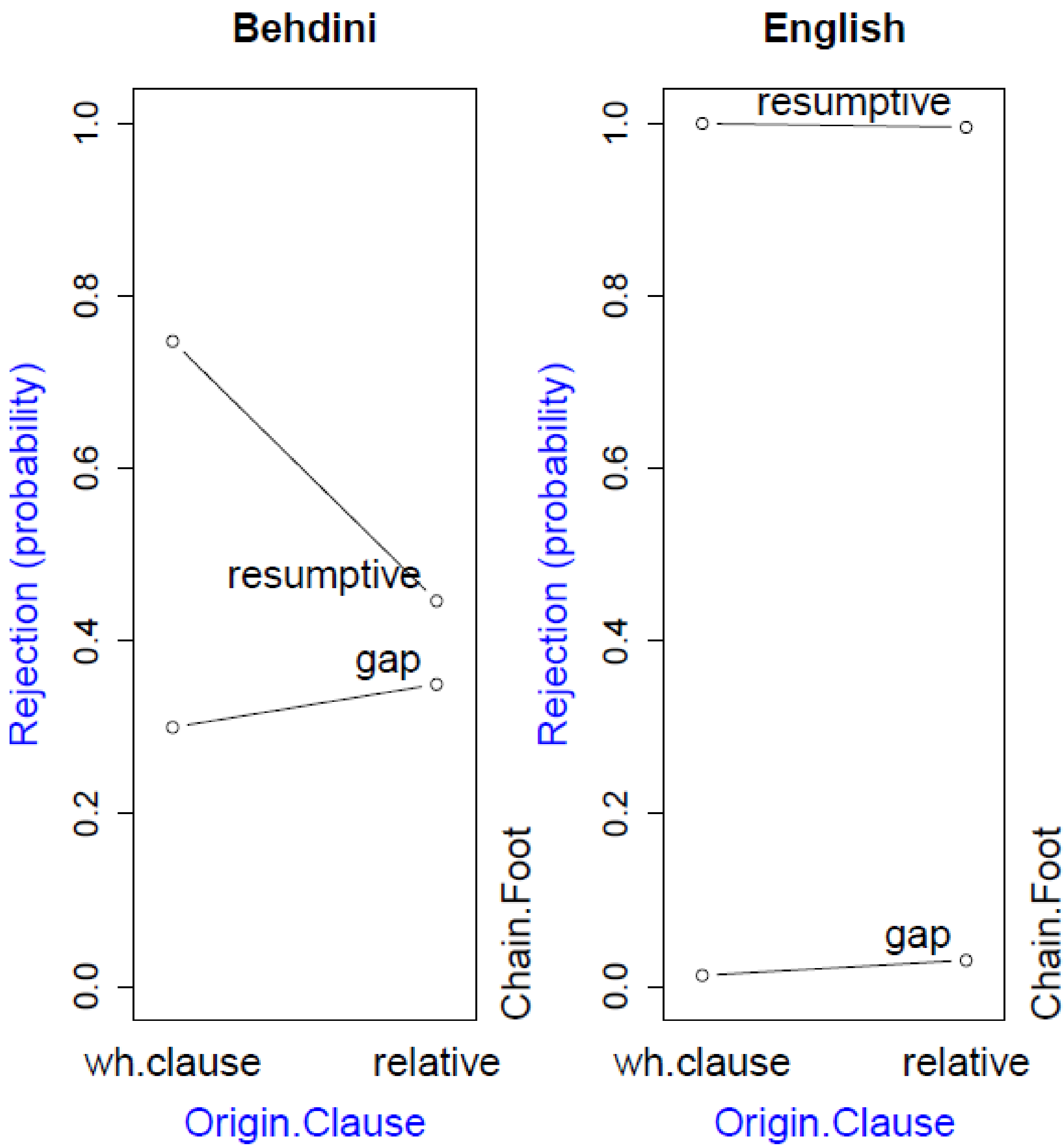

Figure 5-6: Rejection probability of the effect of chain foot, origin clause, and L1 in non-island structures in the accuracy analysis

Figure 5-6 shows the interaction between whether there is a gap or resumptive in non-islands and whether the non-island clause is a relative clause (as in 139) or a wh-clause (as in 140) and whether participants' L1 corresponds to Behdini or to English.

(139) a. This is the car$_i$ that my brother will sell __$_i$.

b. This is the car$_i$ that my brother will sell **it**$_i$.

(140) a. Which car$_i$ does John buy __$_i$?

b. Which car$_i$ does John buy **it**$_i$?

The figure shows that the acceptance patterns are similar in both groups in both origin clause types (that is, in relative clauses and in wh-clauses), with respect to preferring gaps over RPs. However, native speakers accepted more gaps than L2ers in both origin clause types.

Behdini speakers accepted resumptive pronouns as well. They accepted RPs much more than native speakers of English and the difference is especially significant in relative clauses.

Regarding the native speakers of English, the figure shows that participants rate gaps as acceptable in both origin clause types and they very highly preferred them over resumptives. As for RPs, native speakers rejected them categorically and quite similarly in relative clauses and wh-clauses.

L2 learners significantly accepted gaps in wh-clauses (Z value = -4.242, $p < 0.001$). They also significantly rejected gaps in relative clauses with a less effect size than in wh-clauses, and this is indicated by (Z value = 5.616 $p < 0.001$). However, as shown in Figure 5-6, the effect size of accepting gaps is stronger in native speakers' judgements.

The effect size of Origin.Clauserelative is (Z value = -4.342, $p < 0.001$), and this indicates that Behdini speakers tend to accept relative clauses with RPs more than relative clauses with gaps.

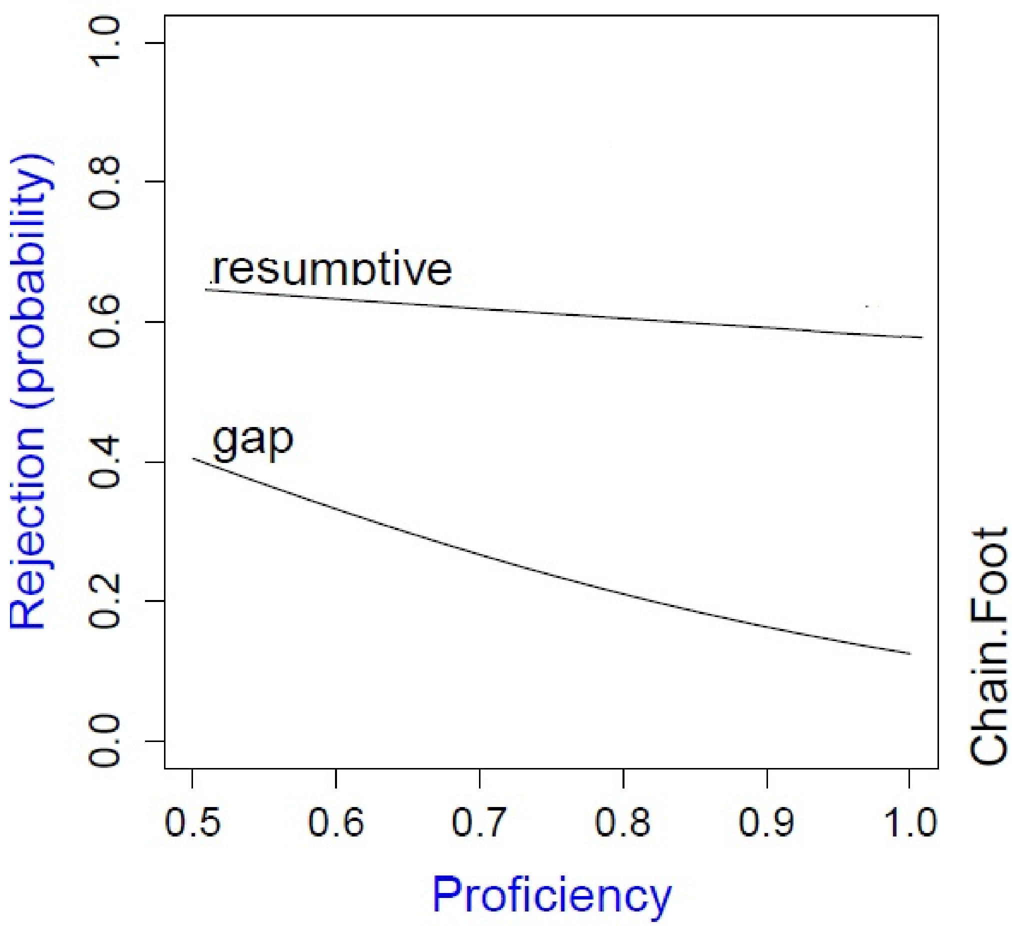

Figure 5-7: Effect of chain foot and proficiency in non-island structures in the accuracy analysis with Behdini participants only

Figure 5-7 shows the effect of Behdini learners' proficiency of the English language on the acceptance of gaps and RPs in non-island structures.

It is to be noted that for the proficiency analysis in non-islands, a separate model has been refitted for Behdini participants (see the summary table in Appendix 8). The figure indicates that with the increase of Behdini speakers' proficiency level, the rate of acceptance of gaps highly increases. However, the rate of resumptives is not affected with the increase of proficiency. These observations are based on the model fit of non-native speakers (see Appendix 8), in which the effect size for Chain.Footgap:Proficiency is (Z value = -8.300 $p < 0.001$). And this indicates that the rate of acceptability of gaps highly and significantly increases with the increase of the proficiency rate of Behdini participants.

This proves that highly proficient Behdini learners show a more native-like performance in that they accepted more gaps. Still, they were not sensitive to RP rejection in non-islands.

In conclusion, based on Table 5-22 and Figures 5-5, 5-6, and 5-7, we can conclude the following:

- L2ers show more individual variation in their judgements than native speakers (see Figure 5-5).

- There is a marked difference between wh-questions and relative clauses in the grammar of the L2ers, in that RPs tend to be rejected much more in the former.

- Non-native speakers do not reject resumptives in relative clauses significantly more than gaps.

- Proficiency of Behdini learners' English language has a significant effect because with the increase of the level of this proficiency, the acceptability of gaps highly enhances, but RPs are not affected. So RP over-acceptance remains stable across proficiency levels, suggesting that it is impossible for the L2ers to overcome this L1 effect. But acceptance of gaps improves with proficiency, approaching native-like levels in the most proficient learners.

5.4.2.4 The subset of data including non-island structures in the RT analysis

This subset of data will measure the RTs for the region in the sentence containing either a gap or resumptive in non-island structures.

The optimal model for the non-island structures subset is included in the following model specification formula:

Log.Gap.RT ~ as.numeric(Rating) + Chain.Foot * Proficiency + Origin.Clause * Chain.Foot + Tense * L1 + (1|Mother.Sentence) + (1+Chain.Foot|Participant)

The indication of the formula is that the interaction of chain foot and proficiency is taken into consideration in addition to the interaction of chain foot and origin clause and the interaction of tense and L1. All of these factors represent the fixed effects. As for the last two elements of (1|Participant) and (1|MotherSentence), they are treated as random effects. It is to be noted that the random slope and the inclusion of rating in the fixed effect are not significant and they do not improve the model fit, but they are there to control potential confusions. The Log.Gap.Rt is the dependent variable referring to the RT measurement of the segment in the sentence containing either a gap or a resumptive.

To recall the levels of each factor in the model as shown in Table 5-1, chain foot has the two levels of gap and resumptive, origin clause has the two levels of wh-clause and relative, L1 has the two levels of Behdini and English, and tense has the two levels of non-past and past.

Table 5-23 shows the coefficients for the random effects part of the modeling in the non-islands subset of the data in the RT analysis. The table shows that the participant effect allows for more data to vary with the standard deviation rated as 0.5748. This is followed by the mother sentence effect with 0.1705.

Age was also added as a random effect to see whether it has an effect on natives’ and non-natives' reading speed, but it did not affect the reaction time variance in the non-islands subset. The random slope of participants with chain foot is also included but it does not improve the AIC significantly.

Table 5-23: Coefficients for the random effects for the subset of non-island structures in the RT analysis

Random effects:				
Groups	Name	Variance	Std.Dev.	Corr
Participant	(Intercept)	0.33039	0.5748	
	Chain.Footresumptive	0.09738	0.3121	-0.38
Mother.Sentence	(Intercept)	0.02908	0.1705	
Residual		0.57188	0.7562	

Table 5-24 previews the reduction of AIC in an ANOVA comparison for the significant factors that were added to build the optimal model in the non-islands subset of data in the RT measurement analysis. All the coefficients involved in the optimal model are well-supported by low p-values. The table shows that the interaction of chain foot and proficiency and the interaction of chain foot and origin clause form the most important factors in the modeling, with 41.9 as the greatest reduction in AIC and with $p < 0.001$ as a p-value. This is followed by the interaction of chain foot and proficiency with 30.7 as a second largest reduction in AIC. This is followed by the main effect of chain foot with 22.5 as reduction in AIC. The factors involved in the formula of (Chain.Foot * Proficiency + Origin.Clause * Chain.Foot + Tense * L1) with 20 as reduction in AIC come at the end.

The other factors that ended up being insignificant in search for the best model are represented by grammatical role, which increased the AIC with -5.02. Rating was also insignificant neither as a main effect (the increase in AIC is -8), nor in interaction with proficiency (the increase in AIC is -1.3). Moreover, there was no interaction of origin clause and proficiency; origin clause only signs if in interaction with chain foot.

Table 5-24: Model comparison statistics for the subset of non-islands in the RT analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	5004.595	5008.3	1	4992.3	7.449e-07 ***	22.5
Chain.Foot + Grammatical.Role	5009.617	5009.4	2	4988.4	0.14697	-5.02
Chain.Foot * Proficiency	4970.87	4977.6	2	4957.6	2.846e-08 ***	30.7
Chain.Foot * Proficiency + Rating	4970.90	4985.6	3	4967.4	0.1234	-8
Chain.Foot * Proficiency * Rating	4970.95	4978.9	3	4977.8	0.1547	-1.3
Chain.Foot * Proficiency + Origin.Clause * Chain.Foot	4930.769	4935.7	3	4911.7	1.074e-10 ***	41.9
Chain.Foot * Proficiency + Origin.Clause * Chain.Foot + Tense * L1	4914.196	4915.7	5	4885.7	9.836e-06 ***	20

The model yields the estimates for the coefficients shown in Table 5-25, which lists the coefficients for the fixed-effect predictors. The intercept represents the group mean for Chain.Foot=resumptive, Origin.Clause=wh-clause, Tense=non-past, and L1=Behdini. That is to say, this table is calibrated for the reference level of each factor represented by resumptive, wh-clause, non-past, and Behdini.

Table 5-25: Coefficients of a mixed-effect linear model fitted to the log-transformed reaction time data for non-islands (Reference levels: Chain.Foot:resumptive, Origin.Clause:wh-clause, Tense:non-past, L1=Behdini)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	8.95313	0.51554	17.366
as.numeric(Rating)	0.05070	0.02089	2.427
Chain.Footgap	-2.32485	0.25811	-9.007
Proficiency	-1.51993	0.69489	-2.187
Origin.Clauserelative	-0.14684	0.12859	-1.142
Tensepast	-0.19328	0.04026	-4.801
L1English	-0.56994	0.25362	-2.247
Chain.Footgap:Proficiency	1.84751	0.31662	5.835
Chain.Footgap:Origin.Clauserelative	0.52302	0.07758	6.742
Tensepast:L1English	0.20909	0.07436	2.812

Figures 5-8, 5-9, and 5-10 represent visualizations of the main interactions involved in the optimal model for the non-island structures subset of the data in the RT analysis.

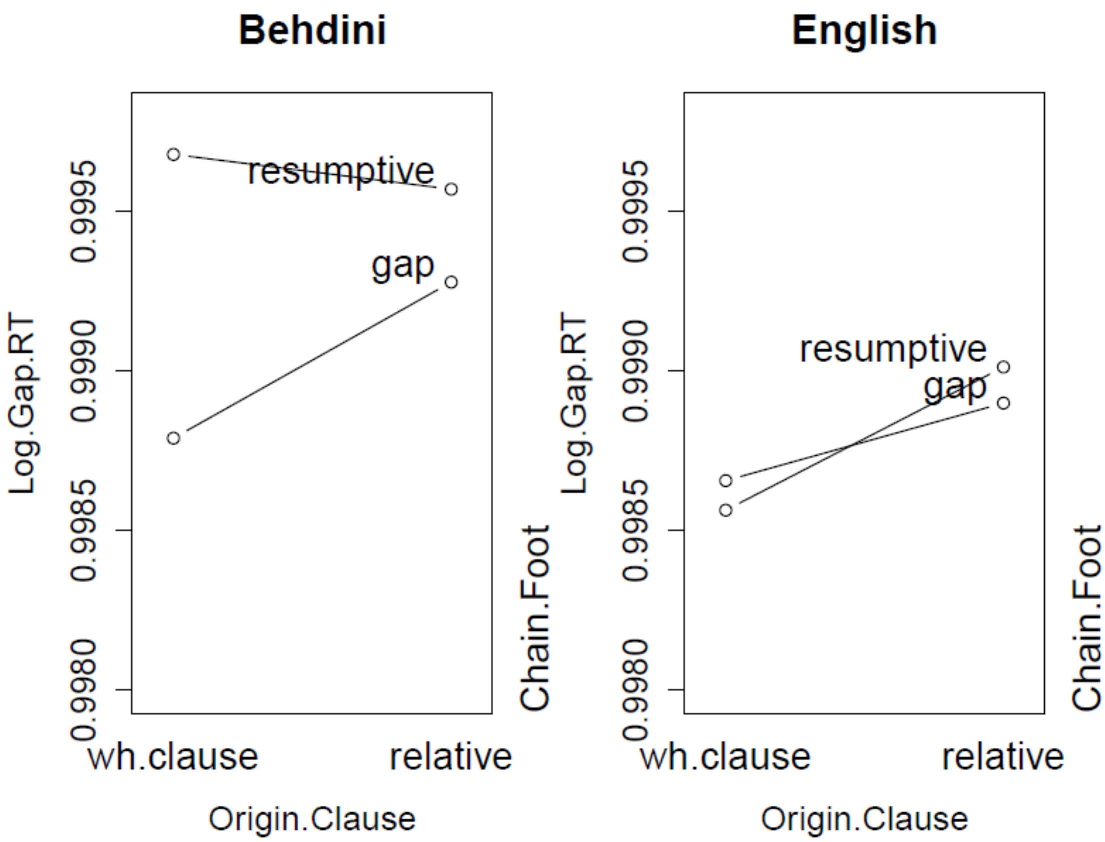

Figure 5-8: Interaction of chain foot, origin clause, and L1 in non-island structures in the RT analysis

Figure 5-8 previews the interaction of whether there is a gap or resumptive, whether the clause type is a relative or a wh-clause, and whether participants' L1 is Behdini or English in non-island conditions.

Taking all the components into account, native speakers made their judgements much faster than Behdini speakers whether there is a gap or resumptive and whether it is acceptance or rejection. This is previewed in Figure 5-8 more clearly.

As for the L2ers, they processed gaps faster than RPs in both relative clauses and wh-clauses, and the difference between gaps and RPs is more robust than that of the native speakers, especially in wh-clauses. Table 5-25 indicates that Behdini learners of English processed gaps in non-island wh-clauses faster than in relative clauses, as the estimate value of Origin.Clauserelative is -0.14684 and the effect size is (t value = -1.142, p<0.001). On the other hand, the estimate value of Chain.Footgap:Origin.Clauserelative is 0.52302, which means that gaps in relative clauses are processed more slowly by Behdini speakers and the effect size is (t value = 6.742, p<0.001).

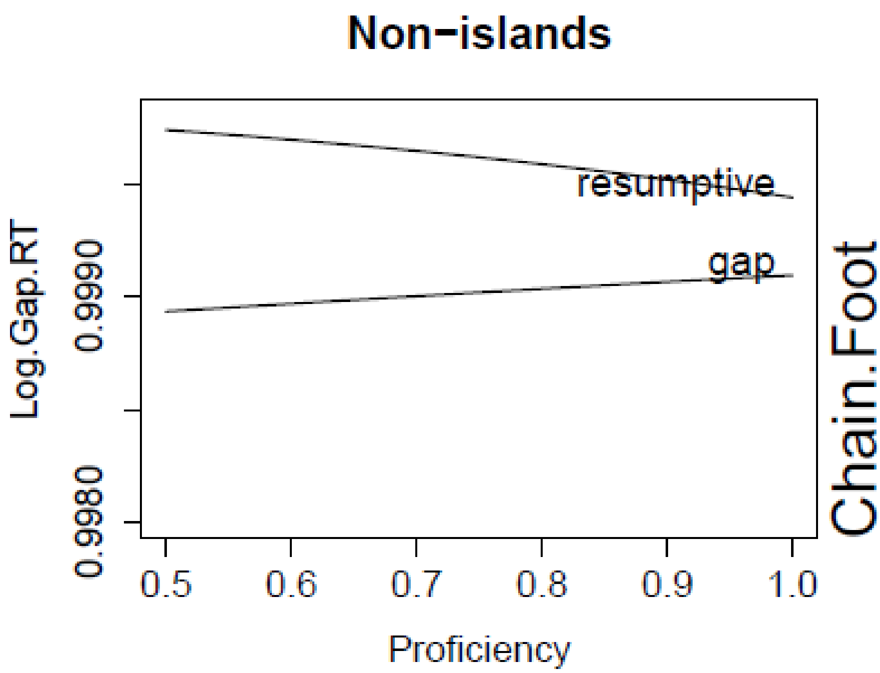

Figure 5-9: Effect of proficiency on the processing of chain foot in non-island structures in the RT analysis with Behdini participants only

Figure 5-9 shows what effect Behdini participants' proficiency level of the English language might have on the speed of processing of gaps and resumptives in non-island structures. This analysis is based on a separately refitted mode with only Behdini participants (see Appendix 9 for the summary table).

The figure shows that with the increase of the proficiency level of L2ers, resumptives are processed significantly more quickly. This is further shown in the summary table in Appendix 9, which shows that the estimate value of Proficiency is -0.87653 and the effect size is (t value = -1.513, p<0.001), indicating that proficiency affects the processing speed of resumptives in non-islands as proficient Behdini speakers process RPs in non-islands faster.

On the other hand, as proficiency increases, the processing of gaps in non-islands also slightly increases. And this is indicated by the estimate value of Chain.Footgap:Proficiency which is 0.79441 and the effect size is (t value = 1.605, p<0.001), meaning that proficiency has an effect in that it slightly increases the speed of processing of gaps in L2ers.

