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ON NEGATION AND DISJUNCTION IN L2 ENGLISH IN AN L1 ROMANIAN CONTEXT

Abstract. This experimental study investigates how Romanian-speaking learners of L2 English interpret disjunction in negative sentences, focusing on whether they exhibit L1 transfer effects from Romanian or successfully acquire the English pattern. While English and Romanian are traditionally considered to fall in the same category according to the Disjunction Parameter (Szabolcsi, 2002), favouring the conjunctive interpretation (-PPI value), recent research (Lungu *et al.*, 2021) suggests that Romanian speakers prefer the disjunctive reading (+PPI value). Through three experimental studies, I investigated: (i) how English speakers interpret disjunction in negative sentences, (ii) how Romanian speakers interpret disjunction, and (iii) because I found differences, how Romanian-speaking learners of L2 English interpret disjunction. The results of the first two studies showed that there are differences between the preferred interpretation of disjunction in negative sentences in English and Romanian. Based on these results, I conducted a third study to investigate how Romanian learners of L2 English interpret disjunction in English negative sentences. This study showed evidence of L1 transfer among L2 learners, supporting the Full Transfer Full Access Hypothesis (Schwartz & Sprouse, 1996), indicating that while L1 transfer initially influences L2 acquisition, learners can ultimately reset parameter values based on L2 input.

Keywords: negation, disjunction, polarity items, Disjunction Parameter, second-language learning, transfer

1. Introduction

The aim of this study is to investigate how Romanian-speaking learners of L2 English interpret disjunction in negative sentences. One of the

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main concerns is whether natural languages behave as predicted by formal rules of semantics or if they display a different behaviour. In case differences are found between the interpretation of disjunction in English and Romanian, the other main concern is how the mother tongue influences the interpretation of disjunction in a second language with a different behaviour.

The first step is understanding the interaction between negation and disjunction. This can be achieved by exploring how negation interacts with polarity items since disjunction assumes the properties of different polarity items depending on the language.

The second step is establishing a baseline in both English and Romanian regarding the preference for the interpretation of disjunction in negative sentences. This helps draw conclusive results for how the grammar of the mother tongue influences the learning of the target language's grammar.

This research contributes to the broader discussion on polarity sensitivity, parameter setting in second-language learning and transfer patterns in the acquisition of the grammar of the second language.

2. The Disjunction Parameter

This section investigates polarity items and their interaction with negation, setting the foundation for understanding the Disjunction Parameter, since disjunction mirrors the behaviour of either Negative or Positive polarity items in its interaction with clause-mate negation. By examining how negation interacts with both Negative and Positive polarity items, this section provides insight into why languages exhibit different interpretation patterns in the case of disjunction in negative contexts.

2.1 Polarity Items

Polarity items are lexical items sensitive to the polarity of the context they appear in. The two types of polarity items are Negative polarity items (NPIs) and Positive polarity items (PPIs).

The distribution of NPIs is in "negative, downward entailing, and nonveridical contexts (which may be upward entailing)" (Giannakidou, 2011, p. 1665), contexts which can be referred to by using the umbrella term "non-assertive". Examples of non-assertive contexts are, among others, negation (1a), questions (1b), the context introduced by the preposition *without* (1c):

(1) a. *Bill didn't buy any book*s. (Giannakidou, 2011, p. 1662)
b. *Did you see anybody?* (Giannakidou, 2011, p. 1672)
c. *… without wanting to see even his own child* (Giannakidou, 2011, p. 1689)

With respect to the discussion on negation, the difference between NPIs and PPIs is:

> Negative polarity items are lexical elements with a restricted distribution: they occur in negative contexts (…). Positive polarity items, on the other hand, are in general excluded from negative contexts. (van der Wouden. 1994, p. 1)

As a functional element, negation licenses and c-commands Negative polarity items (NPIs). Positive polarity items (PPIs) are, under normal conditions, not felicitously used in negative sentences because they escape the c-commanding properties of functional negation given their clash in polarity. Thus, when PPIs appear in the same sentence as negation, they are not c-commanded by negation, giving rise to an inverse scope reading with a shift in interpretation:

(2) a. *He didn't eat any of the cookies.*
b. *He didn't eat some of the cookies.*

In example (2b), although negation and a PPI appear in the same sentences, the PPI is not within the scope of negation. There is also a difference in interpretation when the PPI is used in such a case. The difference is in probability; when a PPI is used, there is a greater likelihood that some cookies were eaten while others were not, than in the case when the NPI is used, when the likelihood of cookies being eaten is null.