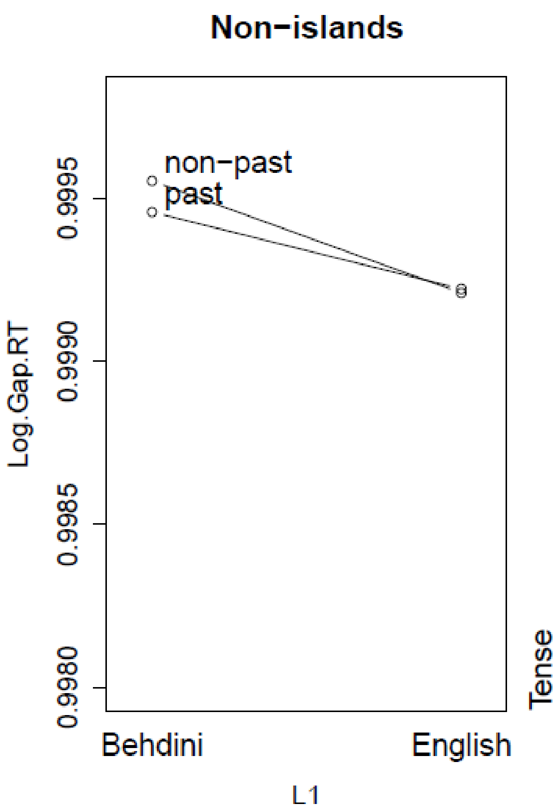

Figure 5-10: Interaction of tense and L1 in non-island structures in the RT analysis

Figure 5-10 shows speed of processing of the interaction of whether the clause is past or non-past and whether L1 is English or Behdini in non-island conditions.

The figure shows that native speakers processed both past and non-past clauses very similarly with non-past clauses being processed slightly faster than past clauses, whereas Behdini speakers processed past clauses faster than non-past clauses; but the difference is slight as shown in Table 5-25, which shows that the estimate value of Tensepast is -0.19328 and the effect size is (t value = -4.801, $p<0.001$). This indicates that Behdini learners' processing of gaps in past tense clauses is slightly faster.

Table 5-25 also previews the interaction of tense and L1 showing that English speakers processed gaps in past tense clauses more slowly, and this is indicated by the estimate value of the Tensepast:L1English, which is 0.20909 and the effects size is (t value = 2.812, $p<0.001$).

In conclusion, the observation from the RT analysis of non-island structures is that in non-island structures the segment at the foot of the chain is processed more slowly in relative clauses if it contains a gap, and in wh-dependencies if it contains a resumptive pronoun. The Behdini speaker's speed of processing at this segment improves with proficiency if the segment contains a resumptive, but not a gap.

5.4.2.5 The subset of data including relative clauses in the accuracy analysis

This subset of data includes only relative clauses comparing the acceptance of resumptives and gaps in island and non-island relative clauses. Possessives, obliques, and subjects have been removed from this subset of data to avoid any confusions as they do not appear in islands. Non-relative clauses islands and relative clauses in long wh-questions were also excluded.

The best model for the relative clauses subset of data in the accuracy analysis is included in the following formula:

Rating ~ Chain.Foot * Island * Proficiency + L1 + (1|Mother.Sentence) + (1|Participant)

The formula shows that the interaction of the three elements of chain foot, island, and proficiency plus the main effect of L1 form the factors that control the variability of acceptability patterns in the relative clauses subset of the data and thus they make up the optimal model. As for the last two elements of (1|Mother.Sentence) and (1|Participant), they are random effects.

Table 5-26 lists the coefficients for the random effects in the relative clauses subset of data. The table shows that the participant effect allows for more data to vary with the standard deviation measured as 0.6349. The standard deviation for the mother sentence effect is 0.4065. However, the participant variation effect fails to converge with the random intercept and it fails to converge with chain foot and island as random slopes.

Table 5-26: Coefficients for the random effects for the subset of relative clauses in the accuracy analysis

Random effects:			
Groups	Name	Variance	Std.Dev.
Participant	(Intercept)	0.4031	0.6349
Mother.Sentence	(Intercept)	0.1652	0.4065

Figure 5-11 shows Behdini and English speakers' individual variation in relative clauses, which measures the random effect for participant to see which group of speakers shows more individual variation.

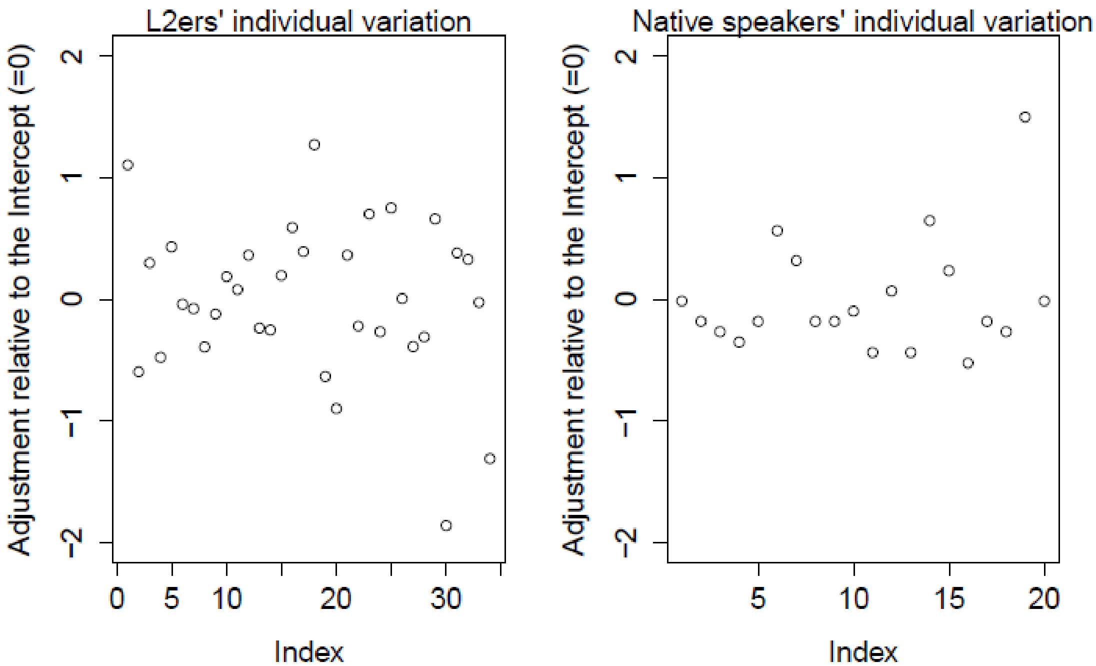

Figure 5-11: Individual variation of native speakers and L2ers for the random effect of participant in relative clauses

Figure 5-11 shows that both groups of speakers demonstrate a range of individual variation in relative clauses. The native English judgements show less individual variation than the L2ers. It can be observed that L2ers have a substantial negative adjustment of the intercept (i.e. this is slightly different compared with native speakers). However, this individual variation of L2ers does not correlate with proficiency.

Table 5-27 is an ANOVA comparison that lists the reduction in AIC for the significant factors that were added to build the optimal model in the relative clauses subset of data. The table shows that the factors involved in the three-way interaction of chain foot, island, and proficiency are the most important elements in the relative clauses analysis as they have scored the largest reduction in AIC with 367.7 with a significant p value equaling $p < 0.00000000000000022$. This is followed by chain foot as a main effect with 67.8

as reduction in AIC. This is followed by chain foot and island in interaction with 36.5 as reduction in AIC, whereas chain foot and island as main effects scored 16.9 as reduction in AIC. This is followed by the formula, Chain.Foot * Island * Proficiency + L1, with 5.2 as reduction in AIC.

Regarding the factors that ended up not being significant, L1 as a main effect was not significant and the AIC is hardly reduced with only 0.3. Proficiency as a main effect was not significant as it increased the AIC with -2.1, but as shown above proficiency was significant in interaction with chain foot and island. Tense was not significant neither as a main effect (AIC is increased with -1.1) nor in interaction with L1 (AIC is increased with -2.7).

Table 5-27: Model comparison statistics for the subset of relative clauses in the accuracy analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	3672	4691.7	1	4683.7	< 2.2e-16 ***	67.8
Chain.Foot + Island	3671	4674.8	2	4664.8	1.363e-05 ***	16.9
Chain.Foot * Island	3670	4638.3	2	4626.3	5.725e-10 ***	36.5
Chain.Foot * Island + L1	3669	4638.0	3	4624.0	0.1245	0.3
Chain.Foot * Island + Proficiency	3669	4640.1	3	4626.1	1	-2.1
Chain.Foot * Island * Proficiency	3666	4270.3	3	4250.3	< 2.2e-16 ***	367.7
Chain.Foot * Island * Proficiency + L1	3665	4265.1	4	4243.1	0.007371 **	5.2
Chain.Foot * Island * Proficiency + L1 + Tense	3664	4266.2	5	4242.2	0.3319	-1.1
Chain.Foot * Island * Proficiency + L1 * Tense	3663	4267.8	5	4241.8	0.5139	-2.7

Table 5-28 shows the coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference level for chain foot is resumptive, for L1 is Behdini, and for island is no. As for Rating, it is A denoting full grammaticality, so the intercept is set for the likelihood of a degraded acceptability.

Table 5-28: Coefficients of a generalised linear mixed model fitted to the acceptability data for non-islands (Reference levels: Chain.Foot: resumptive, L1: Behdini, Island: no)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-1.9598	0.6415	-3.055	0.00225 **
Chain.Footgap	5.6244	0.3704	15.184	< 2e-16 ***
Islandyes	1.3330	0.8452	1.577	0.11477
Proficiency	2.5554	0.8739	2.924	0.00345 **
L1English	0.8738	0.3194	2.735	0.00623 **
Chain.Footgap:Islandyes	-6.3735	1.1349	-5.616	1.96e-08 ***
Chain.Footgap:Proficiency	-8.1182	0.4661	-17.417	< 2e-16 ***
Islandyes:Proficiency	-0.8407	1.0199	-0.824	0.40975
Chain.Footgap:Islandyes:Proficiency	10.2728	1.5030	6.835	8.21e-12 ***

Figure 5-12 and 5-13 are visual representations showing the main interactions of the four main factors of the optimal model in the relative clauses subset of data, which are chain foot, island, L1, and proficiency.

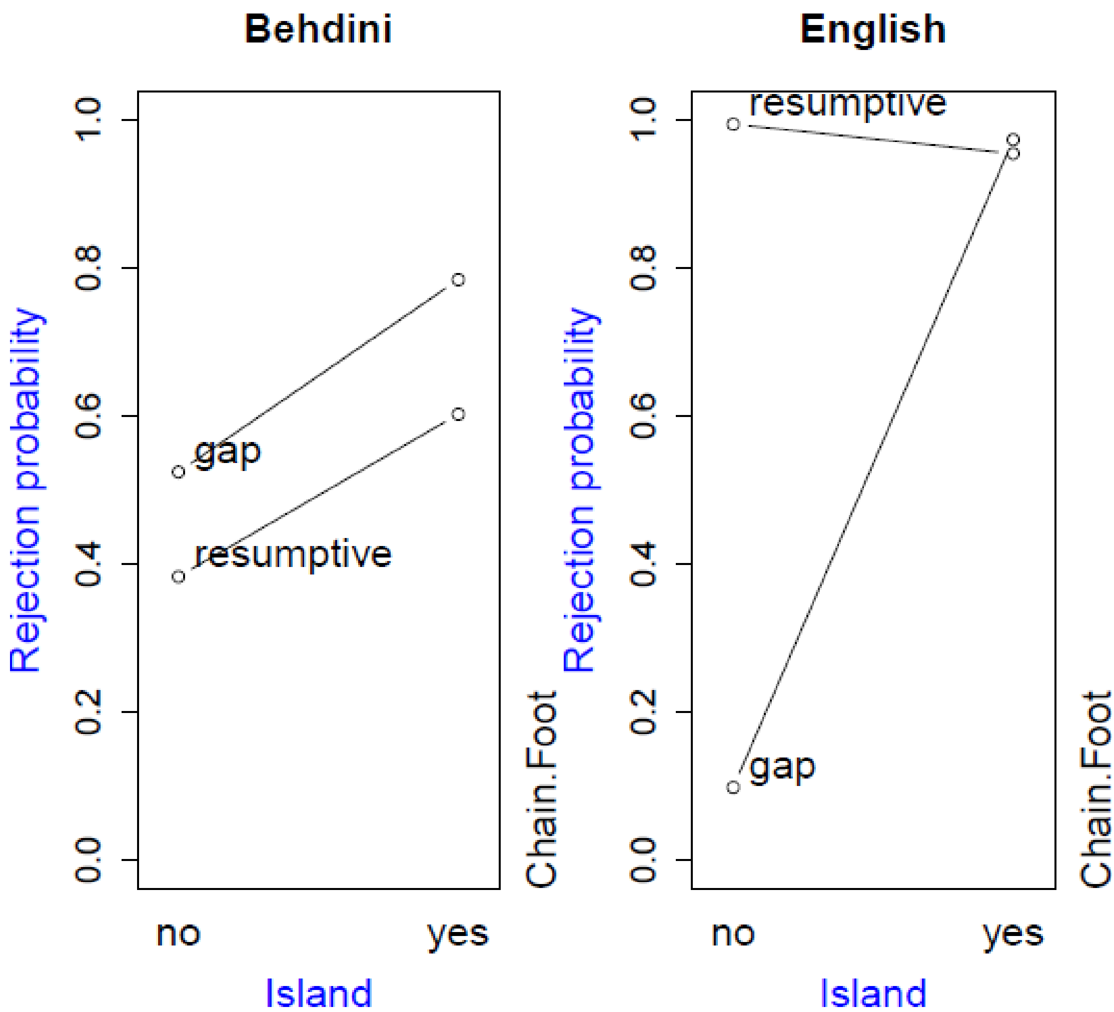

Figure 5-12: Interaction of chain foot, island, and L1 in relative clauses in the accuracy analysis

Figure 5-12 shows that in general Behdini speakers accept resumptives more than native speakers both in islands and in non-islands.

In non-island relative clauses, native speakers categorically reject RPs and accept gaps. This is supported in Table 5-28 as the estimate value of L1English is 0.8738, meaning that English native speakers tended to reject RPs in non-islands almost categorically and significantly, and the effect size is (Z value = 2.735, p<0.001). On the other hand, English native speakers tended to accept gaps categorically in non-island relative clauses. Native speakers generally reject relative clauses in islands, with a marginal reduction in rejection rates if there was an RP.

The non-native speakers, on the other hand, did not have categorical judgements, and they preferred RPs over gaps both in islands and in non-islands. They showed sensitivity to islands, marked by a significant but moderate increase in rejection rates, which was more marked with gaps than with RPs.

The Behdini learners preferred RPs over gaps in non-island relative clauses in this subset of analysis which includes only objects. This seems to contradict the pattern in the previous analysis in which Behdini learners prefer gaps over RPs. However, the previous model includes object and subject non-island relative clauses. This explains the contradiction as we are dealing with two different subsets of data for relative clauses not in islands.

Behdini speakers prefer resumptives in non-islands to resumptives in islands, as clear in Table 5-28 which shows that the estimate value of Chain.Footgap is 5.6244 and the effect size is (Z value = 15.184, $p<0.001$), indicating that Behdini speakers' rating of gaps in non-island relative clauses is very low compared to resumptives.

By linking the findings from Figure 5-12 to the results in Table 5-28, we can observe that Behdini learners show some sensitivity to islands, in that they reject gaps in islands significantly more than in non-islands (as shown in Table 5-28). However, they do not reject islands with RPs significantly more than non-islands with gaps.

Native speakers, on the other hand, are more categorical in their judgements: islands are rejected significantly more than non-islands, and RPs only marginally rescue island violations. RPs are categorically rejected in non-islands.

The interaction between chain foot and islandhood is robust in the native speakers, but very marginal in the Behdini learners.

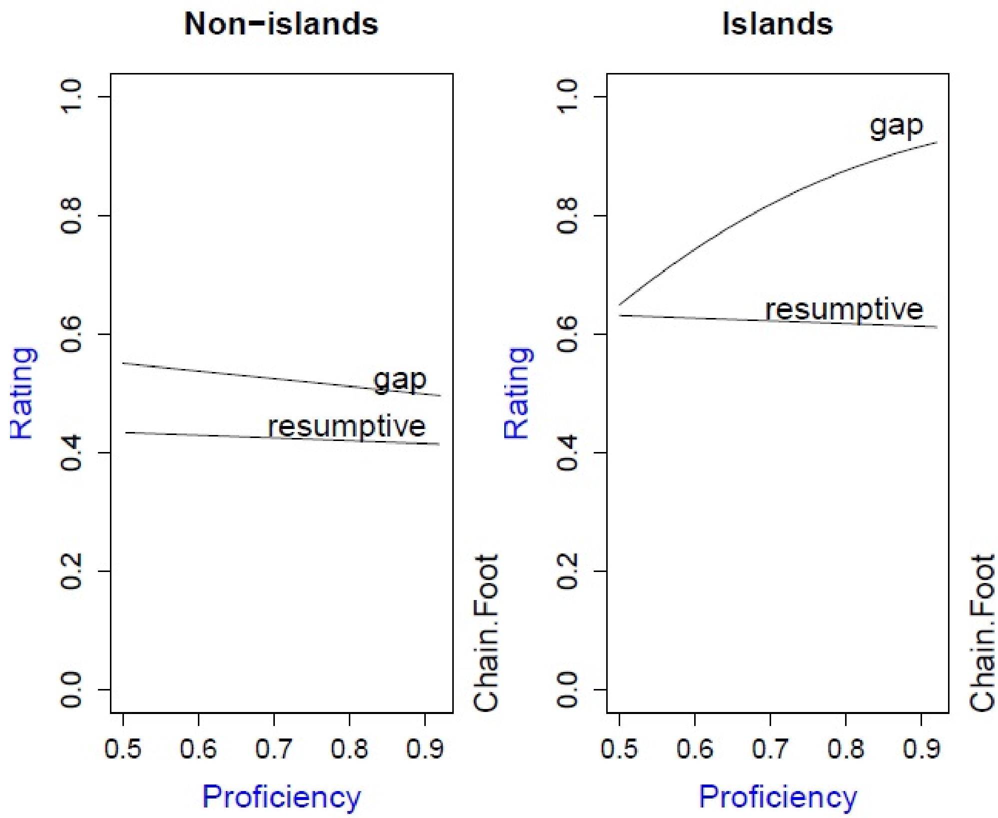

Figure 5-13: Effect of Behdini learners' proficiency on chain foot and islands in relative clauses in the accuracy analysis (with Behdini participants only)

Figure 5-13 shows the effect of Behdini learners' proficiency level of English on their judgements regarding gaps and RPs and islands and non-islands in relative clauses. It is to be noted that a separate model has been run with only Behdini participants to measure the effect of proficiency (see Appendix 10 for the summary table). The figure shows that one effect that proficiency triggers is in island conditions in which the increase of proficiency leads to increase the rejection of gaps, and this goes towards a more native-like performance. The acceptance of resumptives, however, does not enhance with the increase of proficiency. In non-islands, on the other hand, proficiency only slightly enhances the acceptance of gaps, but RPs are still not affected by proficiency.

5.4.2.5 The subset of data including relative clauses in the RT analysis

This subset of data includes only relative clauses to measure the RTs for gaps and resumptives in island and non-island relative clauses. Possessives, obliques, and subjects have been removed from this subset of data to avoid any confusions as they do not appear in islands. Non-relative clauses islands and relative clauses in long wh-questions are also excluded.

The optimal model for the relative clauses subset of data in the RT analysis is represented in the following formula:

Log.Gap.RT ~ Chain.Foot * L1 * Tense + Island * Chain.Foot * Proficiency + (1|Mother.Sentence) + (1+Island * Chain.Foot|Participant)

The formula indicates that chain foot (gap vs. resumptive), tense (whether the clause is in non-past or past tense), and L1 (Behdini vs. English) are taken into account in a three-way interaction in addition to the three-way interaction of island (non-island vs. island), chain foot (gap vs. resumptive), and proficiency. These are all fixed effects. As for the last two elements of (1|Mother.Sentence) and participant, they are treated as random effects in the model. The random effect of participant converges with chain foot as a random slope and interacts with the island random intercept.

Table 5-29 shows the coefficients for the random effects in the relative clauses subset of data in the RT analysis. The table shows that the participant effect allows for more data to vary with the standard deviation measured as 0.5617. The standard deviation for the mother sentence effect is 0.1191 with a lesser effect on the speed variability than participants. Age, as a random effect, proved not to have any effects on the reaction time variability of the relative clauses data. The random effect of participant converges with the random slope of chain foot and interacts with island. The standard deviation for Islandyes:Chain.Footresumptive is 0.4989, meaning that the value of participant variation increases when the clause is island and there is a resumptive.

Table 5-29: Coefficients for the random effects for the subset of relative clauses in the RT analysis

Random effects:				
Groups	Name	Variance	Std.Dev.	Corr
Participant	(Intercept)	0.31552	0.5617	
	Islandyes	0.11379	0.3373	-0.54
	Chain.Footresumptive	0.08433	0.2904	-0.42 0.61
	Islandyes:Chain.Footresumptive	0.24888	0.4989	0.61 -0.73 -0.85
Mother.Sentence	(Intercept)	0.01419	0.1191	
Residual		0.52440	0.7242	

Table 5-30 is an ANOVA comparison that lists the reduction in AIC for the significant factors that were added to build the optimal model in the relative clauses subset of data in the RT analysis. All the coefficients are supported by low and significant p-values. The table shows that the predictors participated in the formula of (Chain.Foot * L1 * Tense + Island * Chain.Foot) are the most important elements in the RT measurement for the relative clauses because they have scored the highest reduction in AIC, which is 34.1, and the p-value is $p < 0.001$. This is followed by the three-way interaction of chain foot, L1, and tense with 29.7 as reduction in AIC. This is followed by the interaction of chain foot and L1 with 19.4 as reduction in AIC. The elements of the formula of (Chain.Foot * L1 * Tense + Island * Chain.Foot * Proficiency) come next with 14.9 as reduction in AIC. This is followed by elements involved in the formula, Chain.Foot * L1 * Tense + Island, with 13.9. Finally, this is followed by chain foot as a main effect with 4.8 as reduction in AIC. Rating as a main effect proved not to be significant and it increased the AIC level with -0.7, and in interaction with L1 it was also not significant as it increased the AIC with -9.7.

Table 5-30: Model comparison statistics for the subset of relative clauses in the RT analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	8519.639	8540.1	1	8512.1	0.009213 **	4.8
Chain.Foot + Rating	8479.214	8540.8	2	8512.9	0.193	-0.7
Chain.Foot + Rating * L1	8480.218	8549.8	3	8612.9	0.129	-9.7
Chain.Foot * L1	8501.87	8520.7	2	8488.7	8.571e-06 ***	19.4
Chain.Foot * L1 * Tense	8480.609	8491.0	3	8451.0	1.262e-07 ***	29.7
Chain.Foot * L1 * Tense + Island	8467.957	8477.1	4	8435.1	6.875e-05 ***	13.9
Chain.Foot * L1 * Tense + Island * Chain.Foot	8434.353	8443.0	5	8399.0	1.792e-09 ***	34.1
Chain.Foot * L1 * Tense + Island * Chain.Foot * Proficiency	8411.768	8428.1	5	8376.1	0.0001349 ***	14.9

Table 5-31 lists the coefficients for the fixed-effect predictors. The intercept represents the group mean calibrated for the reference level of each factor. The reference (or default) level for tense is non-past, chain foot is gap, for L1 is Behdini, and for island is no. As for LogGapRT, it is the RT measurement for the gap or resumptive region in the sentence.

Table 5-31: Coefficients of a linear mixed-effect model fitted to the RT data for relative clauses (Reference levels: Tense: non-past, Chain.Foot: resumptive, L1: Behdini, Island: no)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	7.59647	0.48146	15.778
Chain.Footgap	-0.39670	0.27175	-1.460
L1English	-0.96486	0.23871	-4.042
Tensepast	-0.23725	0.04140	-5.731
Islandyes	2.14195	0.34172	6.268
Proficiency	0.17595	0.65783	0.267
Chain.Footgap:L1English	0.11639	0.13398	0.869
Chain.Footgap:Tensepast	0.16179	0.05777	2.801
L1English:Tensepast	0.24138	0.08329	2.898
Chain.Footgap:Islandyes	-2.46849	0.45843	-5.385
Islandyes:Proficiency	-1.51548	0.40386	-3.752
Chain.Footgap:Proficiency	0.31006	0.36371	0.852
Chain.Footgap:L1English:Tensepast	-0.10606	0.10765	-0.985
Chain.Footgap:Islandyes:Proficiency	2.06011	0.55651	3.702

Figures 5-14, 5-15, and 5-16 are visual representations showing the combined effects of the five main factors of the optimal model in the RT measurement of relative clauses subset of data, which are tense, L1, chain foot, proficiency, and island.

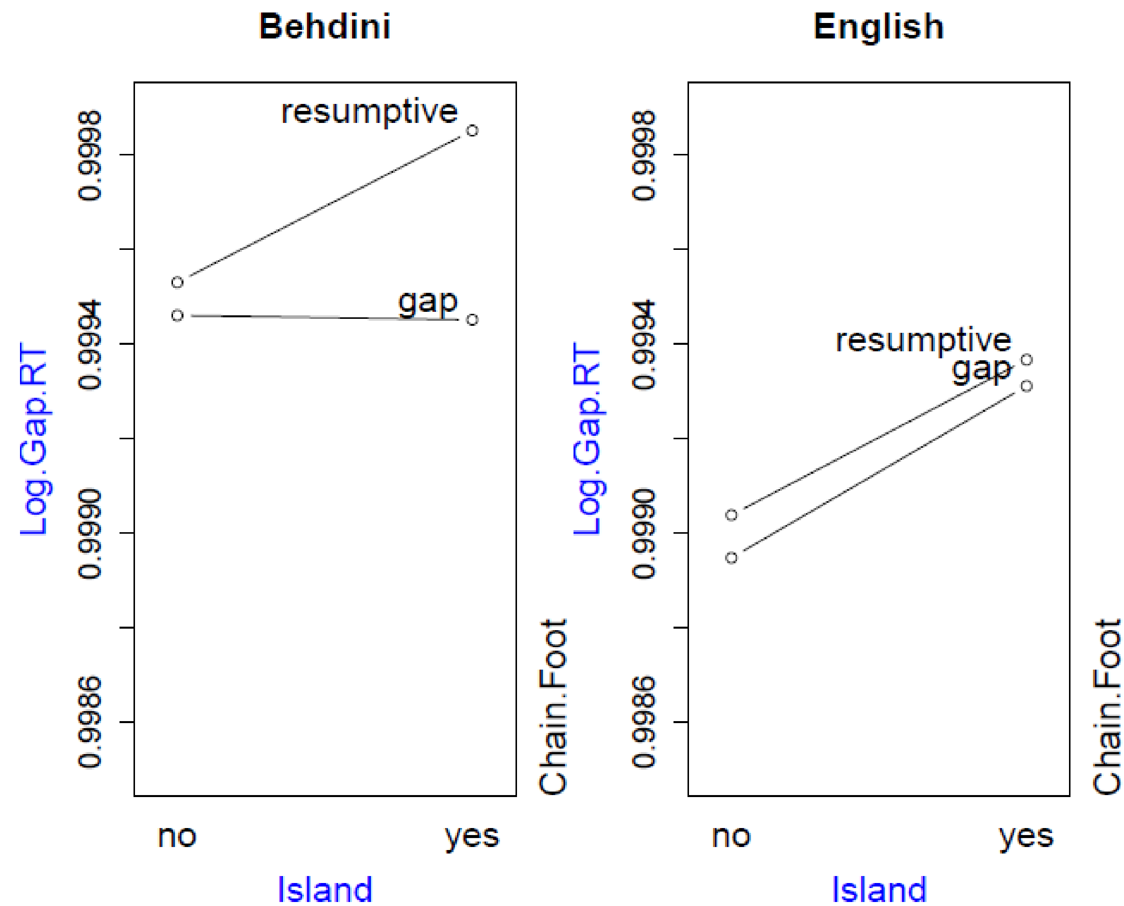

Figure 5-14: Effect of chain foot and island in relative clauses in the RT analysis

The figure shows the RT measurement for the gap or resumptive region of the sentence in relative clauses as judged by Behdini and English speakers when the relative clause with either island or non-island interacted with chain foot with either a gap or a resumptive pronoun. The figure shows that native speakers have completed this part of the test faster than Behdini speakers over all of the components.

The main observation from Figure 5-14 is that the general tendency is for slower reading times of the segment at the foot of the chain when it is in an island, except for the L2 speakers when there is a gap. L2 speakers are also generally slower, as expected. Table 5-31 supports the observation that native speakers tended to be slow in processing gaps in islands as the estimate value of Chain.Footgap:Islandyes is -2.46849 and the effect size is (t value = -5.385, $p<0.001$). As for L2ers, they processed gaps faster than RPs in islands as the estimate value of Islandyes is 2.14195 and the effect size is (t value = 6.268, $p<0.001$).

A number of interesting results can be observed from Figure 5-14 and Table 5-31. The difference between RPs and gaps in native speakers does not seem to be significant with only slightly faster reading times for gaps both in islands and non-islands.

Behdini learners, on the other hand, processed gaps quite similarly in both island and non-island structures. The difference between islands and non-islands is not significant with the presence of gaps. L2 speakers, however, processed RPs in non-island conditions significantly faster than gaps. This is because Behdini tolerates resumptives in non-islands. And this is significantly indicated in Table 5-31, as the estimate value of Chain.Footgap is -0.39670, whereas the estimate value of Chain.Footresumptive is -0.05701 (this is based on a separate model refitted with gap as reference level). These estimates indicate that Behdini speakers processed RPs in relative clauses significantly faster than gaps. The effect size for RPs in non-islands is (t value = 1.785, $p<0.001$), whereas for gaps it is (t value = -1.460, $p<0.001$). The observation that gaps take longer for L2 speakers makes sense, as the preference in their L1 is for RPs in relative clauses.

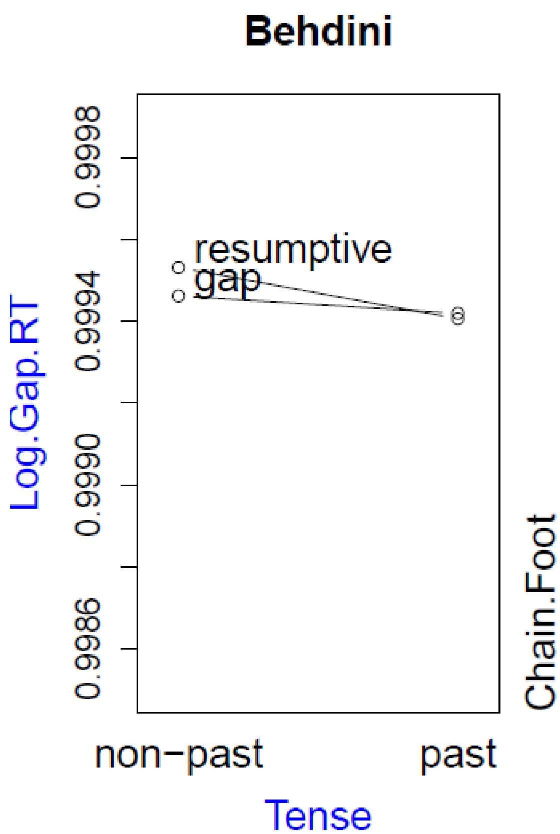

Figure 5-15: Effect of tense and chain foot in relative clauses in the RT analysis

Figure 5-15 shows the measurement of RTs for gaps and RPs in relative clauses when the clause is either in non-past or past tense, whether the clause contains a gap or a resumptive, and when L1 corresponds to Behdini.

L2 speakers tended to be slow in processing past tense clauses with RPs as the estimate value of Tensepast is -0.23725 and the effect size is (t value = -5.731, p<0.001), whereas they were faster in processing gaps in past tense clauses as the estimate value of Chain.Footgap:Tensepast is 0.16179 and the effect size is (t value = 2.801, p<0.001). This difference is significant when the effect size for RPs in non-past clauses is compared with the effect size for gaps.

The figure shows that for the L2 speakers, there is no significant difference between past and non-past clauses in reading speed of gaps. The reading speed of RPs in past tense clauses is faster than in non-past clauses.

In Behdini, past tense clauses have ergative argument structure, and for this subset of data, which are all object chains, evidence has been provided in Chapter 4 which states that the agreement morpheme on the V functions as an RP. It could be that the presence of an RP in non-past clauses (which correspond to accusative structures in Behdini) increases the impact of the presence of an RP in those structures in their L1, and that this translates into their L2 processing.

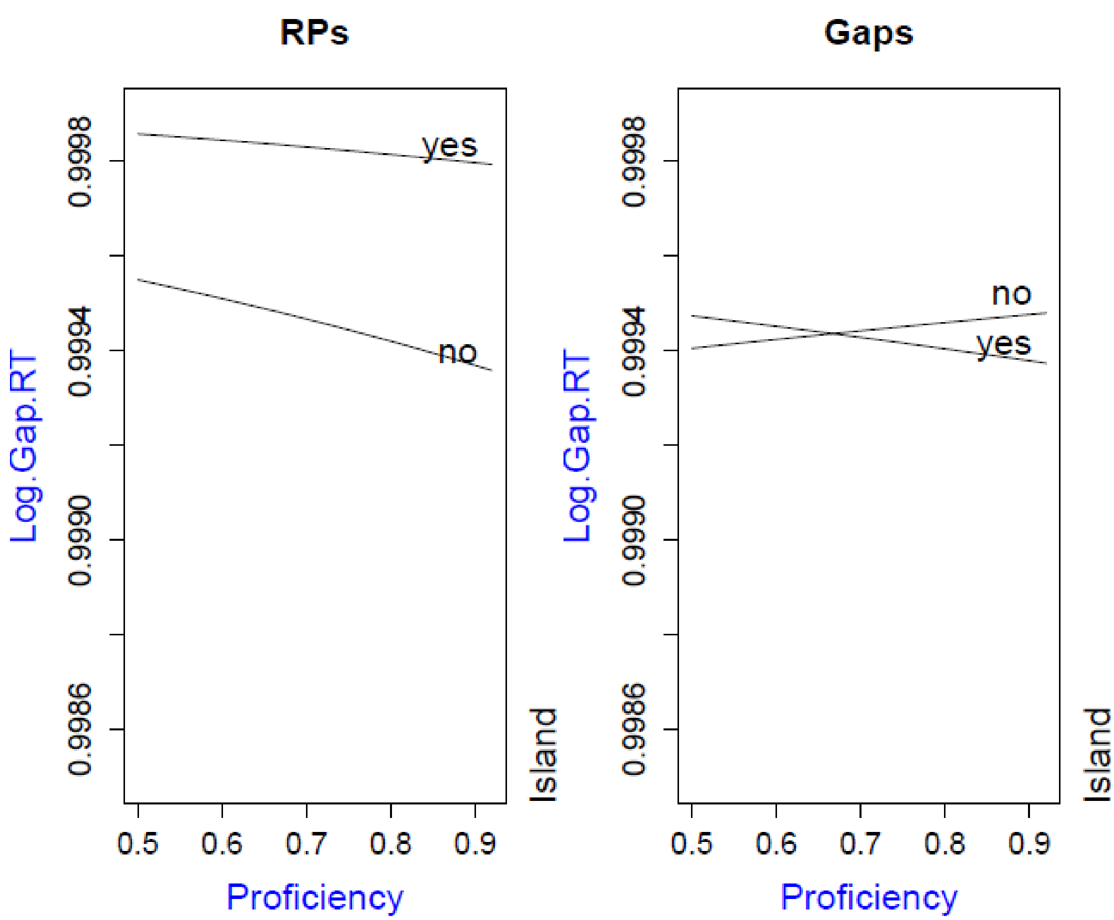

Figure 5-16: Effect of Behdini speakers' proficiency on the processing of relative clauses in the RT analysis (with Behdini participants only)

Figure 5-16 measures the effect of Behdini speakers' proficiency level of the English language on their processing speed of gaps and RPs in island and non-island relative clauses. This is based on a model that has been refitted for L2 learners only (see Appendix 11 for the summary table).

The figure shows that with the increase of the proficiency level, the processing of RPs both in island and non-island structures speeds up. On the other hand, with the increase of proficiency, the processing of gaps in non-islands speeds up but in islands it becomes slower.

The table in Appendix 11 shows that with the increase of proficiency, all judgement patterns become faster, except in gaps in non-islands which become slower, as the estimate value of Chain.Footgap:Proficiency is 1.16207 and the effect size is (t value = 2.828, p<0.001), indicating that L2ers processed gaps in non-islands more slowly as the proficiency increases.

The estimate value of Proficiency is -0.84330, indicating that proficiency tended to make the processing of RPs in non-islands faster, and the effect size is (t value = -1.536, p<0.001). The estimate value of Chain.Footgap:Islandyes:Proficiency is -0.68156, indicating that with the increase of proficiency gaps in islands are processed faster, and the effect size is (t value = -0.941, p<0.001). The estimate value of Islandyes:Proficiency is -0.05183, and this shows that RPs in islands are processed faster as proficiency increases, and the effect size is (t value = -0.086, p<0.001).

5.4.2.6 The subset of data including only islands in the accuracy analysis

This subset of data looks at only island clauses to compare the use of resumptives and gaps in all island types based on the Origin.Clause predictor (the four types of islands). This subset of data includes only object clauses which have fully crossed variables that are all islands including adjuncts, sentential subjects, relatives, and wh-clauses.

The best model of the islands subset of data is included in the following formula:

Rating ~ Chain.Foot * L1 * Origin.Clause + Chain.Foot * Proficiency + (1|Mother.Sentence) + (1|Participant)

The formula indicates that acceptability patterns vary according to the three-way interaction of chain foot, origin clause, and L1, in addition to the interaction of proficiency and chain foot. These factors are fixed effects. As for mother sentence and participant, they are treated as random effects. The participant factor converges with the random slope for chain foot, but it killed off the interaction of L1 and chain foot, which improved the fit of the model more. The participant factor did not converge with the random slope for origin clause.

Table 5-32 lists the coefficients for the random effects part of the formula represented by participant and mother sentence. Mother sentence accounts for a slightly higher range of variance in this subset of data because its standard deviation is 0.9101, whereas it is 0.5556 for the participant.

Table 5-32: Coefficients for the random effects for the islands subset of data in the accuracy analysis

Random effects:			
Groups	Name	Variance	Std.Dev.
Participant	(Intercept)	0.3087	0.5556
Mother.Sentence	(Intercept)	0.8283	0.9101

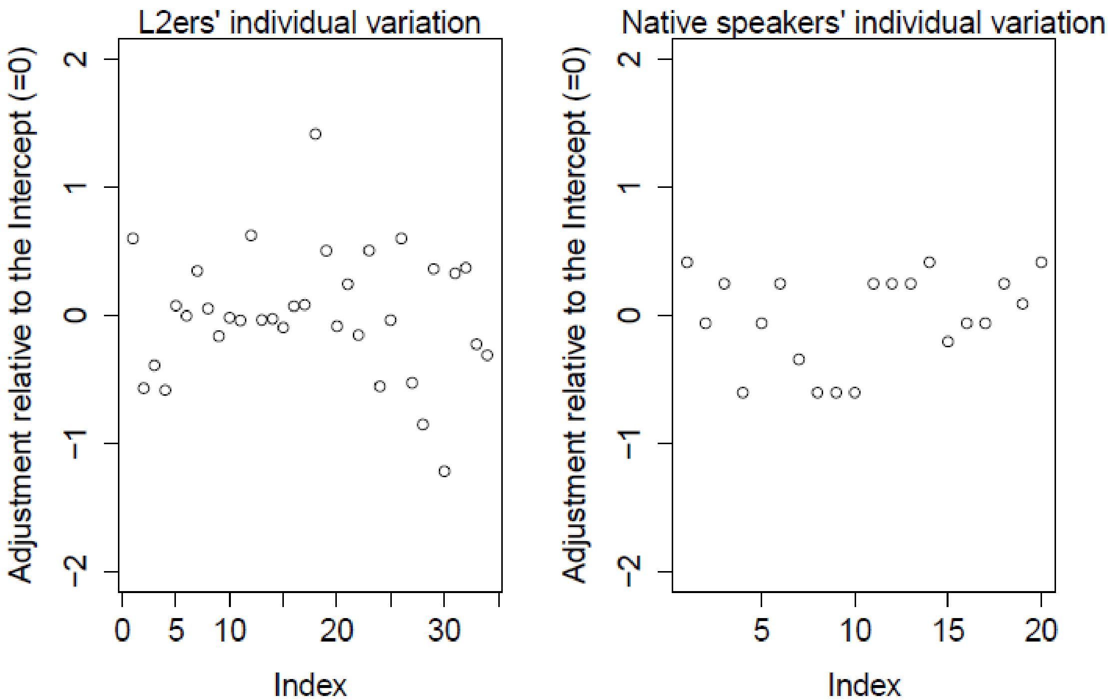

Figure 5-17: Individual variation of native speakers and L2ers for the random effect of participant in islands

Figure 5-17 shows Behdini and English speakers' individual variation in islands, which measures the random effect for participant to see which group of speakers shows more individual variation.

The figure shows that the L2 speaking group accounts for more individual variation than the English native speaking group. The figure shows that many L2ers have a substantial negative adjustment of the intercept (i.e. this is different if compared with native speakers). However, they do not converge with proficiency.

Table 5-33 lists the reduction in AIC in an ANOVA summary for the modeling in the islands subset of data. It shows that the two factors of chain foot and L1 as main effects are the most important elements in the modeling because they have scored the highest reduction in AIC which is 55.1 with a significant and low p-value. This is followed by the elements involved in the three-way interaction of chain foot, L1, and origin clause, with 36.3 as reduction in AIC. This is followed by the main effect of chain foot with 26 as reduction in AIC. This is followed by the interaction of chain foot and L1 with 13.3 as reduction in AIC. Finally, this is followed by the formula: Chain.Foot * L1 * Origin.Clause + Chain.Foot * Proficiency, with 9.5 as reduction in AIC.

Tense proved to be not significant and it did not improve the fit of the model as it increased the AIC level with -1. Proficiency, as a main effect, was also not significant and it resulted in increasing the AIC wit -1.5.

Table 5-33: Model comparison statistics for the islands subset of data in the accuracy analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	2589	2679.3	1	2671.3	1.194e-07 ***	26
Chain.Foot + L1	2588	2624.2	2	2614.2	4.127e-14 ***	55.1
Chain.Foot * L1	2587	2610.9	2	2598.9	9.516e-05 ***	13.3
Chain.Foot * L1 * Origin.Clause	2575	2574.6	3	2538.6	1.942e-08 ***	36.3
Chain.Foot * L1 * Origin. Clause + Tense	2574	2575.6	4	2540.8	0.125	-1
Chain.Foot * L1 * Origin.Clause + Proficiency	2574	2576.1	4	2538.1	0.4975	-1.5
Chain.Foot * L1 * Origin.Clause + Chain.Foot * Proficiency	2573	2565.1	4	2525.1	0.001165 **	9.5

Table 5-34 lists the coefficients for the fixed-effects part of the formula in the islands subset of data. The default levels for chain foot is resumptive, origin clause is adjunct, L1 is Behdini, and Rating is A denoting full grammaticality.

Table 5-34: Coefficients of a generalised linear mixed model fitted to the acceptability data for the islands (Reference levels: Chain.Foot: resumptive, Origin.Clause: adjunct, L1: Behdini)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.06050	0.74386	0.081	0.935178
Chain.Footgap	-1.08648	0.58504	-1.857.	0.063297 .
L1English	2.90574	0.46991	6.184	6.27e-10 ***
Origin.Clauserelative	1.01595	0.70371	1.444	0.148820
Origin.Clausesentential.subject	1.12328	0.48937	2.295	0.021713 *
Origin.Clausewh.clause	1.04201	0.64459	1.617	0.105976
Proficiency	-0.78682	0.86620	-0.908	0.363688
Chain.Footgap:L1English	-1.42508	0.61971	-2.300	0.021472 *
Chain.Footgap:Origin.Clauserelative	-0.13286	0.32367	-0.410	0.681446
Chain.Footgap:Origin.Clausesentential.subject	-0.08208	0.29250	-0.281	0.779003
Chain.Footgap:Origin.Clausewh.clause	-0.73289	0.30812	-2.379	0.017379 *
L1English:Origin.Clauserelative	-0.58894	0.62011	-0.950	0.342248
L1English:Origin.Clausesentential.subject	-1.29804	0.46315	-2.803	0.005069 **
L1English:Origin.Clausewh.clause	1.66416	0.82875	2.008	0.044640 *
Chain.Footgap:Proficiency	2.84489	0.79245	3.590	0.000331 ***
Chain.Footgap:L1English:Origin.Clauserelative	0.48036	0.93661	0.513	0.608044
Chain.Footgap:L1English:Origin.Clausesential.subject	0.61013	0.71803	0.850	0.395478
Chain.Footgap:L1English:Origin.Clausewh.clause	-2.75614	0.90683	-3.039	0.002371 **

Figures 5-18 and 5-19 visualize the coefficients of the best model in the islands subset of data. They show the interaction of origin clause, chain foot, and proficiency when L1 corresponds to English and to Behdini.