To sum up, negation can only license and c-command NPIs (Neg>NPI). When PPIs appear in a negative sentence, they are neither licensed nor c-commanded by negation. This gives rise to a reading that does not reflect the linear order (PPI>Neg).

2.2 The Disjunction Parameter

As a logical operator, negation can occur in the same context as other logical operators, such as disjunction. The way in which they interact mirrors the interaction between negation and polarity items.

According to de Morgan's law, the interaction between negation and disjunction has the following interpretation: $\neg (p \vee q) = \neg p \wedge \neg q$ (Szabolcsi, 2002, p. 217). In this case, disjunction has the same property as NPIs, meaning that they can both scope below c-commanding negation. However, the behaviour of negated disjunction in natural languages can also be: $\neg (p \vee q) = \neg p \vee \neg q$, seemingly disobeying de Morgan's law. In this case, disjunction has the same property as PPIs, meaning that they cannot scope below c-commanding negation to begin with.

The interpretation of negated disjunction can vary in natural languages, and what is responsible for such interpretation differences is the relative scope negation can take with respect to disjunction.

On the one hand, negation can have wide scope with respect to disjunction and this scopal interaction results in an interpretation that obeys de Morgan's law. This is the conjunctive reading of disjunction in negative sentences, also known as the "'neither' reading" (Szabolcsi, 2002, p. 217) – both members of the disjunction are negated at the same time. In this case, linear order goes hand in hand with the scopal relation between the two operators (Neg>Disj). This phenomenon has been observed in languages in which the disjunctive operator can scope below the negative operator, i.e., it behaves like an NPI.

An example of the conjunctive reading is (3) below:

(3) *Mary didn't order pizza or salad.*
Mary didn't order pizza and Mary didn't order salad. (Pagliarini *et al.*, 2022, p. 98)

On the other hand, negation can have narrow scope with respect to disjunction, resulting in an interpretation that seems to invalidate de Morgan's law. This is the disjunctive reading, also known as the "'I don't know which' reading" (Szabolcsi, 2002, p. 217) – either one member of the disjunction is negated, or the other member is, but not both of them at the same time. In this case, linear order and relative scope do not go hand in hand, and the resulting interpretation involves inverse scope of disjunction with respect to negation (Disj>Neg). This phenomenon has been attested in languages in which the disjunctive operator cannot scope below the negative operator, i.e., it behaves like a PPI.

An example of the disjunctive reading is (4) below:

(4) *Mary didn't order pizza or salad.*
Mary didn't order pizza or Mary didn't order salad. (Pagliarini *et al.*, 2022, p. 98)

This cross-linguistic variation concerning the behaviour of disjunction in negative sentences is known as the Disjunction Parameter, introduced by Szabolcsi (2002) and Szabolcsi and Haddican (2004):

> English disjunction (...) happily scopes below a c-commanding negation and dutifully obeys the de Morgan laws, whereas the Hungarian counterparts either must scope above the c-commanding negation or fail to obey the de Morgan laws. Such contrasts are not restricted to English versus Hungarian. Similar to English is German; similar to Hungarian are Russian, Serbian, Italian and Japanese, among other languages. (Szabolcsi & Haddican, 2004, p. 220)

Nonetheless, a study by Lungu et al. (2021) reveals that the difference between the two possible interpretations of disjunction in negative sentences is subject to preference and the degree of PPI behaviour that disjunction displays. Thus, the Disjunction Parameter (Szabolcsi, 2002) can be rephrased as: in English-like languages, the preference is for the conjunctive interpretation since disjunction exhibits a low PPI behaviour, in Hungarian-like languages the preference is for the disjunctive interpretation since disjunction exhibits a high PPI behaviour. According to this parameter, Romanian is considered

to behave similarly to English (Szabolcsi, 2002, p. 220). This means that the preference in Romanian is considered to be for the -PPI value of disjunction, thus giving rise to the conjunctive reading.

Various studies conducted on both children (Gualmini & Crain, 2005) and adults (Grüter *et al.*, 2010; Lungu *et al.*, 2021; Jasbi *et al.*, 2023) confirm that, in English, the preferred interpretation of disjunction in negative sentences is the conjunctive interpretation.

A study conducted in 2024 by Bleotu et al. on children confirms that the preferred interpretation of negated disjunction in Romanian is the conjunctive one. A study conducted in 2021 by Lungu et al. shows that in Romanian, adult native speakers interpret disjunction differently from child native speakers.