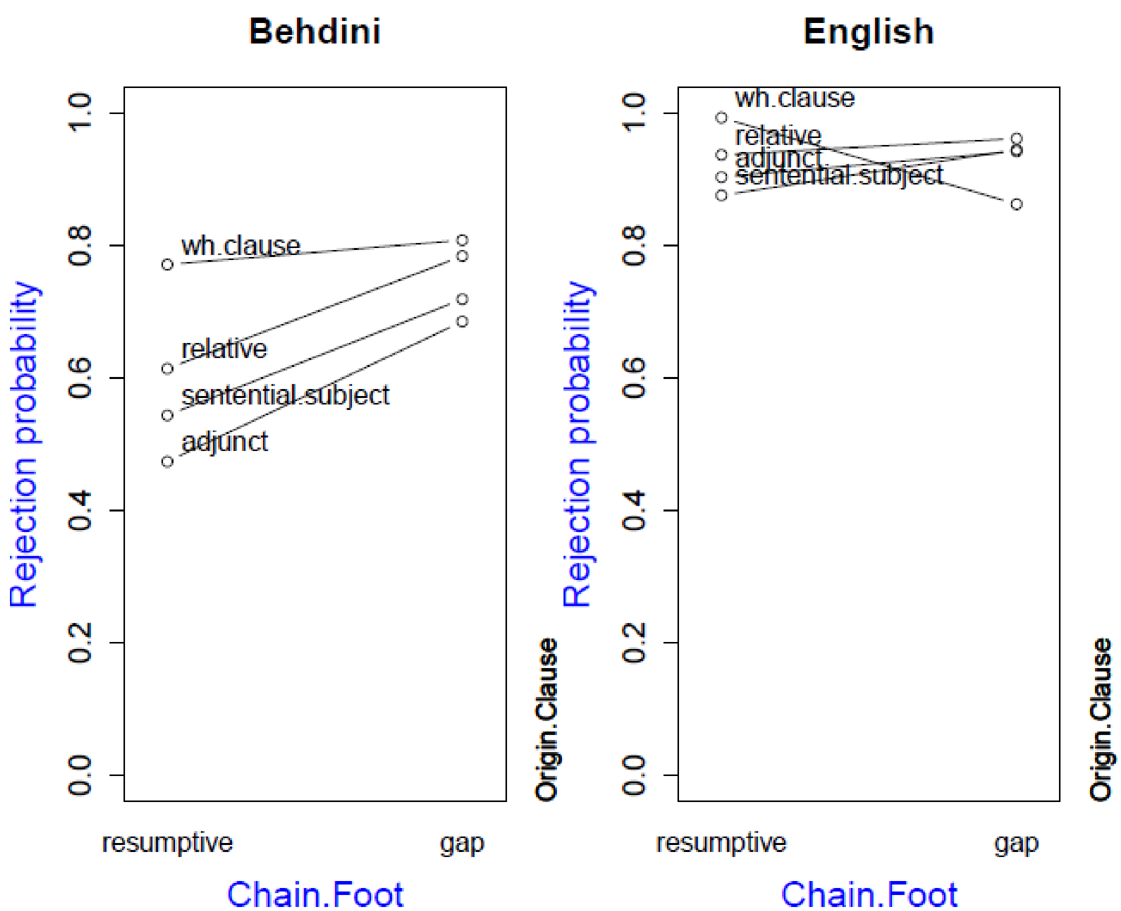

Figure 5-18: Interaction of chain foot, origin clause, and L1 in islands in the accuracy analysis

Figure 5-18 previews that native speakers of English prefer resumptive pronouns over gaps in sentential subject, adjunct, and relative islands, but they prefer gaps to resumptives in wh-islands. Behdini speakers accepted more resumptives than native speakers in general. Wh-clauses behave differently in both groups.

It can be observed that with L2ers there is a marked improvement with RPs, except wh-clauses, which looks stronger than with native speakers.

This figure indicates that Behdini learners have either acquired the resumptives in islands indicated by their high acceptance of RPs or they have positively transferred their L1 parameter, which allows for RPs to apear optionally in island conditions. However, they did accept gaps more than they should, compared to the native speakers.

Regarding the effect of island types, as shown in Table 5-34, when the island is a sentential subject, the acceptance rate of gaps reaches its peak with Behdini speakers, as the estimate value of the Chain.Footgap:Origin.Clausesentential.subject is -0.08208 and the effect size is (Z value = -0.281, p<0.001). When it is a relative clause, acceptance of gaps by Behdini learners is still high but less than sentential subject, as the estimate value of the Chain.Footgap:Origin.Clauserelative is -0.13286 and the effect size is (Z value = -0.410, p<0.001). However, the rate of acceptability of gaps in wh-clause islands is low, and this is indicated by the estimate value of Chain.Footgap:Origin.Clausewh.clause, which is -0.73289 and the effect size is (Z value = -2.379, p<0.001). The difference observed by origin clause (island types) is statistically significant only in wh-clause islands.

The figure also shows that when L1 corresponds to English (that is, when participants' first language is English in island structures) the rejection rate of gaps increases.

Finally, the interaction of chain foot and island types shows that resumptive pronouns are accepted the most in adjunct islands by Behdini learners. When the island type is a sentential subject, resumptive pronouns are also accepted. When the island is a wh-clause, resumptive pronouns are rejected.

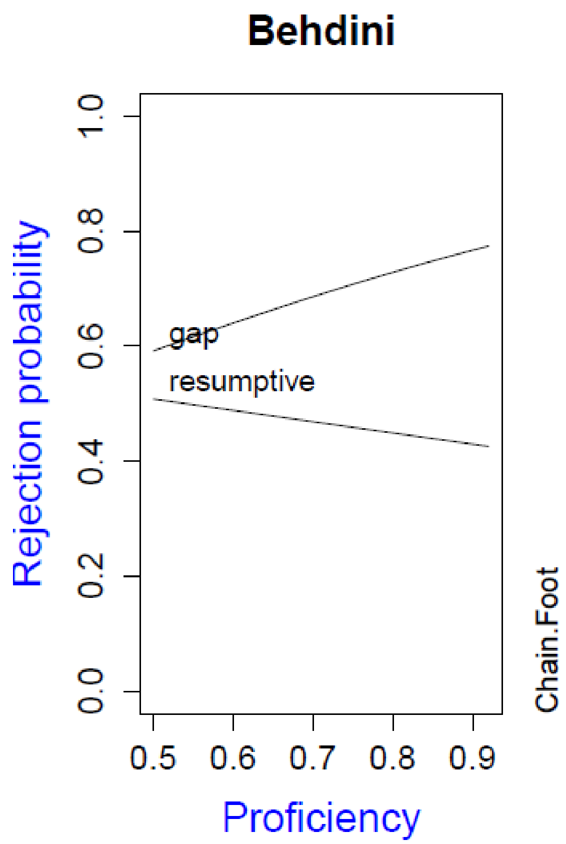

Figure 5-19: Effect of Behdini learners' proficiency in accepting gaps and RPs in islands in the accuracy analysis (with Behdini participants only)

Figure 5-19 shows the effect of proficiency on the judgement of gaps and RPs on island configurations. This is based on a separate model that has been refitted with L2 speakers only (see Appendix 12 for the summary table).

Regarding the interaction of proficiency and chain foot, as proficiency increases acceptability of RPs and rejection of gaps increase greatly denoting a more native-like performance. This is indicated in the table in Appendix 12 which shows that the estimate value of Proficiency is -0.79003 and the effect size is (Z value = -0.888, p<0.001), meaning that as proficiency increases, the rate of acceptability of gaps reduces. This is a hint that proficient Behdini learners are more native-like than less proficient learners. The estimate value of Chain.Footgap:Proficiency is 2.84177 and the effect size is (Z value = 3.590, p<0.001) with a significant p value (p<0.000331), which indicates that proficiency leads to increase the acceptability rate of RPs in islands.

5.4.2.7 The subset of data including only islands in the RT analysis

This subset of data measures the RTs for the gap and resumptive regions of the sentences in only island clauses to compare all island types based on the Origin.Clause factor (the four types of islands). This subset of data includes object chains which only show fully crossed variables that are all islands including adjuncts, sentential subjects, relatives, and wh-islands.

The best RT measurement model of the islands subset of data is included in the following formula:

Log.Gap.RT ~ Chain.Foot * L1 * Origin.Clause + as.numeric(Rating) + (1|Mother.Sentence) + (1+Chain.Foot+Rating|Participant)

The formula indicates that chain foot, L1, and origin clause are taken into account in a three-way interaction in addition to the main effect of rating (treated numerically). These four factors are fixed effects. As for participant and mother sentence, they are treated as random effects. As shown in the formula, the participant effect converges with the random slopes for chain foot and rating.

Table 5-35 shows the coefficients for the random effects part of the formula represented by participant and mother sentence. Participant accounts for a higher range of variance in this subset of data because its standard deviation is 0.41420, whereas it is 0.12223 for the mother sentence. Age was also tested as a random effect, but it proved to have no effects on the reaction time variability in the islands subset of data. The standard deviation for the convergence of participant and chain foot when it corresponds to a resumptive pronoun is 0.27120 and the correlation is -0.14, meaning that more participants judged quickly on RPs in contrast to gaps in islands.

Table 5-35: Coefficients for the random effects for the islands subset of data in the RT analysis

Random effects:				
Groups	Name	Variance	Std.Dev	Corr
Participant	(Intercept)	0.171565	0.41420	
	Chain.Footresumptive	0.073550	0.27120	-0.14
Mother.Sentence	(Intercept)	0.014941	0.12223	
Residual		0.333863	0.57781	

Table 5-36 represents an ANOVA comparison for the significant factors added to build the optimal model in the RT analysis of islands and it shows the decrease in AIC. As shown in the table, all the coefficients are well-supported by low p-values. The table shows that the predictors of chain foot and L1 in interaction are considered the most important elements in the modeling as they scored the highest reduction in AIC, which is 77.9. This is followed by chain foot as a main effect, with 38.1 as reduction in AIC. This is followed by the formula, Chain.Foot * L1 * Origin.Clause + as.numeric(Rating), with 23.5 as reduction in AIC. And this is followed by the three-way interaction of chain foot, L1, and origin clause, with 18 as reduction in AIC. This is followed by the formula, (Chain.Foot * L1 * Origin.Clause), with 7.4 as reduction in AIC. The main effects of chain foot and L1 scored 7 as reduction in AIC. Movement type and tense led to an increase in the AIC.

The interaction of as.numeric(Rating) and L1 is not significant and it hardly improved the model fit as the reduction in AIC is only 1.2. Tense is not significant and it increased the AIC with -1. Proficiency, as a main effect, is not significant as it increased the AIC with -23.2 and it is also not significant in interaction with chain foot, and the increase in AIC is -25.

Table 5-36: Model comparison statistics for the islands subset of data in the RT analysis

	df.resid	AIC	Df	Deviance	Pr(>Chisq)	Reduction in AIC
Chain.Foot	4996.7	5028.4	1	4990.4	2.397e-10 ***	38.1
Chain.Foot + L1	4990.127	5021.4	2	4981.4	0.002619 **	7
Chain.Foot * L1	4914.673	4943.5	2	4901.5	< 2.2e-16 ***	77.9
Chain.Foot * L1 + Origin.Clause	4911.051	4936.1	3	4888.1	0.003792 **	7.4
Chain.Foot * L1 * Origin.Clause	4904.54	4918.1	3	4852.1	3.973e-05 ***	18
Chain.Foot * L1 * Origin.Clause + Tense	4873.958	4919.1	4	4858.1	0.1269	-1
Chain.Foot * L1 * Origin.Clause + as.numeric(Rating)	4889.301	4894.6	4	4822.6	1.78e-06 ***	23.5
Chain.Foot * L1 * Origin.Clause + as.numeric(Rating) * L1	4891.212	4893.4	4	4815.4	0.06397	1.2
Chain.Foot * L1 * Origin.Clause + Proficiency	4901.772	4917.8	4	4849.8	1	-23.2
Chain.Foot * L1 * Origin.Clause + Proficiency * Chain.Foot	4901.71	4919.6	4	4849.6	1	-25

Table 5-37 lists the coefficients for the RT measurement of the fixed-effects part of the formula in the islands subset of data. The intercept value is calibrated for the reference (default) level of the factors mentioned in the formula above. The reference level for chain foot is gap, for origin clause is adjunct, for L1 is Behdini, and for rating is A.

Table 5-37: Coefficients of a linear mixed-effect model fitted to the RT data for islands (Reference levels: Chain.Foot: resumptive, Origin.Clause: adjunct, L1: Behdini, Rating:D)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	8.54934	0.09673	88.39
Chain.Footgap	-1.17278	0.06740	-17.40
L1English	-1.26642	0.13971	-9.06
Origin.Clauserelative	0.11388	0.11007	1.03
Origin.Clausesentential.subject	0.10741	0.08829	1.22
Origin.Clausewh.clause	-0.02588	0.10003	-0.26
as.numeric(Rating)2	0.20315	0.03634	5.59
as.numeric(Rating)3	0.11092	0.04338	2.56
as.numeric(Rating)4	0.02486	0.05299	0.47
Chain.Footgap:L1English	1.00432	0.11890	8.45
Chain.Footgap:Origin.Clauserelative	-0.11540	0.08299	-1.39
Chain.Footgap:Origin.Clausesentential.subject	-0.12686	0.07520	-1.69
Chain.Footgap:Origin.Clausewh.clause	-0.38930	0.07568	-5.14
L1English:Origin.Clauserelative	-0.07650	0.11214	-0.68
L1English:Origin.Clausesentential.subject	0.01452	0.09286	0.16
L1English:Origin.Clausewh.clause	-0.24915	0.09698	-2.57
Chain.Footgap:L1English:Origin.Clauserelative	0.22326	0.15107	1.48
Chain.Footgap:L1English:Origin.Clausesentential.subject	0.25848	0.13084	1.98
Chain.Footgap:L1English:Origin.Clausewh.clause	0.56062	0.13165	4.26

Figures 5-20 and 5-21 visualize the RT measurements for the coefficients of the best model in the islands subset of data. These figures are RT measurements for the interaction between origin clause (types of islands), chain foot (gap vs. resumptive), and L1 (Behdini vs. English) in islands, plus the effect of rating.

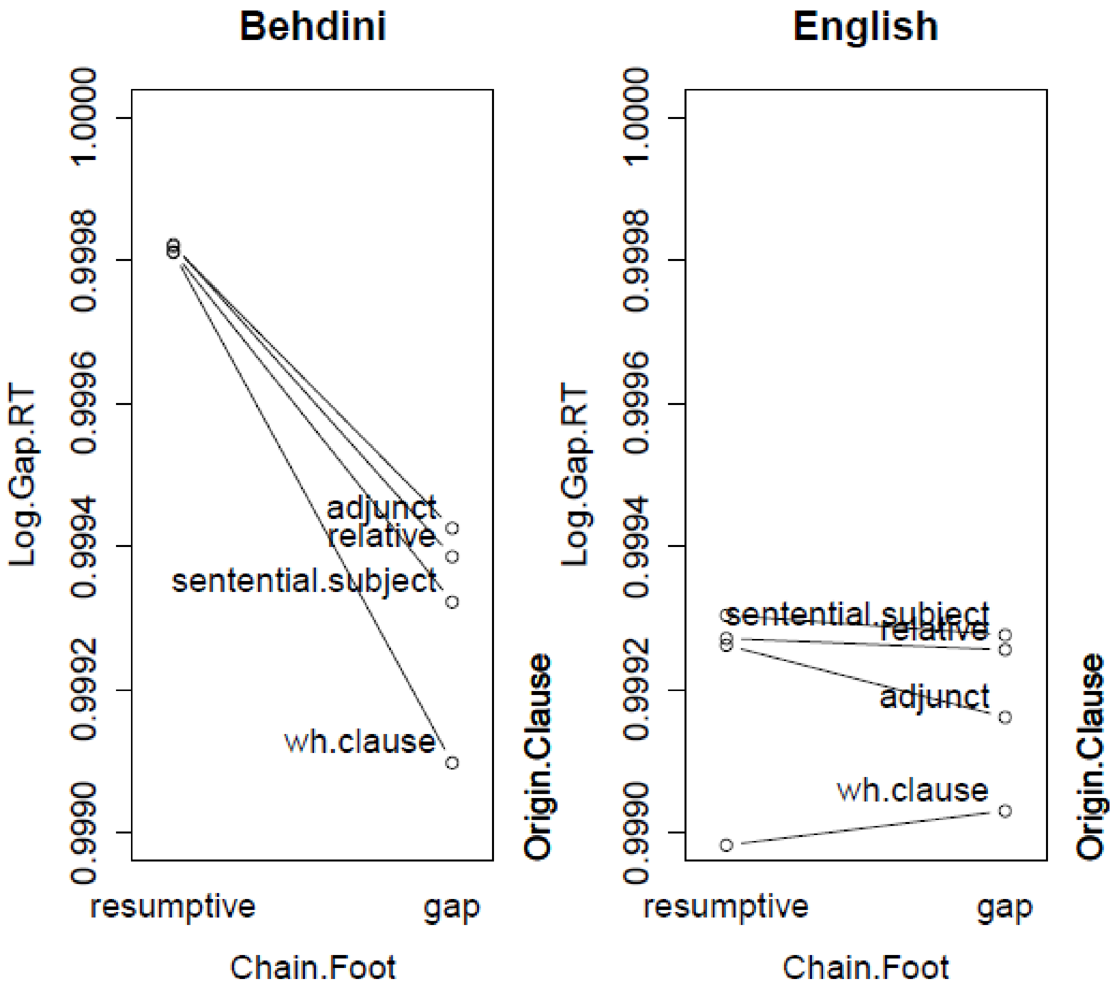

Figure 5-20: RT measurement for the interaction of origin clause, chain foot, and L1 in islands

Figure 5-20 shows that native speakers processed RPs in islands significantly faster than L2ers who processed gaps categorically faster than RPs over all of the four island types.

Behdini learners processed gaps much faster than RPs. This is clearly shown in Table 5-37 which shows that Behdini learners processed gaps in adjuncts faster as the estimate value of Chain.Footgap is -1.17278 and the effect size is (t value = -17.40, p<0.001). The estimate value of Origin.Clauserelative is 0.11388 and the effect size is (t value = 1.03, p<0.001), and the estimate value of

Chain.Footgap:Origin.Clauserelative is -0.11540 and the effect size is (t value = -1.39, p<0.001), indicating that Behdini learners processed gaps faster than RPs in relative islands. The estimate value of Origin.Clausesentential.subject is 0.10741 and the effect size is (t value = 1.22, p<0.001), and the estimate value of Chain.Footgap:Origin.Clausesentential.subject is -0.12686 and the effect size is (t value = -1.69, p<0.001), and this shows that Behdini learners processed gaps faster than RPs in sentential subject islands. The estimate value of Origin.Clausewh.clause is -0.02588 and the effect size is (t value = -0.26, p<0.001), whereas the estimate value of Chain.Footgap:Origin.Clausewh.clause is -0.38930 and the effect size is (t value = -5.14, p<0.001), indicating that L2 learners processed gaps in wh-clause islands faster than RPs.

The difference in the reading speed between RPs and gaps is very similar with native English speakers, except for adjunct islands in which gaps are processed faster than RPs. This is supported in Table 5-37 which shows that native speakers processed RPs in adjunct islands faster, as the estimate value of L1English is -1.26642 and the effect size is (t value = -9.06, p<0.001). And the estimate value of Chain.Footgap:L1English is 1.00432 and the effect size is (t value = 8.45, p<0.001), showing that natives processed gaps in adjunct islands slowly.

Table 5-37 clearly shows the similar speed of processing between RPs and gaps with native speakers because the estimate value of the L1English:Origin.Clauserelative is -0.07650 and the effect size is (t value = -0.68, p<0.001), whereas the estimate value of Chain.Footgap:L1English:Origin.Clauserelative is 0.22326 and the effect size is (t value = 1.48, p<0.001), indicating that English speakers processed RPs slightly faster than gaps in relative islands. The estimate value of L1English:Origin.Clausesentential.subject is 0.01452 and the effect size is (t value = 0.16, p<0.001), whereas the estimate value of Chain.Footgap:L1English:Origin.Clausesentential.subject is 0.25848 and the effect size is (t value = 1.98, p<0.001), and this shows that native speakers processed RPs similarly to gaps in sentential subject islands. The estimate value of L1English:Origin.Clausewh.clause is -0.24915 and the effect size is (t value = -2.57, p<0.001), whereas the estimate value of Chain.Footgap:L1English:Origin.Clausewh.clause is 0.56062 and the effect size is (t value = 4.26, p<0.001), and this means that native speakers processed RPs slightly faster than gaps in wh-clause islands.

RPs in sentential subject islands are processed the most slowly by English speakers, followed by RPs in adjunct islands and gaps are processed faster in these two island types. This slowness of processing in adjuncts and sentential subjects further supports what is reported by Sprouse and Hornstein (2013) that English resumptives are most demanding in these two island types because extraction of adjunct and subject islands is not possible. Therefore, English participants have processed them difficultly and relatively slowly.

Behdini speakers processed RPs in islands very slowly compared to gaps, which were processed quickly. This might indicate that Behdini speakers prefer gaps in islands over RPs, and this might further indicate their limited sensitivity to RPs in island structures.

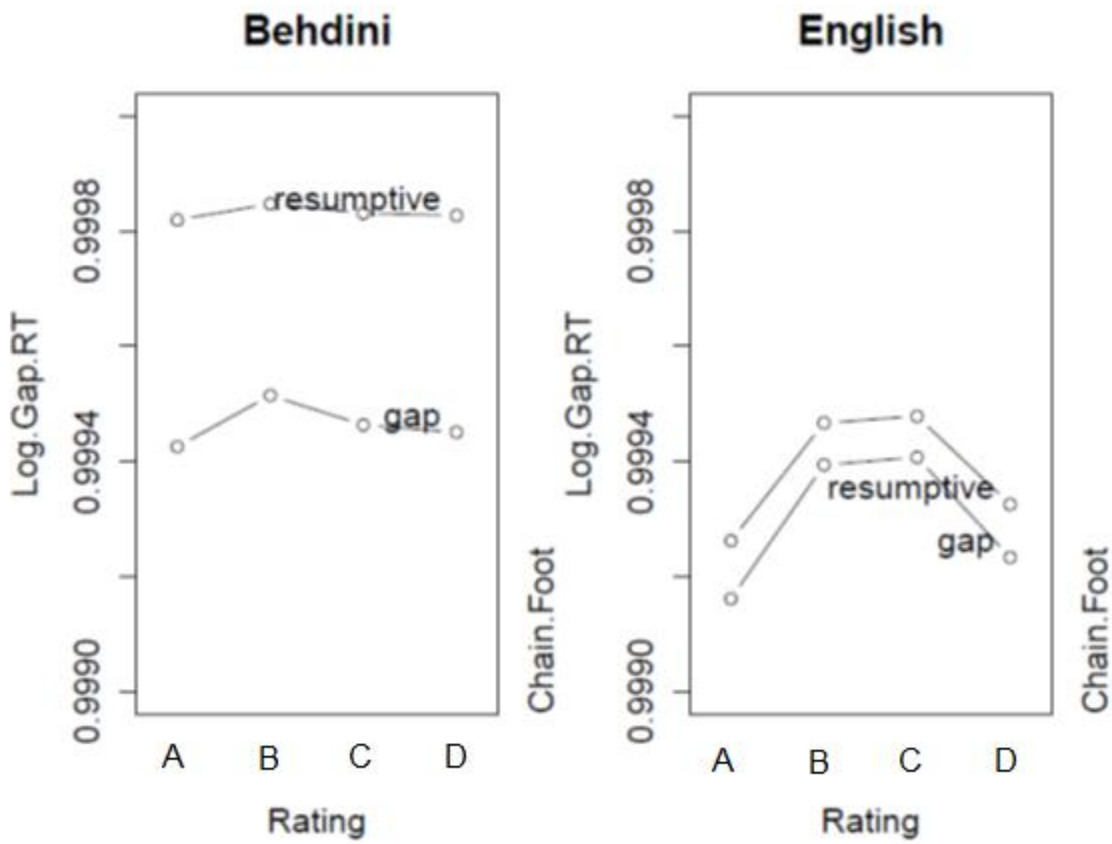

Figure 5-21: RT measurement for the effect of rating on chain foot in islands

Figure 5-21 shows that native speakers processed grammatical sentences slightly faster than ungrammatical sentences. L2 learners, however, processed grammatical and ungrammatical sentences in a similar speed.

5.4.3 General discussion

This general discussion will provide a summary of the main findings of the two analyses included in the study to outline their implications for current models of sentence comprehension and processing. Then this discussion will detail how these results address the research questions that informed this empirical study. Additionally, the results will be discussed in the context of previous research studies, both on L2 acquisition and L2 processing.

The main two research questions that will guide this discussion are as follows:

1- What is the status of resumptive pronouns in the interlanguage of Behdini learners of English? In other words, how do L2 learners go from a grammar featuring apparent resumption to one featuring intrusive resumption?

2- Can Behdini learners of English acquire wh-dependencies including traces (in wh-questions and relative clauses)?

This discussion is an attempt to answer all the hypotheses listed in Section 5.1.1.2 with which it is ordered accordingly.

The first hypothesis predicts that the L2 learners will initially analyse wh-dependencies as anaphoric dependencies, resulting in under-acceptance of structures with gaps in islands, over-acceptance of structures with RPs in and out of islands, and limited sensitivity to islands resulting in over-acceptance. This prediction was found to be true because in view of the results of possessive structures in the accuracy analysis, Behdini speakers almost categorically accepted RPs and rejected gaps (see Figure 5-2). Moreover, in subject and object non-islands, both native speakers and L2 speakers preferred gaps over RPs. However, native speakers categorically accepted gaps and rejected RPs, but Behdini speakers did not reject resumptives in relative clauses significantly more than gaps (see Figure 5-6). Behdini speakers, in particular, highly accepted resumptives equally in relative clauses but with a clear preference for gaps in wh-clauses. Native speakers, on the other hand, highly rated gaps as acceptable in both wh-clauses and relative clauses and they preferred them over resumptives very highly and significantly. This indicates that Behdini speakers acquired gaps in non-island constructions, but they over-accepted resumptives especially in short wh-clauses and slightly in relative clauses. This might be due to the effect of their native language which allows gaps in non-island structures. The patterns of RPs vs. gaps in these structures including subject and object clauses, in which

Behdini preferentially allows RPs, has been reflected clearly in Behdini speakers' judgements as they have preferred RPs to gaps, even though they have also accepted the gaps. As proficiency increases, however, more gaps are accepted, but RPs are still accepted (see Figure 5-6).

This shows that L2 speakers have been following the grammar of their native language without setting the parameter into the English variation, and this led to the transfer of the RPs from their native language into their English interlanguage. This is in line with the predictions of the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007), as the uninterpretable features (here resembled by RPs in possessive structures) have resisted resetting for the L2 learners. Therefore, Behdini learners clearly accepted RPs in possessive structures where they were ungrammatical in English. Even highly proficient learners are not sensitive to the English setting as proficiency proved to have no effects in this subset of analysis.

As for non-possessive structures, one cannot conclude that there is less transfer because of two reasons: First, we do not have data from beginners. Second, the relevant part of the grammar can be transferred with the probability weight of Behdini (i.e. as a variable option). In fact, the latter point is assumed in all cases: possessives, non- islands, and islands; with different probability weights in each case (motivated by different factors). Therefore, Behdini learners seem to have transferred the use of RPs from their L1 into their English interlanguage.

There is a marked difference between wh-questions and relative clauses in the grammar of L2ers, in that RPs tend to be rejected much more in the former. This can be captured in terms of competition between two parameter settings: analysing wh-dependencies as anaphoric dependencies (allowing RPs) or wh-chains (not allowing RPs). In the L2ers’ interlanguage, the weightings of these grammars varies according to the structure (relative clause vs. wh-question). The native speakers’ grammar features no such difference.

These findings are, therefore, compatible with the Variational Learning Hypothesis (Slabakova, 2008), as the gap/RP parametric setting is not completely lost in L1 Behdini-L2 English acquisition, as L2ers have acquired gaps but were unable to reset the RP setting into the L2 parameter. The two grammars continue to compete at relatively high activation levels in the interlanguage of L2ers, even at high proficiency levels.

Behdini learners over-accepted the RPs, and at the same time they accepted gaps almost equally to the acceptance rate of native speakers. Moreover, RP over-acceptance remains stable across proficiency levels, suggesting that it is impossible for the L2ers to overcome this L1 effect. But acceptance of gaps improves with proficiency (approaching native-like levels in the most proficient learners). This pattern is compatible with the Inhibition Hypothesis (De Cat et al., 2015). This is because Behdini L2 learners of English have over-accepted RPs (that are L1-driven) even at advanced stages of proficiency. This is conditioned by difficulties in inhibiting this prominent trait of the L1, and this has continued despite the fact that learners' judgements demonstrate a target-like pattern regarding structures with gaps.

L2 learners' inability to reject RPs is also compatible with the predictions of the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2007).

Looking at the accuracy analysis of object relative clauses subset of data, it is shown that Behdini speakers accept more RPs than native speakers in both islands and non-islands. In non-islands, L2ers preferred more RPs than in islands, which is completely different from native speakers who preferred RPs in islands over RPs in non-islands (Figure 5-12). Native speakers categorically prefer gaps in non-islands over islands. Therefore, it can be argued that Behdini speakers are less sensitive to the interaction of RPs and islands. Behdini learners, however, show a marginal sensitivity to islands, as they reject gaps in islands significantly more than in non-islands. However, they do not reject islands with RPs significantly more than non-islands with gaps. Non-native speakers do not have categorical judgements, and they preferred RPs over gaps in both islands and non-islands. They showed sensitivity to islands, marked by a significant but moderate increase in rejection rates, which was more marked with gaps than with RPs.

Native speakers, on the other hand, are more categorical in their judgements: islands are rejected significantly more than non-islands, and RPs only marginally rescue island violations. RPs are categorically rejected in non-islands. The interaction between chain foot and islandhood is robust in the native speakers, but quite marginal in the Behdini learners.

Even though Behdini speakers accepted RPs in islands, which is the only environment where English speakers prefer them, we may understand this to be due to transfer from L1, rather than a correct acquisition of English grammar. This is further supported because L2ers processed islands with gaps faster than islands with RPs. In addition to the fact that Behdini learners also accepted RPs in non-island conditions. These two observations further support the conclusion that it could be a transfer from L1 rather than a correct acquisition.

Therefore, the hypothesis that Behdini learners of English will initially analyse wh-dependencies as anaphoric dependencies is true. This is because Behdini L2ers did not accept structures with gaps in non-islands (see Figure 5-2); they over-accepted structures with RPs inside and outside of island structures (see Figures 5-2 and 5-8 for non-islands, and 5-12 and 5-18 for islands), and because they have shown a limited sensitivity to islands (resulting in over-acceptance).

As for proficiency effects, an increase in proficiency levels leads to an increase in the rejection of gaps in islands. However, highly proficient L2ers are not sensitive to accepting RPs in islands and rejecting them in non-islands. Moreover, as proficiency increased, structures with gaps in non-islands were accepted more (see Figure 5-7), and islands with gaps were rejected more (see Figure 5-13 and 5-19). Proficiency also leads to reduced speed in processing of relative clauses.

These results are, again, consistent with the predictions of the Inhibition Hypothesis (De Cat et al., 2015), according to which false alarms (here: over-acceptance of RPs even at highly-proficient stages) persist, and even when misses have disappeared, but they have not yet in our learners. That is why Behdini L2ers over-accepted RPs even at advanced stages of proficiency despite accepting gaps in a native-like manner. This is conditioned by difficulties in inhibiting this prominent trait of the L1.

It was predicted that at lower proficiency levels, the tense of the clause might influence the acceptance of RPs. However, the effect of ergativity did not transfer into L2ers' interlanguage, and thus this hypothesis is refuted. However, the impact of tense on speed of processing suggests that the L2ers continue being influenced by the processing routines of the L1 even when the relevant distinctions are not grammaticalised in the L2. This shows that the L2 learners pay attention to cues relevant in their L1 when processing their L2.

The RT analysis, as shown in Figure 5-14, shows that native speakers and L2ers have processed non-islands faster than islands and, overall, native speakers have expectedly processed test items faster than the L2ers. Therefore, the hypothesis that islands will be processed more slowly in general, both by native speakers and by L2ers is confirmed. Also, overall, native speakers processed test items faster than the L2ers.

Native speakers processed gaps in non-islands faster than RPs. This is expected because gaps in non-islands in English are considered acceptable structures. They also processed RPs in islands quickly, but slightly more slowly than gaps. The significant effect of the interaction between rating and RT lies in the observation that with native speakers rating has negatively correlated with speed, i.e. what the participant judges to be grammatical has been faster to process.

As for Behdini speakers, unlike native speakers, they processed RPs in non-island conditions significantly faster than RPs in islands, while they have processed gaps in islands and non-islands almost equally and faster than RPs overall. This is because Behdini tolerates resumptives in non-islands and allows gaps in islands, and that is why it is perhaps less sensitive to the interaction of islands and RPs.

Overall, gaps are processed by natives and non-natives faster than RPs because they are empty categories and thus require less time to read (Beltrama & Xiang, 2013). On the other hand, this study has provided evidence that resumption has a processing facilitation effect. In island conditions, for instance, RPs usually received higher comprehensibility scores than gaps, showing that they partially remedy the processing disruption associated with syntactic violations. Such rescuing effects, however, were not detectable in licit dependencies, where resumption was always rated lower than, or at best equal to, the gapped counterparts. Moreover, such effects never went all the way to fix the syntactic violation: while better than gaps, RPs in islands never quite reached the ratings of gaps outside islands.

Behdini speakers processed gaps significantly more slowly than RPs, which makes sense as this structure corresponds to their L1 grammar. Native speakers processed gaps and RPs similarly with RPs slightly faster (see Figure 5-3).

Thus, as expected, in islands RPs facilitated processing; by native speakers as they partly alleviate island effects, and by non-native speakers for the same reason. In non-islands, on the other hand, RPs have hindered processing by native speakers due to ungrammaticality, but they facilitated processing by non-native speakers due to transfer.

Due to the transfer of L1 processing routines, Behdini speakers processed structures with RPs faster in comparison to structures with gaps in possessive structures (see Figure 5-3). This is because the grammar of Behdini speakers categorically allows RPs in possessive structures. However, they processed gaps faster than RPs in non-islands (see Figure 5-7), which means that they did not transfer this processing routine from L1. Thus, this hypothesis has been partially confirmed. Also, as mentioned above, the impact of tense on speed of processing (see Figure 5-10) suggests that the L2ers continue being influenced by the processing routines of the L1 even when the relevant distinctions are not grammaticalised in the L2.

L2 learners processed grammatical sentences faster than ungrammatical sentences just like native speakers (Figure 5-4). Therefore, the prediction that rating will negatively correlate with speed has come true as what the participants have judged grammatical was faster to process.

In the reaction time data analysis, native speakers expectedly processed gaps faster than RPs in relative non-islands but RPs faster than gaps in wh-clause non-islands. As for Behdini learners, they processed gaps faster than RPs in both non-island origin clauses (see Figure 5-8). As L2ers' proficiency increased, RPs were processed faster (see Figure 5-9).

Proficiency is observed to have an effect on processing ungrammatical sentences more slowly than grammatical sentences (see Figures 5-9, 5-16, and 5-21). These results do not only imply that the differences between native and non-native speakers are quantitative. The Variational Learning Hypothesis captures such differences as competition between grammars, i.e. representational (albeit driven by frequency patterns in the input). More proficient learners get more target-like in structures with gaps, so the grammar that licenses them is getting reinforced. The lack of improvement in the rejection of RPs can be captured by complementing the Variational Learning Hypothesis (Slabakova, 2008) with the Inhibition Hypothesis (De Cat et al., 2015), which explains such pattern of over-acceptance as a processing effect.

The above is compatible with an additional, quantitative difference between first and second language processing (cf. Roberts, 2013), as seen in RT differences. This is one of the clear effects that proficiency shows in this experiment.

Nonetheless, English is considered a foreign language in Kurdistan as it is learned in a setting where it is neither the official language nor the main medium of communication, nor even the medium of local media. And it is learned in a setting where another language (Kurdish) is spoken natively and English is only spoken for the purposes of communicating with foreigners. Adding to this, it is mainly learned in classroom, i.e. tutored rather than learned naturally.

The L2ers acquired gaps in non-islands, but they continue to accept RPs as in their L1. The conclusion that Behdini speakers acquired gaps is further captured from the processing analysis, as Behdini learners processed gaps faster than RPs. However, L2 speakers have shown a substantial amount of individual variation in the relative clauses data (see Figure 5-11). Along with the observation that Behdini learners over-accepted the RPs, but at the same time accepted gaps equally to the acceptance rate of native speakers, so it is possible that perhaps some L2 speakers have fully acquired the English system but others have not, due to the individual variation.

Finally, it is worth pointing out that the validity of this design could be controversial. Indeed, it is possible that participants did not fully process the meaning of the structures, as there was no comprehension question to ascertain that. It is possible that they processed the sentences somewhat superficially, just enough to provide a grammaticality judgment. This confusion will have to be accounted for in future research by having a separate JET and an on-line comprehension test, ideally.

5.4.4 Conclusion

This study of the use of gaps and resumptives in wh-dependencies in L2 grammars has allowed us to examine the assumptions brought by the generative approaches to SLA that UG constrains L1 and L2 acquisition, with the main issue of the initial state, which is assumed to be the grammar of L1 transferred to L2 acquisition hindering a full convergence onto the target system. Based on the timed sensitive self-paced reading task and the JET experiment, a number of conclusions can be drawn, which will be laid out below in light of the two research questions that guided the analysis.

Based on the main research questions of this study, the status of the interlanguage of Behdini learners of English intrusive pronouns is summarised below.

Due to the different parameter resetting between Behdini and English possessive structures, based on predictions of the Interpretability Hypothesis (Tsimpli & Dimitrakopoulou, 2006) resumptive uses of NP-internal or possessive structures in the L1 are, therefore, transferred as parametric options to the developing L2 grammar.

Transfer from L1 is still persistant In non-possessive structures. The relevant part of the grammar can be transferred with the probability weight of Behdini (i.e. as a variable option). This is, in fact, assumed in all cases: possessives, non- islands, and islands with different probability weights in each case (motivated by different factors). The effect of variability in Behdini on their acquisition of English accounts for the nature of L2ers' interlanguage allowing structures with both gaps and RPs (the Variational Learning Hypothesis, Slabakova, 2008).

It is also concluded that Behdini L2ers positively transferred the distribution of resumptive pronouns in island configurations. However, they were less sensitive to the interaction of islands and RPs as they over-accepted RPs both in islands and non-islands, and they also accepted gaps in islands more than they should. This interlanguage, therefore, does not feature intrusive pronouns (pronouns that are strictly used in islands), but rather it features resumptive pronouns which are used interchangeably with gaps whether inside or outside of island structures due to transfer from L1.

Proficiency had an effect on the judgement analysis in that its increase led to increase the acceptance of gaps in non-islands and rejection of gaps in islands. However, highly proficient L2ers did not show sensitivity to rejection of RPs and this is compatible with the Inhibition Hypothesis (De Cat et al., 2013).

As for effects of proficiency on processing, ungrammatical sentences were processed more slowly than grammatical sentences by highly proficient L2 speakers. The variational learning hypothesis captures such differences as competition between grammars, i.e. representational (albeit driven by frequency patterns in the input). More proficient learners get more target-like in structures with gaps, so the grammar that licenses them is getting reinforced. The lack of improvement in the rejection of RPs can be captured by complementing the Variational Learning Hypothesis (Slabakova, 2008) with the Inhibition Hypothesis (De Cat et al, 2015), which explains such pattern of over-acceptance as a processing effect. This is compatible with an additional, quantitative difference between first and second language processing (cf. Roberts, 2013), as seen in RT differences.

Thus, the results of this study confirmed the main hypothesis. The structures that are parametrically different between Behdini and English proved to be hard-to-process contexts for the L2ers, in which they could not reset the setting into L2. And because Behdini learners have applied their L1 knowledge of apparent resumption plus the effect of limited sensitivity to islands, their interlanguage shows the use of RPs, and that is why the error rate in the difficult-to-process structures was high.

However, it can be concluded that parameter resetting is not impossible, as there was an improvement in gapped structures. But at the proficiency levels we have studied, acquisition is far from complete.

On the other hand, Behdini learners responded correctly to some L2 structures that are not instantiated in their L1 such as gaps in possessives and other structures. This might be evidence for the existence of UG, and this is in line with the predictions of the Full Transfer Full Access Hypothesis (Schwartz & Sprouse, 1996).

However, the results are overall compatible with the Variational Learning Hypothesis (Slabakova, 2008) as the two grammars remain in competition in the L2 learners, allowing both wh-dependencies with gaps and anaphoric dependencies with RPs.

In conclusion, based on the behavioural and psycholinguistic data, it can be argued that Behdini learners have failed to inhibit the use of their L1 resumptives in most cases. However, they have succeeded in acquiring the overall correct English grammar regarding the distribution of gaps.

REFERENCES

ALEXOPOULOU, T. (2010). *Truly intrusive: resumptive pronominals in questions and relative clauses*. *Lingua,* 120**,** 485-505.

ALEXOPOULOU, T., and KELLER, F. (2007). Locality, cyclicity and resumption: At the interface between the grammar and the human sentence processor. Language 83: 110–160.

BAAYEN, R. H., JANDA, L. A., NESSET, T., DICKEY, S., ENDRESEN, A., MAKAROVA, A. (2013). Making choices in Russian: Pros and cons of statistical methods for rival forms.*Russian Linguistics* 37, 253-291 doi:10.1007/s11185-013-9118-6.

BAAYEN, R.H., FELDMAN, L.B. & SCHREUDER, R. (2006). Morphological influences on the recognition of monosyllabic monomorphemic words. *Journal of Memory and Language* 55: 290-313.

BELIKOVA, A., & WHITE, L. (2009). Evidence for the Fundamental Difference Hypothesis or not? Island constraints revisited. *Studies in Second Language Acquisition, 31*, 1–24.

BELTRAMA, A. (2013.) Intrusive but not intruders. The processing of resumptive pronouns in Italian and English. Penn Linguistics Colloquium 37 (PLC). Philadelphia, Pennsylvania.

BINDER, K. S. & RAYNER, K. (1998). Contextualstrength does not modulate the subordinate bias effect: Evidence from eye fixations and self-paced reading. *Psychonomic Bulletin & Review*. 1998,5 (2), 271-276.

BIRDSONG, D. & MOLIS, M. (2001). On the evidence for maturational constraints in second-language acquisition. *Journal of Memory and Language 44, 235-249. for second-language acquisition*. American Psychological Society 14, 31-38.

BLAKE, B. J. (1994). *Case*. Cambridge: Cambridge University Press.

BLEY-VROMAN, R. & MASTERSON, D. (1989). Reaction time as a supplement to grammaticality judgements in the investigation of second language learners' competence. University of Hawai'i Working Papers in ESL, Vol. 8, No. 2, pp. 207–237.

BLEY-VROMAN, R. (1989). What is the logical problem of foreign language learning? In S. Gass & J. Schachter (Eds.), *Linguistic perspectives on second language acquisition* (pp. 41–68). Cambridge: Cambridge University Press.

BLUMENFELD, H. K., & MARIAN, V. (2007). Constraints on parallel activation in bilingual spoken language processing: Examining proficiency and lexical status using eyetracking. *Language and Cognitive Processes*, *22*(5), 633-660.

BOZARSLAN, Z. (2003). *Zimanên ergatîv*. In *Mehname*. Vol. 45. Available at http://www.geocities.com/.

BUTT, M. and ASHWINI, D. (2003). “Ergativity in Indo-Aryan.” Stanford University. Available at http://www.cogsci.ed.ac.uk/.

C. DE CAT, E. KLEPOUSNIOTOU, and H. BAAYEN. (2015). Representational deficit or processing effect? an electrophysiological study of noun-noun compound processing by very advanced l2 speakers of English. Frontiers in Psychology, 6(77).

CARNIE, A. (2002). *Syntax: a generative introduction.* Oxford: Blackwell publishing.

CHOMSKY, N. (1964). *Degrees of grammaticalness*. *In* Fodor, J. A. and J. Katz, eds., *The Structure of Language: Readings in the Philosophy of Language*, pp. 384–389. Englewood Cliffs, NJ: Prentice-Hall.

CHOMSKY, N. (1965). *Aspects of the Theory of Syntax*. Cambridge, Massachusetts: MIT Press.

CHOMSKY, N. (1986). *Knowledge of language: Its nature, origin, and use*. New York: Praeger.

CHOMSKY, N. (2005). Three factors in language design. *Linguist.Inq.* 36, 1–22.doi: 10.1162/0024389052993655

CHOMSKY, N. (1973). "Conditions on Transformations." In *A Festschrift for Morris Halle*, ed. Anderson, Stephen and Paul Kiparsky, 232–286. New York: Holt, Rinehart, and Winston.

CLAHSEN H., FESLER C. (2006) How native-like is non-native language processing?. Trends in Cognitive Sciences 10: 564–570.

CLAHSEN, H., & FELSER, C. (2006). Grammatical processing in language learners. *Applied Psycholinguistics, 27*, 3–42.

CLAHSEN, H., M. PENKE, and T. PARODI. (1993/94). Functional categories in early child German. *Language Acquisition* 3: 395-429.

CLARK, A., & LAPPIN, S. (2011). Linguistic nativism and the poverty of the stimulus. Malden, MA: Wiley-Blackwell.

CLEARY, A. M., & LANGLEY, M. M. (2007). Retention of the structure underlying sentences. *Language and Cognitive Processes*, 22, 614–628.

CRYSMANN, B. (2010). Resumption and island-hood in Hausa. In Proceedings of the 15th Conference on Formal Grammar, Lecture Notes in Computer Science. Springer.

CRYSTAL, D. (1971). *Linguistics*. GB: Hazell Watson and Viney Ltd.

CRYSTAL, D. (1974). *What is linguistics*? 3rd ed. London: Edward Arnold Publishers Ltd.

CRYSTAL, D. (1991). *A dictionary of linguistics and phonetics*. 3rd ed. Oxford: Blackwell.

DE GRAAF, R. (1997). The experanto experiment: Effects of explicit instruction on second language acquisition. *Studies in Second Language Acquisition*, 19, 249-276.

DEKEYSER, R. M. (1995). Learning second language grammar rules: An experiment with a miniature linguistic system. *Studies in Second Language Acquisition*, 17, 379-410

DEKYDTSPOTTER, L. (2009) Second language epistemology, take two. *Studies in Second Language Acquisition*, *31*, 291–321.