Moreover, several studies indicate that, even in languages in which the preferred interpretation of disjunction in negative sentences is the conjunctive reading, children go through a conjunctive-like stage in acquiring this interaction in their mother tongue (Verbuk, 2006, for Russian; Grüter *et al.*, 2010, for Japanese; Pagliarini *et al.*, 2022 for French, Italian and Hungarian; Bleotu *et al.*, 2024, for Romanian). This relation between the disjunctive and the conjunctive reading is similar to a subset-superset relation. The disjunctive reading is the subset or the default interpretation, first acquired by children and then subject to change based on positive input from adult language. Since in some languages the conjunctive reading is preferred by adults, children do not need to reset their initial parameter setting for disjunction. At the same time, in neither +PPI nor -PPI languages, is the opposite parametric value for disjunction prohibited (as shown by Lungu *et al.*, 2021); it is a matter of preference for one of those readings.

2.3 Challenging the Disjunction Parameter

The study conducted by Lungu *et al.* (2021) on how adult speakers of English, Romanian, Italian and French challenges the Disjunction Parameter with respect to: the preferred interpretation of disjunction in Romanian and with the clear-cut distinction made by the parameter in question.

This study investigated the interpretation assigned to disjunction in negative sentences in four languages: English and Romanian, considered part of the –PPI class of languages, and French and Italian, considered part of the +PPI class of languages according to the Disjunction Parameter. The task was an acceptability judgment task and participants were asked to judge, on a Likert scale from 1 to 7, how natural they believed the continuations in (5a) and (5b) were for the sentence containing clause-mate negation and disjunction.

(5) *If I remember correctly, Mary didn't invite John or Suzi to her birthday party.*
   a. narrow scope continuation: *She's upset with both of them and doesn't want to see them*
   b. wide scope continuation: *I don't know which of them.* (Lungu *et al.*, 2021, p. 223)

The narrow scope continuation indicates that the participants prefer conjunctive reading, according to which disjunction is interpreted as an NPI. The wide scope continuation indicates that the participants prefer the disjunctive scope reading, according to which disjunction is interpreted as a PPI.

The results from the English group indicated that both the conjunctive and the disjunctive reading are available, with a more pronounced acceptability rate for the conjunctive interpretation.

The results from the Romanian group also indicated that both interpretations are possible, but with no clear preference for either the disjunctive or the conjunctive reading since the acceptability rates were very similar. On the one hand, these results indicated that disjunction in Romanian is not interpreted as it is in English, thus challenging the Disjunction Parameter. On the other hand, such results indicated that the behaviour of disjunction in negative sentences in Romanian is similar to the behaviour in French and Italian (the +PPI interpretation) given the similar acceptability rates for the wide scope continuation.

To sum up, the authors concluded that what differentiates languages is not the clear-cut distinction made by the Disjunction Parameter, but the "degree to which disjunction exhibits PPI behaviour" (Lungu *et al.*, 2021, p. 227). In all languages investigated, disjunction exhibited both

−PPI and +PPI behaviour, but to different degrees: in English, the degree of +PPI behaviour was low, while in Romanian, it was high.

3. Aims and Research Questions

This study aims to investigate how the interaction between negation and disjunction is interpreted by Romanian-speaking learners of L2 English since, to the best of my knowledge, the combination between L1 Romanian and L2 English has not been explored in the literature. In order to do so, it is important to determine the starting point in Romanian and the desired end point in English as regards negated disjunction.

The results in Lungu *et al.* (2021) challenge the predictions made by the Disjunction Parameter, mainly concerning the preference in Romanian. Thus, I investigated the preferred interpretation of disjunction in negative sentences in both English and Romanian.

The first research question is:

(i) Do English and Romanian differ with respect to the preferred interpretation of disjunction in negative sentences, as shown in Lungu *et al.* (2021) or do they behave alike, as assumed in Szabolcsi (2002)?

If it is revealed that English and Romanian display different preference patterns, two more research questions appear:

(ii) Can Romanian speakers successfully acquire the interaction between disjunction and negation in L2 English?

(iii) Is there evidence of transfer in the learning of the interaction between negation and disjunction from L1 Romanian to L2 English?

Therefore, three experimental studies were conducted: the first to investigate the preferred interpretation of negated disjunction in English, the second to investigate the preference in Romanian, and the third to investigate the preferred interpretation of Romanian-speaking learners of L2 English.