DEKYDTSPOTTER, L., & MILLER, A.K. (2009). Probing for intermediate traces in the processing of long-distance *wh*-dependencies in English as a second language. In M. Bowles, T. Ionin, S. Montrul, & A. Tremblay (Eds.), *Proceedings of the 10th Generative Approaches to Second Language Acquisition Conference (GASLA 2009)* (pp. 113–124). Somerville, MA: Cascadilla Press.

DEKYDTSPOTTER, L., SCHWARTZ, B. D., & SPROUSE, R. A. (2006). The comparative fallacy in L2 pro- cessing research. In M. G. O'Brien, C. Shea, & J. Archibald (Eds.), *8th Generative Approaches to Second Language Acquisition Conference (GASLA 2006)* (pp. 33–40). Somerville, MA: Cascadilla Proceedings Project.

DELANCEY, S. (1980). *An interpretation of split ergativity and related patterns*.

DIXON, R. M. W. (1979). Ergativity. Language, 55:59-138.

DIXON, R. M. W. (1987). *Studies in ergativity*. In *Lingua*. 71, 1- 16.

DIXON, R. M. W. (1994). *Ergativity*. Cambridge: Cambridge University Press.

ELLIS, N. C. (2007). The weak-interface, consciousness, and form-focused instruction: Mind the Doors. In S. Fotos & H. Nassaji (Eds.), *Form-focused* *instruction and teacher education: Studies in honour of Rod Ellis* 17–33, Oxford: Oxford University Press.

ELLIS, R. (2005). Measuring implicit and explicit knowledge of a second language: A psychometric study. *Studies in Second Language Acquisition*, *27*, 141–172.

EPSTEIN, S., FLYNN, S., & MARTOHARDJONO, G. (1998). The strong continuity hypothesis: some evidence concerning functional categories in adult L2 acquisition. In S. Flynn, G. Martohardjono, & W. O'Neil (Eds.). *The generative study of second language acquisition*, (pp. 61-77). Mahwah, NJ: Lawrence Erlbaum.

EUBANK, L. (1994). Optionality and the initial state in L2 development. In Hoekstra, T. and Schwartz, B.D., editors, *Language acquisition studies in generative grammar.* Amsterdam: John Benjamins, 369–88.

FELSER, C., CUNNINGS, I., BATTERHAM, C. & CLAHSEN, H. (2012) The timing of island effects in nonnative sentence processing. Cambridge University Press. Studies in Second Language Acquisition 34, 67-98.

FERREIRA, F., and SWETS, B. (2005). The production and comprehension of resumptive pronouns in relative clause ‘‘island’’ contexts. In Twenty-first century psycholinguistics: Four cornerstones, ed. by Anne Cutler, 263–278. Mahwah, NJ: Lawrence Erlbaum.

FLEGE, J. (2009). Give input a chance! In T. Piske & M. Young-Scholten (Eds.), *Input matters in SLA* (pp. 175–190). Bristol: Multilingual Matters.

FLYNN, S. (1996). "A parameter-setting approach to second language acquisition", W.C. Ritchie & T.K. Bhatia (eds), *Handbook of Second Language Acquisition*, San Diego: Academic Press, 121-158.

FLYNN, S., & MARTOHARDJONO, G. (1994). Mapping from the Initial State to the Final State: The separation of universal principles and language specific properties. In B. Lust, M. Suñer, & J. Whitman (Eds.), *Syntactic theory and first language acquisition: crosslinguistic perspectives*, (pp. 319-336), Hillsdale, NJ: Lawrence Erlbaum.

FOTOS, S. (1993). Consciousness-raising and noticing through focus on form: Grammar task performance versus formal instruction. *Applied Linguistics*, 14, 385–407.

FRANCIS, A. P., SCHMIDT, G. L. CARR, T. H., & CLEGG, B. A. (2009). Incidental learning of abstract rules for non-dominant word orders. *Psychological Research, 73*, 60–74.

FRAZIER, L. (2013). A recycling approach to processing ellipsis. In L. Cheng and N. Corver (eds) *Diagnosis in Syntax*. Oxford University Press.

FRIEND, R. C. (1985). *Ergativity in Suleimaniye Kurdish*. Available at http://www.home.earthlink.net/.

FROMKIN, V. and RODMAN, R. (1983). *An Introduction to language*. Holt-Saunders International Editions.

GASS, S. & SELINKER, L. (2008). *Second language acquisition: An introductory course* (3rd edition). New York: Routledge.

GASS, S., and SELINKER, L. (1994). *Second Language Learning Data Analysis.* Hillsdale. New Jersey : Lawrence Erlbaum Associates.

GIBSON, EDWARD (2000). The dependency locality theory: A distance-based theory of linguistic complexity. In Alec Marantz, Yasushi Miyashita & Wayne O'Neil (eds.). *Image, language, and brain* (pp. 95-126). Cambridge, MA: MIT Press.

GÓMEZ, R. L. (2002). Variability and detection of invariant structure. *Psychological Science*, *13*(5), 431-436.

GREGG, K. R. (1993). Taking explanation seriously; or, let a couple of flowers bloom. *Applied Linguistics*, *14*(3), 276-294.

GUILLIOT, N., & MALKAWI, N. (2012). On covariation & competition: How resumptives distribute and covary. Handout from the Resumptive Pronouns Workshop.

HAIG, G. (2011). Linker, relativizer, nominalizer, tense-particle: On the Ezafe in West Iranian. *In:* YAP FOONG HA, K. G.-H., JANICK WRONA (ed.) *Nominalization in Asian Languages: Diachronic and typological perspectives.* Amsterdam/Philadelphia: Benjamins.

HAKUTA, K., BIALYSTOK E. & WILEY, E. (2003). Critical Evidence: A test of the critical-period hypothesis.

HAN, C., NOUREDDINE, E., CHRISTINA G., EMRAH, G., NANCY, H., JENNIFER, H., MEGHAN, J., KYEONG, M. K., and SUSANNAH, K. (2012). Processing strategies and resumptive pronouns in English. In Proceedings of the 30th West Coast Conference on Formal Linguistics (WCCFL 30), ed. Nathan Arnett and Ryan Bennett. Somerville, MA: Cascadilla Press.

HAN, Y., & ELLIS, R. (1998). Implicit knowledge, explicit knowledge and general language proficiency. *Language Teaching Research*, 21, 1–23.

HAVIK, E. et al. (2009). Processing Subject-Object Ambiguities in the L2: A Self-Paced Reading Study With German L2 Learners of Dutch. University of Michigan. *Language Learning* 59:1, March 2009, pp. 73–112 73.

HAWKINS, R. & CASILLAS, G. (2008). Explaining frequency of verb morphology in early L2 speech. *Lingua, 118,*595-612.

HAWKINS, R. & LISZKA, S. (2003). Locating the source of defective past tense marking in advanced L2 English speakers. In Roeland, V. H.; Aafke, H.; Folkert K.; & Richard T. (eds.), *The interface between syntax and lexicon in second language acquisition,* 21-44. Amsterdam: Benjamins.

HAWKINS, R. (2001). *Second language syntax: a generative introduction.* Malden (MA): Blackwell Publishing.

HAWKINS, R. (2011). Statistical learning and innate knowledge in the development of second language proficiency: evidence from the acquisition of gender concord. In A.G. Benati, (Ed.) *Issues in second language proficiency*. Clevedon: Multilingual Matters.

HAWKINS, R. and CHAN, C. (1997). The partial availability of universal grammar in second language acquisition: the ‘failed functional features hypothesis’. *Second Language Research* 13, 187–226.

HAWKINS, R., & CHAN, C. Y.-H. (1997). The partial availability of Universal Grammar in second language acquisition: The ‘failed functional features hypothesis.' *Second Language Research, 13*(3), 187–226.

HAWKINS, R., & HATTORI, H. (2006). Interpretation of English multiple *wh*-questions by Japanese speakers: A missing uninterpretable feature account. *Second Language Research, 22*, 269–301.

HAWKINS, R., TOWELL, R. and BAZERGUI, N. (1993). Universal grammar and the acquisition of French verb movement. *Second Language Research* 9, 189–233.

HAZDENAR, B. & SCHWARTZ, B. D. (1997). Are there optional infinitives in child L2 acquisition? In Elizabeth Hughes, Mary Hughes, & Annabel Greenhill (eds.), *Proceedings of the 21st Annual Boston University Conference on Language Development,* 257-268. Somerville, MA: Cascadilla Press.

HAZNEDAR, B. (2001). The acquisition of the IP system in child L2 English. *Studies in Second Language Acquisition* 23: 1-39.

HEESTAND, D., XIANG, M. and POLINSKY, M. (2011). Resumption still does not rescue islands. *Linguistic Inquiry* 42: 138- 152.

HIRAMATSU, K. (1999). Subject and adjunct island asymmetries: Evidence from syntactic situation. In S. Bird, A. Crnie, J. D. Haugen, and P. Norquest (eds.), *Proceedings of the West Coast Conference on Formal Linguistics* 18, pp. 183- 192. Somerville, MA: Cascadilla Press.

HIRAMATSU, K. (2000). Accessing linguistic competence: Evidence from children's and adults' acceptability judgements. Doctoral dissertation, University of Connecticut, Storrs.

HUGHES, M. & ALLEN, S.E.M. (2013). *The effect of discourse-pragmatic features on subject omission in English*. Journal of Pragmatics 56, 15-31.

HYLTENSTAM, K. (1984). The use of typological markedness conditions as predictors in second language acquisition: The case of pronominal copies in relative clauses. In R. Andersen (ed.) Second Languages: A cross-linguistic perspective, pp. 39-58. Rowley, Mass: Newbury House Publishers.

INDEFREY, P. (2006). It is time to work toward explicit processing models for native and second language speakers. *Applied Psycholinguistics, 27*(1), 66–69.

IONIN, T. and K. WEXLER. (2002). Why is ‘is’ easier than ‘-s’?: Acquisition of tense/agreement morphology by child second language learners of English. *Second Language Research* 18: 95-136.

IOUP, G., & KRUSE, A. (1977). Interference versus structural complexity in second language acquisition: Language universals as a basis for natural sequencing. In R.D. Brown, C.A. Yorio, & R.R. Crymes (Eds.), *On TESOL* 77: *Teaching and learning English as a second language: Trends in Research and Practice.* Washington, D.C.: TESOL.

JACKSON, C. N., & BOBB, S. C. (2009). The processing and comprehension of *wh*-questions among second language speakers of German. *Applied Psycholinguistics, 30*, 603–636.

JACKSON, C. N., & van HELL, J. G. (2011). The effects of L2 proficiency level on the processing of *wh*-questions among Dutch second language speakers of English. *International Review of Applied Linguistics, 49*, 195–219.

JIANG, N. (2012). *Conducting reaction time research in second language studies*. New York: Routledge.

JOHNSON, J. S. & NEWPORT, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21(1), 60- 99.

JUFFS, A. & RODRÍGUEZ, G. A. (2014). Second Language Sentence Processing. Routledge.

KARIMI D. G. (1997). *Light verb constructions in Persian*. Doctoral Dissertation, Essex University, England.

KEFFALA, B., and GOODALL, G. (2011). Do resumptive pronouns ever rescue illicit gaps in English? A poster presented at CUNY 2011 Conference on Human Sentence Processing, March 24-26, 2011, Stanford University

KELLER, F. (2000). Gradience in grammar: Experimental and computational aspects of degrees of grammaticality. Unpublished doctoral dissertation, University of Edinburgh.

KIM, B., & GOODALL, G. (2011). Age-related effects on constraints on *Wh*-movement. In J. Herschensohn & D. Tanner (Eds.), *Proceedings of the 11th Generative Approaches to Second Language Acquisition Conference (GASLA 2011)* (pp. 54–62). Somerville, MA: Cascadilla Proceedings Project.

KOORNNEEF, A. W. & VAN BERKUM, J. (2006). On the use of verb-based implicit causality in sentence comprehension: Evidence from self-paced reading and eye tracking. *Journal of Memory and Language* 54 (2006) 445–465.

KRASHEN, S. D. (1981). *Second language acquisition and second language learning.* Oxford: Pergamon Press.

KROCH, ANTHONY. (1981). On the role of resumptive pronouns in amnestying island constraint violations. In Proceedings of the 16th Chicago Linguistic Society (CLS 16), ed. Williams et al., 125–135. Somerville, MA: Cascadilla Press.Language 57, 627–657.

LARDIERE, D. (2003). Revisiting the comparative fallacy: a reply to Lakshmanan and Selinker, 2001. Second Language Research 19, 129–43.

LEAL MÉNDEZ, T., & SLABAKOVA, R. (2012). The Interpretability Hypothesis again: A partial replication of Tsimpli and Dimitrakopoulou (2007). *International Journal of Bilingualism.* DOI: 10.1177/1367006912448125.

LENNEBERG, E. H. (1976). *Biological foundations of language*. New York: Wiley.

LEWIS, R. L., & VASISHTH, S. (2005). An activation-based model of sentence processing as skilled memory retrieval. *Cognitive Science*, 29 , 375–419.

LIGHTBOWN, P. M. & SPADA, N. 2006. *How languages are learned*. (3rd edition) Oxford: Oxford University Press.

MACMILLAN, N., and CREELMAN, C. (2005). *Detection Theory: A User’s Guide*. Mahwah, NH: Lawrence Erlbaum Associates.

MARINIS, T. (2010). *Using on-line processing methods in language acquisition research*. In: UNSWORTH, S. & BLOM, E. (eds.). Experimental methods in language acquisition research. John Benjamins [Language Learning and Language Teaching 27], pp. 139- 162.

MARINIS, T., ROBERTS, L., FELSER, C., & CLAHSEN, H. (2005). Gaps in second language sentence processing. *Studies in Second Language Acquisition*, *27*, 53–78.

MATTHEWS, P. H. (1997). *The concise oxford dictionary of linguistics*. Oxford: Oxford University Press.

MCDONALD, JANET L. (2006). "Beyond the critical period: Processing-based explanations for poor grammaticality judgment performance by late second language learners." *Journal of Memory and Language*(55): 381–401.

MCELREE B., GRIFFITH T. (1998). Structural and lexical constraints on filling gaps during sentence comprehension: A time-course analysis. *Learn. Mem.* 24 432–460 10.1037//0278-7393.24.2.432.

MONTRUL, S. (2009). Re-examining the Fundamental Difference Hypothesis: What can early bilinguals tell us? *Studies in Second Language Acquisition, 31*(2), 225–257.

MONTRUL, S., & SLABAKOVA, R. (2003). Competence similarities between native and near-native speakers: An investigation of the preterite/imperfect contrast in Spanish. *Studies in Second Language Acquisition, 25*(3), 351–398.

MUHAMMAD, F. O. (2006). Ergativity in northern Kurdish with reference to English. University of Mosul. Unpublished MA Dissertation.

MUNOZ, C., & SINGLETON, D. (2011). A critical review of age-related research on L2 ultimate attainment. *Language Teaching, 33*(1), 1–35.

NEW, B., BRYSBAERT, M., VERONIS, J. & PALLIER, C. (2007). The use of film subtitles to estimate word frequencies. *Applied Psycholinguistics* 28: 661-677.

O'GRADY, W., ARCHIBALD, J., ARONOFF, M. and MILLER, J. (2005). *Contemporary linguistics*. 5th ed. USA: Bedford.

OMAKI, A., & SCHULTZ, B. (2011). Filler-gap dependencies and island constraints in second-language sentence processing. *Studies in Second Language Acquisition*, *33*, 563–588.

PABLOS, L. (2008) Filled-Gap Effects in Sentence Processing: different accounts compared, *ASJU, Anuario del Seminario de Filología Vasca Julio de Urquijo: International Journal of Basque Linguistics and Philology*, 42 (1), 309-332.

PALMER, F. (1971). *Grammar*. GB: Hazell Watson and Viney Ltd.

PENFIELD, W., & ROBERTS, L. (1959). *Speech and brain mechanisms*. Princeton, NJ: Princeton University Press.

PETER SELLS. (1984). Syntax and semantics of resumptive pronouns. PhD thesis, University of Massachusetts, Ahmerst.

PETERSON, D. J. (2005). *Notes on language creation*. Available at http://www.dedalvs.free.fr/.

PHILLIPS, C. (2006). The real-time status of island phenomena. *Language*, 82, 795-823.

PICKERING, M. J., & TRAXLER, M. J. (1996). *Plausibility and recovery from garden paths: An eye-tracking study.* Unpublished manuscript.

PLIATSIKAS, C., & MARINIS, T. (2012). Processing empty categories in a second language: When naturalistic exposure fills the (intermediate) gap. *Bilingualism: Language and Cognition,* articles in press.

POLINSKY M, CLEMENS LE, MORGAN AM, XIANG M, HEESTAND D. (2013). Resumption in English. In: Experimental syntax and Island effects, ed. Jon Sprouse. Cambridge University Press. pp. 341-360.

POLINSKY M, GOMEZ-GALLO C, GRAFF P, KRAVTCHENKO E. (2012). Subject preference and ergativity. Lingua.122(3):267-277.

POLINSKY, M., LAUREN E. C., ADAM M. M., MING X., and DAVID H. (2013). Resumption in english. In Experimental syntax and island effects, ed. Jon Sprouse, 341–360. Cambridge University Press.

PRÉVOST, P. and WHITE, L. (2000). Missing surface inflection or impairment in L2 acquisition? Evidence from tense and agreement. *Second Language Research* 16, 103–33.

PRINCE, E. F. (1999). How not to mark topics: ‘Topicalization’ in English and Yiddish. University of Pennsylvania.

QUITAF H. J. (2011). Relative clauses in Iraqi Arabic and the status of resumptive pronouns. MA thesis. Universitat Autònoma de Barcelona.

RADFORD, A. (1990). *Syntactic Theory and the Acquisition of English Syntax*. Oxford: Blackwell.

RADFORD, A., (2004). *English syntax: an introduction.* Cambridge: Cambridge University Press.

REBUSCHAT, P. (2008). *Implicit learning of natural language syntax*. Unpublished dissertation, University of Cambridge.

REBUSCHAT, P., & WILLIAMS, J. N. (2006). Dissociating implicit and explicit learning of natural language syntax. In R. Sun & N. Miyake (eds.), *Proceedings of the 28th Annual Conference of the Cognitive Science Society,* 2594. Mahwah, NJ: Erlbaum.

REBUSCHAT, P., & WILLIAMS, J. N. (2009). Implicit learning in second language acquisition. In C. A. Chapelle (ed.), *The encyclopedia of applied linguistics* (Vol. 20). Oxford: Wiley–Blackwell.

REINHART, T. (2006). *Interface Strategies*. MIT Press.

RICHARDS, J., PLATT, J. & PLATT, H. (eds). (1999).Longman Dictionary of Language Teaching and Applied Linguistics (3rd edn).Essex: Longman.

ROBERTS, L. (2013). *Sentence Processing.* van Gompel, R. P. G. (ed.). Hove: Psychology Press, 221-246 (*Current Issues in the Psychology of Language*).

ROBINSON, P. (1996). Learning simple and complex second language rules under implicit, incidental, rule-search and instructed conditions. *Studies in Second Language Acquisition*, 18, 27-67.

ROBINSON, P. (1997). Generalizability and automaticity of second language learning under implicit, incidental, enhanced and instructed conditions. *Studies in Second Language Acquisition*, 19, 223-247.

ROBINSON, P. (2005). Cognitive abilities, chunk-strength, and frequency effects in implicit artificial grammar and incidental L2 learning: Replications of Reber, Walkenfeld, & Hernstadt (1991) and Knowlton & Squire (1996) and their relevance for SLA. *Studies in Second Language Acquisition, 27*, 235–268.

ROUVERET, ALAIN ed. (2011). *Resumptive pronouns at the interfaces*. Amsterdam: John Benjamins.

SCHWARTZ, B. D., & SPROUSE, R. A. (1996). L2 cognitive states and the full transfer/full access model. *Second Language Research, 12*(1), 40–72.

SELINKER, L. (1972). Interlanguage. *IRAL-International Review of Applied Linguistics in Language Teaching*, *10*(1-4), 209-232.

SERVICE, E., SIMOLA, M., METSANHEIMO, O., & MAURY, S. (2002). Bilingual working memory span is affected by language skill. *European Journal of Cognitive Psychology, 14*, 383–408.

SIEGEL, L. (2004). *Ergativity and semantic bootstrapping*. Published Paper. University of Pennsylvania.

SLABAKOVA, R. (2003). Semantic Evidence for Functional Categories in Interlanguage Grammars. *Second Language Research,* 19(1): 42-75.

SLABAKOVA, R. (2006). Is there a Critical Period for the Acquisition of Semantics, special issue of *Second Language Research*, 22, 3, 302-338.

SLABAKOVA, R. (2008). Meaning in the Second Language, *Studies in Language Acquisition Series*, Berlin: Mouton de Gruyter.

SLABAKOVA, R. (2009). What Is Easy and What Is Hard to Acquire in a Second Language? In Proceedings of the 10th Generative Approaches to Second Language Acquisition Conference (GASLA 2009), ed. Melissa Bowles et al., 280-294. Somerville, MA: Cascadilla Proceedings Project.

SLABAKOVA, R. and J. GAJDOS. (2008). Variable morphology in L2 Acquisition: Facts and Explanations. In *Selected Proceedings from SLRF 2007*, Melissa Bowles, Rebecca Foote and Silvia Perpiñán (eds.), Cascadilla Proceedings Project.

SLABAKOVA, R. (2013) Adult second language acquisition: a selective overview with a focus on the learner linguistic system. *Linguistic Approaches to Bilingualism*, 3, (1), 48-72.

SLATER, K. (2004). *Phonological ergativity*. In *Specgram*. Vol. 147. Available at http://www.specgram.com/.

SMITH, N. and TSIMPLI, I.M. (1995). *The mind of a savant: language learning and modularity*. Oxford: Blackwell.

SORACE, A. (1999). Initial states, end-states and residual optionality in L2 acquisition. *Proceedings of the 23rd Boston University conference on language development*, 666–74.

SORACE, A. (2000). Syntactic optionality in non-native grammars. *Second Language Research* 16, 93–102.

SORACE, A. (2011). Pinning down the concept of "interface" in bilingualism. *Linguistic Approaches to Bilingualism, 1*(1), 1–34.

SPROUSE, J. (2007). Continuous acceptability, categorical grammaticality, and experimental syntax. Biolinguistics, 1, 123–134.

SWETS, B. et al. (2008). Underspecification of syntactic ambiguities: Evidence from self-paced reading. *Memory & Cognition*. 2008, 36 (1), 201-216. doi: 10.3758/MC.36.1.201.

TARALLO, F., and MYHILL, J. (1983). Interference and Natural Language Processing in Second Language Acquisition. *Language Learning 33.* 55-76.

TAVAKOLI, H. (2013). A dictionary of language acquisition: A comprehensive overview of key terms in first and second language acquisition. Tehran: Rahnama Press.

THACKSTON, W. M. (2006). *Kurmanji Kurdish. A reference grammar with selected readings*. Oxford: Oxford University Press.

TSIMPLI, I. M. (2006). Variation in SLA. In *Encyclopedia of language and linguistics* 2nd ed., 387-394. Oxford: Elsevier.

TSIMPLI, I. M., & DIMITRAKOPOULOU, M. (2007). The interpretability hypothesis: Evidence from wh-interrogatives in second language acquisition. *Second Language Research, 23*, 215–242.

TSIMPLI, I. M., & MASTROPAVLOU. M. (2007). Feature interpretability in L2 acquisition and SLI: Greek clitics and determiners. *The role of formal features in second language acquisition*, edited by H. Goodluck, J.Liceras & H.Zobl, 143-183. Routledge.

TSIMPLI, I.M. and ROUSSOU, A. (1991). Parameter-resetting in L2? *UCL Working Papers in Linguistics* 3, 149–70.

TSIMPLI, I.M., & DIMITRAKOPOULOU, M. (2008). The Interpretability Hypothesis: Evidence from wh-interrogatives in second language acquisition. *Second Language Research 23*, 215-242.

URA, H. (2000). *Checking theory and grammatical functions in universal grammar*. Oxford: Oxford University Press.

URA, H. (2006). *A parametric syntax of aspectually conditioned split-ergativity*. In Alana Johns, Diane Massam, and Juvenal Ndayiragije (Eds.). *Ergativity: emerging issues*. Dordrecht, Springer. 111-141.

VAN VALIN, R. D. JR. (2001). *An introduction to syntax*. Cambridge: Cambridge University Press.

VOGAL, R. (2005). *Degraded acceptability and markedness in syntax, and the stochastic interpretation of optimality theory*'. In Fanselow, Féry, Schlesewsky & Vogel (eds.) Gradience in Grammer, OUP, 2005, ROA-661.

WHEELER, M. (2003). *Alignment, case marking and indexation (agreement)*. In *Language theory*. Available at http://www.sussex.ac.uk/.

WHITE, L. (2003). *Second language acquisition and Universal Grammar*. Cambridge: University Press.

WILLIAMS, J. N. (2009). Implicit learning in second language acquisition. In W. C. Ritchie & T.K. Bhatia (eds.), *The new handbook of second language acquisition,* 319–353. Bingley: Emerald Press.

WILLIAMS, J. N., & KURIBARA, C. (2008). Comparing a nativist and emergentist approach to the initial stage of SLA: An investigation of Japanese scrambling. *Lingua,* 118, 522–553.

YANG, C. D. (2002). Knowledge and learning in natural language. Oxford: Oxford University Press.

APPENDICES

APPENDIX 1: Object omission in ergative and accusative sentences in Behdini

Who is meant to be seen in the following sentences? Choose the correct answer.

	Ew Him/her	Ewan Them	Tu You.S	Hwîn You.P	More than one person	Ungramm-atical
Min dît. I.OBL saw.3PS ‘I saw him.’	98%	-	-	-	2%	-
Me dît. We.OBL saw-3PS ‘We saw him.’	100%	-	-	-	-	-
Me dît-in. We.OBL saw-3PP ‘We saw them.’	6%	94%	-	-	-	-
Min dît-in. I.OBL saw-3PP ‘I saw them.’	10%	90%	-	-	-	-
Min dît-î. I.OBL saw-2PS ‘I saw you.’	-	-	10%	-	5%	85%
Min dît-in. I.OBL saw-2PP ‘I saw you(P).’	-	-	-	-	6%	94%
Ez di-bîn-im. I.ACC see-1PS ‘I see.’	-	-	-	5%	91%	4%
Tu di-bîn-î. You.ACC see-2PS ‘You see.’	-	-	-	-	80%	20%
Ew di-bîn-ît. He.ACC see-3PS ‘He sees.’	-	-	-	-	86%	14%
Ew di-bîn-in. They.ACC see-3PP ‘They see.’	-	-	-	-	100%	-
Em di-bîn-în. We.ACC see-1PP ‘We see.’	-	-	-	-	95%	5%

Appendix 2: The form of the JET of the first study with the full materials.

Age:

Sex: (Male – Female)

Mother tongue:

Other languages spoken:

Current usage of English: (daily – a few times a week – a few times a month – rarely – not at all).

GRAMMATICALITY JUDGEMENT

You are about to read a number of individual sentences. For each sentence, you need to indicate whether you could say the sentence exactly as it is **(option A)**; or if you think the sentence is fine but complicated to understand **(option B)**; or if you think you could say this sentence but in a particular context **(option C)**; or if you don't think anybody could say this sentence **(option D)**. Just write A, B, C, or D in the box that corresponds to the best option in your own judgement (only ONE choice is allowed per sentence). Do not think too long about each sentence: just follow your intuition. This is a survey about your OWN opinion.

A: I could say this sentence exactly as it is.

B: This sentence is fine but complicated to understand.

C: I could say this sentence in a particular context.

D: I don't think anybody could say this sentence.

Text items	**Grammatical role**	**Chain foot**	**Argument structure**	**Island**	**Movement type**	**Origin clause**	**Mother sentence**	**C**
Non-island configurations								
This is the man that loved your neighbour.	Subject	Gap	Ergative	No	Relative		22	2
This is the girl that married the governor.	Subject	Gap	Ergative	No	Relative		19	2
These are the persons that saved the kid.	Subject	Gap	Ergative	No	Relative		10	2
This is the doctor that treats you.	Subject	Gap	Ergative	No	Relative		16	2
This is the man that will love your neighbour.	Subject	Gap	Accusative	No	Relative		22	2
This is the girl that will marry the governor.	Subject	Gap	Accusative	No	Relative		19	2

These are the persons that will save the kid.	Subject	Gap	Accusative	No	Relative		10	2
This is the doctor that treats you.	Subject	Gap	Accusative	No	Relative		16	2
This is the man that he loved your neighbour.	Subject	RP	Ergative	No	Relative		22	2
This is the girl that she married the governor.	Subject	RP	Ergative	No	Relative		19	2
These are the persons that they saved the kid.	Subject	RP	Ergative	No	Relative		10	2
This is the doctor that he treats you.	Subject	RP	Ergative	No	Relative		16	2
This is the man that he will love your neighbour.	Subject	RP	Accusative	No	Relative		22	2
This is the girl that she will marry the governor.	Subject	RP	Accusative	No	Relative		19	2
These are the persons that they will save the kid.	Subject	RP	Accusative	No	Relative		10	2
This is the doctor that he treats you.	Subject	RP	Accusative	No	Relative		16	2
This is the car that my brother sold.	Object	Gap	Ergative	No	Relative		12	2
This is the man that I saw.	Object	Gap	Ergative	No	Relative		23	2
This is the girl that Ali married.	Object	Gap	Ergative	No	Relative		17	2
These are the houses that I burnt.	Object	Gap	Ergative	No	Relative		7	2
This is the car that my brother will sell.	Object	Gap	Accusative	No	Relative		12	2
This is the man that I see.	Object	Gap	Accusative	No	Relative		23	2
This is the girl that Ali will marry.	Object	Gap	Accusative	No	Relative		17	2
These are the houses that I will burn.	Object	Gap	Accusative	No	Relative		7	2
This is the car that my brother sold it.	Object	RP	Ergative	No	Relative		12	2
This is the man that I saw him.	Object	RP	Ergative	No	Relative		23	2
This is the girl that Ali married her.	Object	RP	Ergative	No	Relative		17	2
These are the houses that I burnt them.	Object	RP	Ergative	No	Relative		7	2
This is the car that my brother will sell it.	Object	RP	Accusative	No	Relative		12	2
This is the man that I see him.	Object	RP	Accusative	No	Relative		23	2
This is the girl that Ali will marry her.	Object	RP	Accusative	No	Relative		17	2
These are the houses that I will burn them.	Object	RP	Accusative	No	Relative		7	2
This is the man that I saw the wife of.	Possessive	Gap	Ergative	No	Relative		24	2
This is the girl that you saw the mobile of.	Possessive	Gap	Ergative	No	Relative		20	2
These are the houses that I repaired the doors of.	Possessive	Gap	Ergative	No	Relative		6	2
This is the car that you sold the engine of.	Possessive	Gap	Ergative	No	Relative		14	2
This is the man that I see the wife of.	Possessive	Gap	Accusative	No	Relative		24	2
This is the girl that you see the mobile of.	Possessive	Gap	Accusative	No	Relative		20	2

These are the houses that I repair the doors of.	Possessive	Gap	Accusative	No	Relative		6	2
This is the car that you will sell the engine of.	Possessive	Gap	Accusative	No	Relative		14	2
This is the man that I saw the wife of him.	Possessive	RP	Ergative	No	Relative		24	2
This is the girl that you saw the mobile of her.	Possessive	RP	Ergative	No	Relative		20	2
These are the houses that I repaired the doors of them.	Possessive	RP	Ergative	No	Relative		6	2
This is the car that you sold the engine of it.	Possessive	RP	Ergative	No	Relative		14	2
This is the man that I see the wife of him.	Possessive	RP	Accusative	No	Relative		24	2
This is the girl that you see the mobile of her.	Possessive	RP	Accusative	No	Relative		20	2
These are the houses that I repair the doors of them.	Possessive	RP	Accusative	No	Relative		6	2
This is the car that you will sell the engine of it.	Possessive	RP	Accusative	No	Relative		14	2
This is the man that I talked with.	Oblique	Gap	Ergative	No	Relative		25	2
This is the girl that I walked with.	Oblique	Gap	Ergative	No	Relative		18	2
These are the people that I worked against.	Oblique	Gap	Ergative	No	Relative		9	2
This is the lawyer that I worked for.	Oblique	Gap	Ergative	No	Relative		21	2
This is the man that I talk with.	Oblique	Gap	Accusative	No	Relative		25	2
This is the girl that I walk with.	Oblique	Gap	Accusative	No	Relative		18	2
These are the people that I work against.	Oblique	Gap	Accusative	No	Relative		9	2
This is the lawyer that I work for.	Oblique	Gap	Accusative	No	Relative		21	2
This is the man that I talked with him.	Oblique	RP	Ergative	No	Relative		25	2
This is the girl that I walked with her.	Oblique	RP	Ergative	No	Relative		18	2
These are the people that I worked against them.	Oblique	RP	Ergative	No	Relative		9	2
This is the lawyer that I worked for him.	Oblique	RP	Ergative	No	Relative		21	2
This is the man that I talk with him.	Oblique	RP	Accusative	No	Relative		25	2
This is the girl that I walk with her.	Oblique	RP	Accusative	No	Relative		18	2
These are the people that I work against them.	Oblique	RP	Accusative	No	Relative		9	2
This is the lawyer that I work for him.	Oblique	RP	Accusative	No	Relative		21	2
This novel that you thought the teacher said we should have read was written by a female writer.	Object	Gap	Ergative	No	Long wh-q		28	3
The teacher whom you thought John said I talked to lives in London.	Object	Gap	Ergative	No	Long wh-q		5	4
This was the book that Ms. Brown said everybody had to return by Monday.	Object	Gap	Ergative	No	Long wh-q		11	3
The house that you said your brother has heard that I liked has been sold yesterday.	Object	Gap	Ergative	No	Long wh-q		4	4
This novel that you thought the teacher said we should have read it was written by a female	Object	RP	Ergative	No	Long wh-q		28	3

writer.								
The teacher whom you thought John said I talked to her lives in London.	Object	RP	Ergative	No	Long wh-q		5	4
This was the book that Ms. Brown said everybody had to return it by Monday.	Object	RP	Ergative	No	Long wh-q		11	3
The house that you said your brother has heard that I liked it has been sold yesterday.	Object	RP	Ergative	No	Long wh-q		4	4
This novel that you think the teacher says we should read is written by a female writer.	Object	Gap	Accusative	No	Long wh-q		28	3
The teacher whom you think John says I talked to lives in London.	Object	Gap	Accusative	No	Long wh-q		5	4
This is the book that Ms. Brown says everybody has to return by Monday.	Object	Gap	Accusative	No	Long wh-q		11	3
The house that you say your brother has heard that I like has been sold yesterday.	Object	Gap	Accusative	No	Long wh-q		4	4
This novel that you think the teacher says we should read it is written by a female writer.	Object	RP	Accusative	No	Long wh-q		28	3
The teacher whom you think John says I talked to her lives in London.	Object	RP	Accusative	No	Long wh-q		5	4
This is the book that Ms. Brown says everybody has to return it by Monday.	Object	RP	Accusative	No	Long wh-q		11	3
The house that you say your brother has heard that I like it has been sold yesterday.	Object	RP	Accusative	No	Long wh-q		4	4
Island configurations								
These are the jewels that I knew the man who sent to my mother.	Object	Gap	Ergative	Yes	Relative	Relative	8	3
This is the man that the policeman who arrested saved the president's life.	Object	Gap	Ergative	Yes	Relative	Relative	26	3
It is these shoes that I know the person who gifted to you.	Object	Gap	Ergative	Yes	Relative	Relative	2	3
These are the jewels that I knew the man who send to my mother.	Object	Gap	Accusative	Yes	Relative	Relative	8	3
This is the man that the policeman who arrests saves the president's life.	Object	Gap	Accusative	Yes	Relative	Relative	26	3
It is these shoes that I know the person who gifts to you.	Object	Gap	Accusative	Yes	Relative	Relative	2	3
These are the jewels that I knew the man who sent them to my mother.	Object	RP	Ergative	Yes	Relative	Relative	8	3
This is the man that the policeman who arrested him saved the president's life.	Object	RP	Ergative	Yes	Relative	Relative	26	3
It is these shoes that I know the person who gifted them to you.	Object	RP	Ergative	Yes	Relative	Relative	2	3
These are the jewels that I knew the man who send them to my mother.	Object	RP	Accusative	Yes	Relative	Relative	8	3
This is the man that the policeman who arrests him saves the president's life.	Object	RP	Accusative	Yes	Relative	Relative	26	3

It is these shoes that I know the person who gifts them to you.	Object	RP	Accusative	Yes	Relative	Relative	2	3
This is the defendant that you were surprised when you learnt that they sent to jail.	Object	Gap	Ergative	Yes	Relative	Adjunct	15	3
I interviewed the candidate that most people were disappointed because people voted for.	Object	Gap	Ergative	Yes	Relative	Adjunct	1	3
Which student were you furious because the principal expelled?	Object	Gap	Ergative	Yes	Relative	Adjunct	32	2
This is the movie that I said whenever you saw you would not be bored.	Object	Gap	Ergative	Yes	Relative	Adjunct	27	3
This is the defendant that you will be surprised if you learn that they will send to jail.	Object	Gap	Accusative	Yes	Relative	Adjunct	15	3
I will interview the candidate that most people will be disappointed if people vote for.	Object	Gap	Accusative	Yes	Relative	Adjunct	1	3
Which student will you be furious if the principal would expel?	Object	Gap	Accusative	Yes	Relative	Adjunct	32	2
This is the movie that I say whenever you see you will not be bored.	Object	Gap	Accusative	Yes	Relative	Adjunct	27	3
This is the defendant that you were surprised when you learnt that they sent her to jail.	Object	RP	Ergative	Yes	Relative	Adjunct	15	3
I interviewed the candidate that most people were disappointed because people voted for him.	Object	RP	Ergative	Yes	Relative	Adjunct	1	3
Which student were you furious because the principal expelled him?	Object	RP	Ergative	Yes	Relative	Adjunct	32	2
This is the movie that I said whenever you saw it you would not be bored.	Object	RP	Ergative	Yes	Relative	Adjunct	27	3
This is the defendant that you will be surprised if you learn that they will send her to jail.	Object	RP	Accusative	Yes	Relative	Adjunct	15	3
I will interview the candidate that most people will be disappointed if people vote for him.	Object	RP	Accusative	Yes	Relative	Adjunct	1	3
Which student will you be furious if the principal would expel him?	Object	RP	Accusative	Yes	Relative	Adjunct	32	2
This is the movie that I say whenever you see it you will not be bored.	Object	RP	Accusative	Yes	Relative	Adjunct	27	3
That is the girl that Peter said that how much Lars loved would determine the final decision.	Object	Gap	Ergative	Yes	Relative	Sententi al subject	3	4
Who did you think that to nominate would be a disaster?	Object	Gap	Ergative	Yes	Relative	Sententi al subject	34	3
This is the car that whatever money you would have offered would for not be enough.	Object	Gap	Ergative	Yes	Relative	Sententi al subject	13	3
That is the girl that Peter says that how much Lars loves will determine the final decision	Object	Gap	Accusative	Yes	Relative	Sententi al subject	3	4
Who do you think that to nominate would be a disaster?	Object	Gap	Accusative	Yes	Relative	Sententi al subject	34	3

This is the car that whatever money you would offer for will not be enough.	Object	Gap	Accusative	Yes	Relative	Sententi al subject	13	3
That is the girl that Peter said that how much Lars loved her would determine the final decision.	Object	RP	Ergative	Yes	Relative	Sententi al subject	3	4
Who did you think that to nominate him would be a disaster?	Object	RP	Ergative	Yes	Relative	Sententi al subject	34	3
This is the car that whatever money you would have offered for it would not be enough.	Object	RP	Ergative	Yes	Relative	Sententi al subject	13	3
That is the girl that Peter says that how much Lars loves her will determine the final decision	Object	RP	Accusative	Yes	Relative	Sententi al subject	3	4
Who do you think that to nominate him would be a disaster?	Object	RP	Accusative	Yes	Relative	Sententi al subject	34	3
This is the car that whatever money you would offer for it will not be enough.	Object	RP	Accusative	Yes	Relative	Sententi al subject	13	3
Which dog did you know who bought illegally?	Object	Gap	Ergative	Yes	Long wh-q	Wh- island	31	2
Which building did you see who was targeting?	Object	Gap	Ergative	Yes	Long wh-q	Wh- island	30	2
Who did Layla see what the government gave?	Object	Gap	Ergative	Yes	Long wh-q	Wh- island	33	2
Which dog do you know who buys illegally?	Object	Gap	Accusative	Yes	Long wh-q	Wh- island	31	2
Which building have you seen who was targeting?	Object	Gap	Accusative	Yes	Long wh-q	Wh- island	30	2
Who does Layla see what the government gave?	Object	Gap	Accusative	Yes	Long wh-q	Wh- island	33	2
Which dog did you know who bought it illegally?	Object	RP	Ergative	Yes	Long wh-q	Wh- island	31	2
Which building did you see who was targeting it?	Object	RP	Ergative	Yes	Long wh-q	Wh- island	30	2
Who did Layla see what the government gave him?	Object	RP	Ergative	Yes	Long wh-q	Wh- island	33	2
Which dog do you know who buys it illegally?	Object	RP	Accusative	Yes	Long wh-q	Wh- island	31	2
Which building have you seen who was targeting it?	Object	RP	Accusative	Yes	Long wh-q	Wh- island	30	2
Who does Layla see what the government gave him?	Object	RP	Accusative	Yes	Long wh-q	Wh- island	33	2

Appendix 3: Distribution of test items in the relative clauses subset of data

Relative clauses	Sentences	Grammatical role
	This is the man that I see the wife of him. This is the man that I saw the wife of him. This is the man that I see the wife of. This is the man that I saw the wife of.	Possessive
	This is the girl that you see the mobile of her. This is the girl that you saw the mobile of her. This is the girl that you see the mobile of. This is the girl that you saw the mobile of.	
	These are the houses that I repair the doors of them. These are the houses that I repaired the doors of them. These are the houses that I repair the doors of. These are the houses that I repaired the doors of.	
	This is the car that you will sell the engine of it. This is the car that you sold the engine of it. This is the car that you will sell the engine of. This is the car that you sold the engine of.	
	This is the man that I talk with him. This is the man that I talked with him. This is the man that I talk with. This is the man that I talked with.	Oblique
	This is the girl that I walk with her. This is the girl that I walked with her.	

	This is the girl that I walk with. This is the girl that I walked with.	
	These are the people that I work against them. These are the people that I worked against them. These are the people that I work against. These are the people that I worked against.	
	This is the lawyer that I work for him. This is the lawyer that I worked for him. This is the lawyer that I work for. This is the lawyer that I worked for.	
	This is the man that he will love your neighbour. This is the man that he loved your neighbour. This is the man that will love your neighbour. This is the man that loved your neighbour.	Subject
	This is the girl that she will marry the governor. This is the girl that she married the governor. This is the girl that will marry the governor. This is the girl that married the governor.	
	These are the persons that they will save the kid. These are the persons that they saved the kid. These are the persons that will save the kid. These are the persons that saved the kid.	
	This is the doctor that he treats you. This is the doctor that he treats you. This is the doctor that treats you.	

	This is the doctor that treats you.	
	This is the car that my brother will sell it. This is the car that my brother sold it. This is the car that my brother will sell. This is the car that my brother sold.	Object
	This is the man that I see him. This is the man that I saw him. This is the man that I see. This is the man that I saw.	
	This is the girl that Ali will marry her. This is the girl that Ali married her. This is the girl that Ali will marry. This is the girl that Ali married.	
	These are the houses that I will burn them. These are the houses that I burnt them. These are the houses that I will burn. These are the houses that I burnt.	
Island relative clauses	- These are the jewels that I knew the man who send them to my mother. - These are the jewels that I knew the man who sent them to my mother. - These are the jewels that I knew the man who send to my mother. - These are the jewels that I knew the man who sent to my mother.	Object – Relative Islands
	- This is the man that the policeman who arrests him saves the president's life. - This is the man that the policeman who arrested him	

	saved the president's life. - This is the man that the policeman who arrests saves the president's life. - This is the man that the policeman who arrested saved the president's life.	
	- It is these shoes that I know the person who gifts them to you. - It is these shoes that I know the person who gifted them to you. - It is these shoes that I know the person who gifts to you. - It is these shoes that I know the person who gifted to you.	
	- This is the defendant that you will be surprised if you learn that they will send her to jail. - This is the defendant that you were surprised when you learnt that they sent her to jail. - This is the defendant that you will be surprised if you learn that they will send to jail. - This is the defendant that you were surprised when you learnt that they sent to jail.	Object – Adjunct Islands
	- I will interview the candidate that most people will be disappointed if people vote for him. - I interviewed the candidate that most people were disappointed because people voted for him. - I will interview the candidate that most people will be disappointed if people vote for. - I interviewed the candidate that most people were disappointed because people voted for.	
	- Which student will you be furious if the principal would expel him? - Which student were you furious because the principal expelled him?	

	- Which student will you be furious if the principal would expel? - Which student were you furious because the principal expelled?	
	- This is the movie that I say whenever you see it you will not be bored. - This is the movie that I said whenever you saw it you would not be bored. - This is the movie that I say whenever you see you will not be bored. - This is the movie that I said whenever you saw you would not be bored.	
	- That is the girl that Peter says that how much Lars loves her will determine the final decision. - That is the girl that Peter said that how much Lars loved her would determine the final decision. - That is the girl that Peter says that how much Lars loves will determine the final decision. - That is the girl that Peter said that how much Lars loved would determine the final decision.	Object – Sentential Subject Islands
	- Who do you think that to nominate him would be a disaster? - Who did you think that to nominate him would be a disaster? - Who do you think that to nominate would be a disaster? - Who did you think that to nominate would be a disaster?	
	- This is the car that whatever money you would offer for it will not be enough. - This is the car that whatever money you would have offered for it would not be enough. - This is the car that whatever money you would offer for will	

	not be enough. - This is the car that whatever money you would have offered would for not be enough.	