4. Negation and Disjunction in English

As seen before, the interaction between negation and disjunction has been extensively studied and results indicate that the preference in English is for the conjunctive interpretation according to which negation has wide scope over disjunction. Nevertheless, the study on how adult native speakers of English interpret this interaction presently conducted serves as a baseline for comparison with Romanian speakers and Romanian-speaking learners of L2 English performed in subsequent sections, since the same task was used.

4.1 Task and Procedure

All three studies used a question-after-story design, identical for the two languages. All participants received a Google Forms link.

A narrator, Bibi, told the participants a story about various animals. The narrator was introduced so that the "I don't know which" interpretation could appear naturally (i.e., the narrator was under-informative).

All the questions followed a similar scenario: Bibi tells the participant a story about her friend. In the story, the friend met a personified animal and asked him/her to interact with two items, for example, the friend asked the animal to photograph a statue and a painting. Then, the friend left the scene and the animal decided that he/she did not want to interact with the items in the way that he/she had been asked to. The friend then returns and does not know what the animal did. The friend then guesses and makes a statement about how the animal interacted with the objects. The participant is asked if the friend made the right guess and has two answering options: *yes* and *no*.

The task included 2 warm-up scenarios, 8 fillers and 16 test questions. The 16 test questions were divided into four groups depending on scenario type and the negative statement at the end of the story:

(i) scenario type:
The animal decided to either interact with none of the items provided or interact with only one of the items.

(ii) negative statement at the end of the story:
The statement either contained the discontinuous disjunction *neither…nor* or it contained negation and the disjunction morpheme *or*.

The combination between scenario type and negative statement resulted in four conditions: a *NONE – neither...nor* condition, a *1DT – neither...nor* condition, a *NONE – NEG…or* condition and a *1DT – NEG…or* condition. In the first condition, the animal interacted with none of the items and the negative statement contained *neither…nor.* In the second condition, the animal interacted with only one item and the negative statement contained *neither…nor.* In the third condition, the animal interacted with no item and the negative statement contained negation and disjunction. In the fourth condition, the animal interacted with only one item and the negative statement contained negation and disjunction.

Therefore, the critical test questions, i.e., the test questions directly indicating the preferred reading of disjunction in negative sentences, are the *NONE – NEG…or* condition and a *1DT – NEG…or* condition since they are the ones containing clause-mate negation and disjunction.

An example of the *NONE – NEG…or* condition in English is:

(6) *Bibi tells us a story:*
One day, I was in the forest with Vivi. A bear who is friends with Vivi saw us and came to us. Vivi picked a mushroom, a flower. Vivi asked the bear to put them in a basket while she went to the river. Then, Vivi left.
While Vivi was at the river, the bear decided that he didn't want to put the items in the basket.
Vivi returns, but she doesn't know what happened.
Vivi says: "The bear didn't put the mushroom or the flower in the basket."
Is she right?
A. Yes
B. No

For this condition, the *yes* answer indicates that the participants accept the use of *NEG...OR* in scenarios in which both members of the disjunction are negated. This is indicative of the conjunctive reading.

An example of the *1DT – NEG…or* condition in English is:

(7) *Bibi tells us a story:*
One day, I was at the market with Jenny. A mouse who is friends with Jenny saw us and came to us. Jenny bought a carrot, an onion. Jenny asked the mouse to put them in the bag while she went to the bakery. Then, Jenny left.
While Jenny was at the bakery, the mouse decided that he wanted to put only one vegetable in the bag.
Jenny returns, but she doesn't know what happened.
Jenny says: "The mouse didn't put the carrot or the onion in the bag."
Is she right?
A. Yes
B. No

For this condition, the *yes* answer indicates that the participants accept the use of *NEG...OR* in scenarios in which only one member of the disjunction is negated, while the other remains true. This is indicative of the disjunctive interpretation.

4.2 Participants and Results

In total, 31 participants (age range 18–77, mean age = 39.03) were included. They were recruited online via the Prolific platform and were native speakers of British English. It took the participants, on average, approximately 10 to 15 minutes to complete the task.

In total 806 answers were received, out of which 496 were answers to the test questions, 124 per condition.

For the *NONE – NEG…or* condition, 119 answers were *yes* (96%) and 5 were *no* (4%). For the *1DT – NEG…or* condition, 8 answers were *yes* (6.5%) and 116 were *no* (93.5%). For both these conditions, the answers were consistent and indicated a clear preference for the conjunctive interpretation.

The results are summarised in Table 1.