Appendix 4: Distribution of test items in the non-islands subset of data

Movement type	Sentences	Grammatical role
Relative clauses	This is the man that I see the wife of him. This is the man that I saw the wife of him. This is the man that I see the wife of. This is the man that I saw the wife of.	Possessive
	This is the girl that you see the mobile of her. This is the girl that you saw the mobile of her. This is the girl that you see the mobile of. This is the girl that you saw the mobile of.	
	These are the houses that I repair the doors of them. These are the houses that I repaired the doors of them. These are the houses that I repair the doors of. These are the houses that I repaired the doors of.	
	This is the car that you will sell the engine of it. This is the car that you sold the engine of it. This is the car that you will sell the engine of. This is the car that you sold the engine of.	
	This is the man that I talk with him. This is the man that I talked with him.	Oblique

	This is the man that I talk with. This is the man that I talked with.	
	This is the girl that I walk with her. This is the girl that I walked with her. This is the girl that I walk with. This is the girl that I walked with.	
	These are the people that I work against them. These are the people that I worked against them. These are the people that I work against. These are the people that I worked against.	
	This is the lawyer that I work for him. This is the lawyer that I worked for him. This is the lawyer that I work for. This is the lawyer that I worked for.	
	This is the man that he will love your neighbour. This is the man that he loved your neighbour. This is the man that will love your neighbour. This is the man that loved your neighbour.	Subject
	This is the girl that she will marry the governor. This is the girl that she married the governor. This is the girl that will marry the governor. This is the girl that married the governor.	
	These are the persons that they will save the kid. These are the persons that they saved the kid. These are the persons that will save the kid.	

	These are the persons that saved the kid.	
	This is the doctor that he treats you. This is the doctor that he treats you. This is the doctor that treats you. This is the doctor that treats you.	
	This is the car that my brother will sell it. This is the car that my brother sold it. This is the car that my brother will sell. This is the car that my brother sold.	Object
	This is the man that I see him. This is the man that I saw him. This is the man that I see. This is the man that I saw.	
	This is the girl that Ali will marry her. This is the girl that Ali married her. This is the girl that Ali will marry. This is the girl that Ali married.	
	These are the houses that I will burn them. These are the houses that I burnt them. These are the houses that I will burn. These are the houses that I burnt.	
Lon wh- questions	- This novel that you think the teacher says we should read it is written by a female writer. - This novel that you thought the teacher said we should have read it was written by a female writer. - This novel that you think the teacher says we should read	

	is written by a female writer. - This novel that you thought the teacher said we should have read was written by a female writer.	
	- The teacher whom you think John says I talked to her lives in London. - The teacher whom you thought John said I talked to her lives in London. - The teacher whom you think John says I talked to lives in London. - The teacher whom you thought John said I talked to lives in London.	
	- This is the book that Ms. Brown says everybody has to return it by Monday. - This was the book that Ms. Brown said everybody had to return it by Monday. - This is the book that Ms. Brown says everybody has to return by Monday. - This was the book that Ms. Brown said everybody had to return by Monday.	
	- The house that you say your brother has heard that I like it has been sold yesterday. - The house that you said your brother has heard that I liked it has been sold yesterday. - The house that you say your brother has heard that I like has been sold yesterday. - The house that you said your brother has heard that I liked has been sold yesterday.	

Appendix 5: Distribution of test items in the islands subset of data

Movement type	Sentences	Origin clause
Relative Clauses	- These are the jewels that I knew the man who send them to my mother. - These are the jewels that I knew the man who sent them to my mother. - These are the jewels that I knew the man who send to my mother. - These are the jewels that I knew the man who sent to my mother.	Relative Islands
	- This is the man that the policeman who arrests him saves the president's life. - This is the man that the policeman who arrested him saved the president's life. - This is the man that the policeman who arrests saves the president's life. - This is the man that the policeman who arrested saved the president's life.	
	- It is these shoes that I know the person who gifts them to you. - It is these shoes that I know the person who gifted them to you. - It is these shoes that I know the person who gifts to you. - It is these shoes that I know the person who gifted to you.	
	- This is the defendant that you will be surprised if you learn that they will send her to jail. - This is the defendant that you were surprised when you learnt that they sent her to jail. - This is the defendant that you will be surprised if you learn that they will send to jail.	Adjunct Islands

	- This is the defendant that you were surprised when you learnt that they sent to jail.	
	- I will interview the candidate that most people will be disappointed if people vote for him. - I interviewed the candidate that most people were disappointed because people voted for him. - I will interview the candidate that most people will be disappointed if people vote for. - I interviewed the candidate that most people were disappointed because people voted for.	
	- Which student will you be furious if the principal would expel him? - Which student were you furious because the principal expelled him? - Which student will you be furious if the principal would expel? - Which student were you furious because the principal expelled?	
	- This is the movie that I say whenever you see it you will not be bored. - This is the movie that I said whenever you saw it you would not be bored. - This is the movie that I say whenever you see you will not be bored. - This is the movie that I said whenever you saw you would not be bored.	
	- That is the girl that Peter says that how much Lars loves her will determine the final decision. - That is the girl that Peter said that how much Lars loved her would determine the final decision. - That is the girl that Peter says that how much Lars loves will determine the final decision.	Sentential Subject Islands

	- That is the girl that Peter said that how much Lars loved would determine the final decision.	
	- Who do you think that to nominate him would be a disaster? - Who did you think that to nominate him would be a disaster? - Who do you think that to nominate would be a disaster? - Who did you think that to nominate would be a disaster?	
	- This is the car that whatever money you would offer for it will not be enough. - This is the car that whatever money you would have offered for it would not be enough. - This is the car that whatever money you would offer for will not be enough. - This is the car that whatever money you would have offered would for not be enough.	
Long wh-questions	Which dog do you know who buys it illegally? Which dog did you know who bought it illegally? Which dog do you know who buys illegally? Which dog did you know who bought illegally	Wh-islands
	Which building have you seen who was targeting it? Which building did you see who was targeting it? Which building have you seen who was targeting? Which building did you see who was targeting?	
	Who does Layla see what the government gave him? Who did Layla see what the government gave him? Who does Layla see what the government gave? Who did Layla see what the government gave?	

Appendix 6: GRAMMATICALITY AND COREFERENCE (BINDING)

Read the following sentences carefully. Afterwards, you need to say how you interpret the underlined word in the sentences below, by selecting **all** the options that you consider correct (i.e. you can choose more than one per sentence).

A: I can interpret the underlined word as (one of the mentioned words “A”).

B: I can interpret the underlined word as (one of the mentioned words “B”).

C: I can interpret the underlined word as somebody not mentioned in the sentence.

D: I don't think anybody could say this sentence.

Sentences	Behdini				English			
	A	B	C	D	A	B	C	D
(1) Kîj lûrî çi şofêr bawer na-ket dê wî gehînîte derveyi welatî? Which truck no driver believing NEG-make will him reach across country Which truck does no driver believe it will get him across the country?	No driver 90% 9	Truck 0% 0	10% 1	10% 1	No driver 80% 8	Truck 0% 0	50% 5	70% 7
(2) Her kiç, Kerîmî gut ku ew dê serkevît. Every girl Karim say.PAST Comp she will pass Every girl, Karim said that she will pass.	Evry girl 100% 10	Karim 0% 0	0% 0	10% 1	Evry girl 80% 8	Karim 0% 0	10% 1	80% 8
(3) Kij pirtûk tu dibêjî tu hez nakiy ew bixwînî? Which book you say you liking NEG-make it read Which book you say you don’t like to read it?	Which book 90% 9	You 0% 0	10% 10 1	0% 0	Which book 40% 4	You 0% 0	50% 5	70% 7
(4) Her mirov, to tore buyî çunkî ew çû bê ku bêjît bixatirate. Every man you upset became because he went without Comp say goodbye Every man, you were upset because he went without saying goodbye.	Every man 90% 9	you 0% 0	10% 1	0% 0	Every man 80% 8	You 0% 0	10% 1	90% 9
(5) Her gumanbar, te divêt bizanî kî wê desteser kir. Every suspect you PRST-want know who her imprisoning do.PAST Every suspect, you want to know who imprisoned her.	Every suspect 100% 10	you 0% 0	10% 1	10% 1	Every suspect 80% 8	You 0% 0	40% 4	90% 9
(6) Her gumanbar, te divêt bizanî kî hizir diket ku ew revî. Every suspect you PRST-want know who thinking PRST-do Comp she ran away Every suspect, you want to know who thinks that she ran away.	Every suspect 100% 10	you 0% 0	20% 2	10% 1	Every suspect 50% 5	you 0% 0	40% 4	80% 8

(7) Her gumanbar, tu dizanî ku ew ya zîndanî bû. Every suspect you PRST-know Comp she EZ.F imprisoned was Every suspect, you know that she was imprisoned.	Every suspect 80% 8	you 0% 0	10% 1	0% 0	Every suspect 60% 6	you 0% 0	10% 1	100% 10
(8) Her filim, min got tu dê xoşî bi dîtina wî bey pitir ji carekî. Every movie I say.PAST you will enjoyment with watching.EZ.F it make more than once Every movie, I said you will enjoy watching it more than once.	Every movie 90% 9	I 0% 0	10% 1	0% 0	Every ,ovie 50% 5	I 0% 0	20% 2	80% 8
(9) Hemî komêntên Azadî, te got ku ew pêdivîye wan ladet. All comment.EZ.P Azad you say.PAST Comp he must them delet All Azad's comments, you said that he must delete them.	All Azad's comments 100% 10	you 0% 0	0% 0	10% 1	All Azad's comments 55%	you 0% 0	10% 1	60% 6
(10) Her wêneyek, min got pêdivîye tu temaşa wî bikey. Any picture I say.PAST must-is you watch.EZ.F it make Any picture, I said you have to watch it.	Any picture 100% 10	I 0% 0	0% 0	0% 0	Any picture 80% 8	I 0% 0	0% 0	90% 9
(11) Qutabîyê wê yê kislan, me nevêt bêjîne çi mamosta ku wî qopiya di ezmûnê da kir. Student-EZ.M her EZ.M bad we NEG-want tell-to any teacher that he cheating in exam LOC do.PAST Her bad student, we don't want to tell any teacher that he cheated on the exam.	bad student 90% 9	We 0% 0	10% 1	0% 0	bad student 70% 7	we 0% 0	50% 5	80% 8
(12) Qutabîyê wê yê kislan, çi mamosta nevêt bizanît boçî rêveber wî ji qutabixanê derêxist. Student-EZ.M her EZ.M bad no teacher NEG-want know why principal him from school out-kick.PAST Her bad student, no teacher wants to know why the principal expelled him from the school.	bad student 90% 9	No teacher 0% 0	10% 1	0% 0	bad student 80% 8	No teacher 0% 0	50% 5	80% 8
(13) Qutabîyê wê yê kislan, me digel çi mamosta neaxivt berî ku ev sergêje bigehît. Student-EZ.M her EZ.M bad we with any teacher NEG-talk.PAST before Comp this idiot arrive.PAST-3Sg Her bad student, we didn't talk to any teacher before this idiot arrived.	bad student 90% 9	We 0% 0	10% 1	10% 1	bad student 110% 10	We 0% 0	50% 5	90% 9
(14) Heval, min dihî ew dît. Haval, I yesterday see.PAST Haval, I saw him yesterday.	Haval 100% 10	I 0% 0	0% 0	10% 1	Haval 50% 5	I 0% 0	60% 6	90% 9
(15) Ev şikatlêkrawe, tu sersam buy wextê te zanî ku ew dê wê hnêrine zîndanê. This defendant you surprised became when you knew they will her send jail This defendant, you were surprised when you learnt that they will send her to jail.	This defendant 90% 9	You 0% 0	10% 1	0% 0	This defendant 60% 6	You 0% 0	40% 4	80% 8
(16) Kîj wênê Conî wî ew da Marîyê? Which photograph-EZ.M John he it give.PAST Mary Which photograph of John did he give it to Mary?	Photograph 100% 10	John 0% 0	0% 0	0% 0	Photograph 50% 5	John 0% 0	50% 5	80% 8
(17) Kîj nexoş her dixtor ew serincî da? Which patient every doctor him examining do.PAST	Patient 90%	doctor 0%	10% 1	20% 2	Patient 20%	Doctor 0%	80% 8	90% 9

Which patient did every doctor examine him?	9	0			2			
(18) Birayê Leylayê, wê pirsyar kir boçî rêveberî ew derêxist. Brother.EZ.M Layla she question do.PAST why director him expel.PAST The brother of Layla, she asked why the director expelled him.	Layla's brother 100% 10	Layla 0% 0	0% 0	10% 1	Layla's brother 80% 8	Layla 0% 0	20% 2	90% 9
(19) Birayê Leylayê, wê got ku mejîhişk çû. Brother.EZ.M Layla she say.PAST Comp idiot leave.PAST The brother of Layla, she said that the idiot left.	Layla's brother 100% 10	Layla 0% 0	0% 0	0% 0	Layla's brother 80% 8	Layla 0% 0	60% 6	90% 9
(20) Birayê Leylayê, ew tore bû çunkî ew çû. Brother.EZ.M Layla she upset become.PAST because he leave.PAST The brother of Layla, she got upset because he left"	Layla's brother 100% 10	Layla 0% 0	10% 1	20% 2	Layla's brother 80% 8	Layla 40% 4	20% 2	60% 6

APPENDIX 7: PROFICIENCY TEST

PAPER 3 USE OF ENGLISH (1 hour)

Part 1

For questions **1–12**, read the text below and decide which answer (**A, B, C** or **D**) best fits each gap. There is an example at the beginning **(0)**.

Mark your answers **on the separate answer sheet**.

Example:

0 A scenery **B** panorama **C** spectacle **D** outlook

Example: | 0 | A | B | C | D |

A guidebook writer

He is five thousand metres up in the Peruvian Andes, with a view of magnificent **(0)** ..... all around. Looking down at the snow-capped mountains **(1)** ..... out below, Peter Hutchison can be **(2)** ..... for thinking that he has the best job in the world. But the **(3)** ..... required to keep it sometimes **(4)** ..... him out. Some days his head **(5)** ..... not from lack of oxygen but from the **(6)** ..... of checking rooms in fifty different hotels.

Peter is in charge of a team of writers working on a series of travel guidebooks. 'Each guidebook contains hundreds of thousands of facts,' he says. 'When I am on a research trip, I sometimes note down eighty points of **(7)** ..... in one day. **(8)** ..... to popular belief, being a travel writer is no holiday! So that others can get the most out of their trips, I have to **(9)** ..... long hours.'

After driving himself hard for a week, Peter **(10)** ..... himself by taking a few days off to **(11)** ..... his own favourite leisure activities, which include scuba-diving and jungle treks. He has an amazingly comprehensive knowledge of South America. 'I'd love to live here permanently,' he says, 'but I have to return to London to chase up the other contributors and make sure the latest book doesn't fall behind **(12)** ..... . It's due out in October and mustn't be late.'

1	A expanding	B spreading	C broadening	D lying
2	A mistaken	B tolerated	C spared	D forgiven
3	A force	B power	C effort	D attempt
4	A wears	B brings	C works	D bears
5	A turns	B spins	C winds	D twists
6	A strain	B affliction	C suffering	D distress
7	A interest	B attention	C value	D attraction
8	A Opposite	B Contrary	C Alternative	D Distinct
9	A put in	B take up	C make over	D get into
10	A celebrates	B delights	C rewards	D praises
11	A perform	B pursue	C maintain	D attend
12	A timetable	B programme	C schedule	D agenda

Part 2

For questions **13–27**, read the text below and think of the word which best fits each gap. Use only **one** word in each gap. There is an example at the beginning **(0)**.

Write your answers **IN CAPITAL LETTERS on the separate answer sheet.**

Example: 0 | W | I | T | H | O | U | T |

The history of the cinema

In Britain, the cinema was, **(0)** ..... doubt, the most important form of public commercial entertainment of the twentieth century. Until its popularity was eclipsed in the 1950s by television, cinema enjoyed a period of some fifty years during **(13)** ..... its appeal far exceeded **(14)** ..... of sport or indeed any other commercial leisure activity.

The popularity of the cinema at that time is **(15)** ..... difficult to explain: it was accessible, glamorous and cheap. At **(16)** ..... height, between 1920 and 1950, a very small sum of money **(17)** ..... guarantee a good seat in the cinema. In the 1920s, the usual venue was a small, neighbourhood hall. The audience was drawn from the local area, and could **(18)** ..... some occasions be rather noisy. By the end of the 1930s, **(19)** ..... , the venue was more likely to be in **(20)** ..... of the larger cinemas known as 'picture palaces', which were springing up everywhere in city centres **(21)** ..... accommodate audiences of over two thousand people. **(22)** ..... these establishments, the audiences were expected to be well behaved; the performances were organised just **(23)** ..... military operations, **(24)** ..... uniformed staff on hand to control the queues and usherettes to direct seating arrangements.

These large cinemas attracted **(25)** ..... very mixed audience, although older people were less likely to be cinema-goers than adolescents. As might be expected, people in rural areas were **(26)** ..... immersed in the cinema than were people in towns, simply **(27)** ..... of the greater provision of cinemas in urban areas.

Part 3

For questions **28–37**, read the text below. **Use** the word given in capitals at the end of some of the lines to form a word that fits in the gap **in the same line**. There is an example at the beginning **(0)**.

Write your answers **IN CAPITAL LETTERS on the separate answer sheet**.

Example: | 0 | W E S T E R N |

How music was written down

The familiar **(0)** ..... system of notation – writing down music using symbols –	**WEST**
has taken thousands of years to develop. In ancient times, elaborate music	
was in **(28)** ..... , even though it was never written down. Eventually, however,	**EXIST**
(29) ..... felt the need to record their music, and so the search began	**CIVILISE**
for a system of symbols that could **(30)** ..... denote the exact pitch of the	**RELY**
note to be sung or played, and at the same time tell the **(31)** ..... how long	**PERFORM**
that note should be held.	
The ancient Greeks and Romans did this by using their alphabetical letters	
in a **(32)** ..... of ways, but the slow development of notation could not keep	**VARY**
pace with **(33)** ..... complex musical developments. The 13th century saw	**INCREASE**
the introduction of colours to represent more complex note values.	
With the invention of printing in the 15th century, the writing of notes was	
(34) ..... to black and white and the number of lines became fixed at five.	**STANDARD**
By the middle of the 18th century, musical notation had settled down to its	
modern usage.	
The main **(35)** ..... to this system has been the adoption of expression marks,	**ADD**
which multiplied **(36)** ..... in the 19th century. These convey the composer's	**SIGNIFY**
intentions as regards speed, **(37)** ..... and so on, to the player	**INTENSE**
or singer.	

Appendix 8: Coefficients of a generalised linear mixed model fitted to Behdini speakers' acceptability data for non-islands to measure Proficiency effects (Reference levels: Chain.Foot: resumptive, Origin.Clause: wh-clause)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	2.3513	0.7952	2.957	0.00311 **
Origin.Clauserelative	-1.2999	0.2938	-4.424	9.68e-06 ***
Chain.Footgap	-2.6585	0.6332	-4.199	2.69e-05 ***
Proficiency	-1.8341	1.0493	-1.748	0.08049
Origin.Clauserelative:Chain.Footgap	1.5284	0.2746	5.566	2.61e-08 ***
Chain.Footgap:Proficiency	1.0515	0.8280	-8.300	2.69e-05 ***

Appendix 9: Coefficients of a mixed-effect linear model fitted to the log-transformed reaction time data for Behdini non-islands to measure Proficiency effects (Reference levels: Chain.Foot:resumptive, Origin.Clause:wh-clause, Tense:non-past)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	65115	8. 0.43130	20.058
Origin.Clauserelative	-0.29333	0.13657	-2.148
Chain.Footgap	-1.87838	0.36212	-5.187
Proficiency	-0.87653	0.57936	-1.513
Origin.Clauserelative:Chain.Footgap	0.81201	0.09568	8.487
Chain.Footgap:Proficiency	0.79441	0.49492	1.605

Appendix 10: Coefficients of a generalised linear mixed model fitted to Behdini speakers' acceptability data for relative clauses to measure Proficiency effects (Reference levels: Chain.Foot: resumptive)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	1.0714	0.6991	1.533	0.1254
Chain.Footgap	-0.6184	0.4692	-1.318	0.1875
Islandyes	-0.5666	1.0271	-0.552	0.5812
Proficiency	-2.2100	0.9638	-2.293	0.0218 *
Chain.Footgap:Islandyes	-1.4514	1.3826	-1.050	0.2939
Chain.Footgap:Proficiency	1.7039	0.6570	2.594	0.0095 **
Islandyes:Proficiency	2.0926	1.3743	1.523	0.1278
Chain.Footgap:Islandyes:Proficiency	2.5869	1.9685	1.314	0.1888

Appendix 11: Coefficients of a mixed-effect linear model fitted to the log-transformed reaction time data for Behdini relative clauses to measure Proficiency effects (Reference levels: Tense: non-past, Chain.Foot: resumptive, L1: Behdini, Island: no)

Fixed effects:	Estimate	Std. Error	t value
(Intercept)	8.24700	0.39597	20.827
Tensepast	-0.23725	0.04359	-5.443
Chain.Footgap	-0.94048	0.29699	-3.167
Islandyes	1.19208	0.44030	2.707
Proficiency	-0.84330	0.54889	-1.536
Tensepast:Chain.Footgap	0.16179	0.06083	2.660
Chain.Footgap:Islandyes	-0.70293	0.52150	-1.348
Islandyes:Proficiency	-0.05183	0.60484	-0.086
Chain.Footgap:Proficiency	1.16207	0.41098	2.828
Chain.Footgap:Islandyes:Proficiency	-0.68156	0.72444	-0.941

Appendix 12: Coefficients of a generalised linear mixed model fitted to Behdini speakers' acceptability data for islands to measure Proficiency effects (Reference levels: Chain.Foot: resumptive, Origin.Clause: adjunct)

Fixed effects:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.42765	0.70482	0.607	0.544022
Chain.Footgap	-1.08158	0.58453	-1.850	0.064264 .
Origin.Clauserelative	0.58716	0.49174	1.194	0.232463
Origin.Clausesentential.subject	0.27136	0.46711	0.581	0.561295
Origin.Clausewh.clause	1.35821	0.47420	2.864	0.004181 **
Proficiency	-0.79003	0.88980	-0.888	0.374609
Chain.Footgap:Origin.Clauserelative	-0.08305	0.32638	-0.254	0.799147
Chain.Footgap:Origin.Clausesential.subject	-0.10340	0.29092	-0.355	0.722270
Chain.Footgap:Origin.Clausewh.clause	-0.73626	0.30852	-2.386	0.017015 *
Chain.Footgap:Proficiency	2.84177	0.79156	3.590	0.000331 ***