Table 1

Negation and Disjunction in English

Condition	**NONE – neither nor**		**1DT – neither nor**		**NONE – NEG…or**		**1DT – NEG…or**	
Answer	yes	no	yes	no	yes	no	yes	no
No. answers	93.5% (n = 116)	6.5% (n = 8)	4% (n = 5)	96% (n = 119)	96% (n = 119)	4% (n = 5)	6.5% (n = 8)	93.5% (n = 116)

These results indicate that the native speakers of English interpreted disjunction in negative sentences both as +PPI and as –PPI, but to different degrees. This is in line with the results reported in Lungu et al. (2021), which assume that both interpretations are available in all languages. However, one interpretation was clearly preferred: the conjunctive interpretation of disjunction in negative sentences, the interpretation according to which both disjuncts are negated because the disjunction operator has a –PPI value and scopes below c-commanding negation.

These results confirm the status of English as a –PPI language, as predicted by the Disjunction Parameter (Szabolcsi, 2002; Szabolcsi & Haddican, 2004).

5. Negation and Disjunction in Romanian

According to the Disjunction Parameter (Szabolcsi, 2002) and the study conducted on children by Bleotu *et al.* (2024), the preferred interpretation of disjunction in negative sentences in Romanian is the –PPI value. However, according to Lungu et al. (2021), the preference is towards the +PPI interpretation.

Given these contradictory results, in order to investigate how Romanian-speaking learners of L1 English interpret disjunction, it is important to establish the starting point in their mother tongue. Therefore, an experimental study on adult Romanian speakers was conducted.

5.1 Task and Procedure

The experimental study on Romanian speakers uses the same question-after-story task, translated into Romanian. Participants received a Google Forms link and it took them, on average, approximately 10 to 15 minutes to complete the task.

Below is an example of the *NONE – NEG…or* condition in Romanian, the translated equivalent of example (6) in English:

(8) *Bibi ne spune o poveste:*
Într-o zi, eram în pădure cu Vivi. Un ursuleț care e prieten cu Vivi ne-a văzut și a venit la noi. Vivi a cules o ciupercă, o floare. Vivi l-a rugat pe ursuleț să le pună într-un coș cât se duce ea la râu. Apoi, Vivi a plecat.
În timp ce Vivi era la râu, ursulețul a hotărât că nu vrea să pună obiectele în coș.
Vivi se întoarce, dar nu știe ce s-a întâmplat.
Vivi spune: "Ursulețul nu a pus ciuperca sau floarea în coș."
Are dreptate?
A. Da
B. Nu

Similarly, for this condition, the *yes* answer indicates the preference for the use of *NEG...OR* in scenarios in which both members of the disjunction are negated – the conjunctive reading.

Below is an example of the *1DT – NEG…or* condition in Romanian, the translated equivalent of example (7) in English:

(9) *Bibi ne spune o poveste:*
Într-o zi, eram la piața cu Jeni. Un șoricel care e prieten cu Jeni ne-a văzut și a venit la noi. Jeni a cumpărat un morcov, o ceapă. Jeni l-a rugat pe șoricel să le pună în sacoșă cât e ea plecată la cofetărie. Apoi, Jeni a plecat.
În timp ce Jeni era la cofetărie, șoricelul a hotărât că vrea să pună doar o legumă în sacoșa.
Jeni se întoarce, dar nu știe ce s-a întâmplat.
Jeni spune: "Șoricelul nu a pus morcovul sau barca în sacoșă."
Are dreptate?
A. Da
B. Nu

The same, the *yes* answer indicates the preference for the use of *NEG...OR* in scenarios in which only one member of the disjunction is negated, while the other remains true – the disjunctive interpretation.

5.2 Participants and Results

In total, 59 participants (age range 18–57, mean age = 35.25) were included. All participants were native speakers of Romanian; no distinction was made between linguistically-naïve participants and participants with knowledge of linguistics.

In total 1534 answers were received, out of which 944 were answers to the test questions, 236 answers per condition.

For the *NONE – NEG…or* condition, 236 answers were received, out of which 86 were *yes* (36.4 %) and 150 were *no* (63.6%). For the *1DT – NEG…or* condition, 180 answers were *yes* (73.3%) and 56 were *no* (27.7%).

The results are summarised in Table 2.

In the case of Romanian, there is no clear preference for one interpretation of disjunction in negative sentences. In line with Lungu *et al.* (2021), these results indicate that both interpretations are available in Romanian to different degrees.

The presence of 36.4% of *yes* answers in the *NONE – NEG…or* condition combined with the 23.7% of *no* answers in the *1DT – NEG…or* condition indicates that the conjunctive interpretation is possible in Romanian. These results are in line with the Disjunction Parameter (Szabolcsi, 2002; Szabolcsi & Haddican 2004).

However, the higher rate of *no* answers in the *NONE – NEG…or condition* combined with the higher rate of *yes* responses in the *1DT – NEG…or* condition indicates a preference for the disjunctive interpretation of disjunction in negative sentences.

These results challenge the analysis of Romanian as a –PPI language as predicted by the Disjunction Parameter (Szabolcsi, 2002; Szabolcsi & Haddican, 2004). However, they confirm the results obtained in the study by Lungu *et al.* (2021): what makes languages different is not the clear-cut distinction predicted by the Disjunction Parameter, but the degree to which they exhibit +PPI behaviour for disjunction in negative sentences.

Moreover, the results obtained from both the English and the Romanian experiments reveal there is a difference between the interpretation assigned by native speakers of English, who preferred the conjunctive interpretation (-PPI value of disjunction), and by native speakers of Romanian, who preferred the disjunctive interpretation (+PPI value of disjunction).

Table 2

Negation and Disjunction in Romanian

Condition	**NONE – neither nor**		**1DT – neither nor**		**NONE – NEG…or**		**1DT – NEG…or**	
Answer	yes	no	yes	no	yes	no	yes	no
No. answers	96.6% (n = 228)	3.4% (n = 8)	7.2% (n = 17)	92.8% (n = 219)	36.4% (n = 86)	63.6% (n = 150)	76.3% (n = 180)	27.7% (n = 56)

6. Negation and Disjunction in L2 English

The aim of this section is to investigate how L2 learners of English whose L1 is Romanian interpret disjunction in negative sentences. If the results reported in the previous sections are on the right track, Romanian and English have different preferences with respect to the interpretation of disjunction in negative sentences. Native speakers of English (almost categorically) prefer the conjunctive reading, whereas native speakers of Romanian mostly prefer the disjunctive reading.

An impressive number of L2 learning studies assume that the learning process can be affected by transfer from L1 (Schwartz & Sprouse, 1994; Schwartz & Sprouse, 1996). It is plausible to assume that, given the difference between English and Romanian, the learning of disjunction in negative sentences in L2 English will be affected by the L1 of the learners, namely Romanian.

6.1 Research Questions and Predictions

Given the differences found between the preference in Romanian and English, the present study investigates the learning of disjunction in negative sentences in L2 English in an L1 Romanian context with a view to answering the following questions:

(i) Can Romanian speakers set the value of the Disjunction Parameter in L2 English despite the difference between English and their L1?

(ii) Is there evidence of transfer in the learning of the interaction between negation and disjunction from L1 Romanian to L2 English?

I assume the Full Transfer Full Access Hypothesis (Schwartz & Sprouse, 1994; Schwartz & Sprouse, 1996), according to which both the grammar of L1 and Universal Grammar guide the learner in the initial stages of L2 learning.

The term 'Full Transfer' refers to the fact that, in the initial stages of L2 learning, the learner relies on his/her L1 grammar and transfers parameter settings to their L2. In the following stages of learning, the

grammar of L1 becomes insufficient and cannot account for the differences between L1 and L2. This is where the term 'Full Access' comes into play; it refers to the interlanguage phase in which there is variation between the two possible values of the parameters in question. Universal Grammar guides the L2 learners towards setting the appropriate parametric value.

It is expected that, at least initially, Romanian-speaking learners of L2 English would prefer the +PPI interpretation, thus incorrectly interpreting disjunction in negative sentences in English, where the parametric value is -PPI with a preference for the conjunctive interpretation. This transfer can give rise to a learnability problem, but the acquisition of the English-like interpretation is not impossible. In fact, based on experience and positive input, it is possible for learners to distance themselves from the parametric value specific to their L1 and assume the parametric value specific to the language they are learning because UG allows them to access this value.

A study focusing on possible transfer effects regarding the different parametric values was conducted by Grüter *et al.* (2010). The two languages investigated were considered different according to the Disjunction Parameter: English, in which negation has wide scope over disjunction since disjunction is interpreted as having the -PPI value, and Japanese, in which negation has narrow scope with respect to disjunction since disjunction is interpreted as having the +PPI value.

Four experiments were conducted: two on the control groups of native speakers of English and native speakers of Japanese, and two conducted on Japanese-speaking L2 English learners and English-speaking L2 Japanese learners.

All experiments were based on a truth-value judgement task involving animals in an eating contest, which received prizes depending on what food items they ate. Participants were asked to judge a sentence containing negation and disjunction and interpret it as true or false depending on the prize the animal had received. An example is (10) below:

(10) *The [animal] ate the cake, but he didn't eat the carrot or the pepper.* (Grüter *et al.*, 2010, p. 140)

The native speakers of English consistently indicated that their preferred interpretation is the one in which negation has wide scope over disjunction, which is interpreted as having the value -PPI.

The answers given by the native speakers of Japanese consistently indicated that the parametric value of disjunction in negative sentences is +PPI, meaning that negation has narrow scope in its interaction with disjunction.

The results received from the Japanese-speaking L2 English learners were similar to the answers given by the L1 Japanese speakers, not to the ones given by L1 English speakers. This shows that L1 influences the learning of L2.

The results received from the English-speaking L2 Japanese learners were mostly similar to the answers given by the L1 Japanese speakers, meaning that those participants successfully acquired the interpretation preferred in Japanese despite the difference from their L1. However, some participants consistently gave answers in accordance with the preferred interpretation in their L1, meaning that transfer patterns were still observed.

To sum up, the results in Grüter et al. (2010) indicate that the L2 learning of disjunction in negative sentences is subject to transfer from L1 irrespective of whether in L1 the preferred parameter setting of disjunction is +PPI or -PPI.

Based on this study and the experiments previously reported on L1 English and L1 Romanian, the prediction is that, when setting the parameter value preferred in English, -PPI, there will be transfer from the parameter value preferred in Romanian, +PPI, at least in the initial stages of learning.

6.2 Task and Procedure

The methodology employed a question-after-story task similar to the one used for the experiments on native speakers of English and native speakers of Romanian.

The only difference between the experiments with native speakers and the experiment with L2 learners of English was that, for the latter

group, the task was printed on paper and administered during English classes at school. On average, it took participants approximately 20 to 30 minutes to complete the task.

6.3 Participants

The participants were students in the 7th and 8th grades in a public school in Bucharest. In total, 46 participants (age range 13–15, mean age = 14.10) were included. The participants were required to self-assess their proficiency in English. Responses varied from A1 to B2, irrespective of the grade the students were in.

The L2 English participants were divided into two groups based on their self-assessed proficiency level. Two groups were formed: the A-level group, consisting of 16 participants whose proficiency level ranged between A1 and A2, and the B-level group, consisting of 30 participants whose proficiency level ranged between B1 and B2.

6.4. Results and Discussion

For the A-level group, 416 answers were received in total, out of which 256 were answers to test questions, 64 per condition. For the *NONE – NEG…or* condition, 39 answers were *yes* (60.9%) and 25 were *no* (39.1%). For the *1DT – NEG…or* condition, 23 answers were *yes* (35.9%) and 41 were *no* (64.1%). For both these conditions, the answers were not conclusive enough to indicate a clear preference towards the conjunctive or the disjunctive reading.

The results are summarised in Table 3.

For the B-level group, 780 answers were received in total, out of which 480 were answers to the test questions, 120 per condition. For the *NONE – NEG…or* condition, 73 answers were *yes* (60.8%) and 47 were *no* (39.2%). For the *1DT – NEG…or* condition, 55 answers were *yes* (45.8%) and 65 were *no* (54.2%). In this case, the difference was even lower than that for the A-group, thus no indication of interpretational preference could be established.

The results are summarised in Table 4.

Table 3

Acceptance rates for the A-level group

Condition	**NONE – neither nor**		**1DT – neither nor**		**NONE – NEG…or**		**1DT – NEG…or**	
Answer	yes	No	yes	no	yes	No	yes	No
No. answers	65.6% (n = 42)	34.4% (n = 22)	21.9% (n = 14)	78.1% (n = 50)	60.9% (n = 39)	39.1% (n = 25)	35.9% (n = 23)	64.1% (n = 41)

Table 4

Acceptance rates for the B-level group

Condition	**NONE – neither nor**		**1DT – neither nor**		**NONE – NEG…or**		**1DT – NEG…or**	
Answer	yes	No	yes	no	yes	No	yes	No
No. answers	89.2% (n = 107)	10.8% (n = 13)	5.8% (n = 7)	94.2% (n = 113)	60.8% (n = 73)	39.2% (n = 47)	45.8% (n = 55)	54.2% (n = 65)

Moreover, a one-way ANOVA without replication revealed no significant difference between the *yes*/*no* responses in the two scenarios (*NONE – NEG…or and 1DT – NEG…or*) with the A-level group: $F(3,45) = 2.26$, $p > .05$. There was no significant difference between the responses in the two scenarios in the B-level group either, as indicated by the results of a one-way ANOVA without replication: $F(3,87) = 1.09$, $p > .05$.

The results of the two groups were then compared in order to examine the possible effect of proficiency level. A chi-square test was conducted to examine the relation between group and *yes*/*no* responses in the *NONE* scenario. The relation between the two was not significant: $\chi 2$ (1, $N = 46$) = 0, $p = 1$. An additional chi-square test was performed to examine the relation between group and *yes*/*no* responses in the *1DT* scenario. The relation between the two was not significant either: $\chi 2$ (1, $N = 46$) = 1.2, $p > .05$. These results indicate that there was no significant difference between the two groups regarding the interpretation assigned to disjunction in negative sentences.

Therefore, the results were analysed as coming from one single group and, in order to get a better picture of the data, an analysis of the individual results of the 46 participants was performed. The focus was on identifying possible transfer effects, as well as on identifying the proficiency level at which L2 learners reach native-like interpretation of disjunction in negative sentences.

Firstly, the results received from all 46 participants, 184 per condition, are summarised in Table 5.

The results do not indicate a clear preference towards one of the interpretations, the disjunctive (Romanian-like) one or the conjunctive (English-like) one, given the small difference (<20%) between the rate of *yes* answers received in the *NONE – NEG…or* condition (60.6%) and the *yes* answers received in the *1DT – NEG…or* condition (42.2%).

Secondly, the individual analysis revealed three responder types: 1) conjunctive responders, 2) disjunctive responders, and 3) mixed responders.

Participants who gave 3 or more *yes* responses in the *NONE – NEG…or* condition and 3 or more *no* responses in the *1DT – NEG…or* condition were categorised as conjunctive responders (n = 20).

Participants who gave 3 or more *no* responses in the *NONE – NEG…or* condition and 3 or more *yes* responses in the *1DT – NEG…or* condition were categorised as disjunctive responders (n = 13).

Participants who either gave 3 *yes* responses in both the *NONE – NEG…or* and the *1DT – NEG…or* condition, or who gave 2 *yes* and 2 *no* responses in at least one of these conditions were categorised as mixed responders (n = 13).

Across all three groups, the participants ranged from the 7th to the 8th grade and from the A level to the B level irrespective of the response patterns they exhibited. The results according to the response pattern are summarised in Table 6.

The results of the conjunctive responders reveal a preference for the interpretation according to which disjunction is -PPI and can scope below c-commanding negation, thus giving rise to the conjunctive interpretation. These participants have successfully acquired the English-like interpretation and this indicates that L2 English learners can set the value of the Disjunction Parameter specific to English (-PPI), despite the different parametric value preferred in Romanian (+PPI).

The results given by the disjunctive responders reveal a preference for the interpretation according to which disjunction has the +PPI value and cannot scope below c-commanding negation, thus giving rise to the disjunctive interpretation. As predicted by the Full Transfer Full Access hypothesis (Schwartz & Sprouse, 1994; Schwartz & Sprouse, 1996), these participants are still at a stage in which they transfer the parametric value from Romanian to English, which has a different parametric value. These results are also in line with the findings in the study by Grüter *et al.* (2010) concerning the setting of a different parametric value of disjunction in a second language: there is positive evidence of transfer from L1 when the mother tongue and the second language display different parametric values of disjunction in negative sentences.

The results given by the mixed responders indicate that they do not have a clear preference regarding the interpretation of disjunction in negative sentences. This indicates that most of the mixed responders have gone beyond the full transfer stage of L2 learning and are in an intermediate stage, where the parameter specific to English (-PPI) is not fully set. However, the mixed responders can successfully set the parametric value preferred in English, as is proved by the responses given by the conjunctive responders.

Table 5

Acceptance rates for L1 Romanian – L2 English participants

Condition	**NONE – neither nor**		**1DT – neither nor**		**NONE – NEG…or**		**1DT – NEG…or**	
Answer	yes	no	yes	no	yes	no	yes	no
No. answers	81% (n = 149)	19% (n = 35)	11.4% (n = 21)	88.6% (n = 163)	60.9% (n = 112)	39.1% (n = 72)	42.4% (n = 78)	57.6% (n = 106)

Table 6

L1 Romanian – L2 English. Response patterns

	Conjunctive responders	**Disjunctive responders**	**Mixed responders**
	28.3% (n = 20)	43.5% (n = 13)	28.3% (n = 13)
Proficiency level	A2 – B2	A2 – B2	A1 – B2

Nevertheless, the analysis of the three responder patterns does not indicate a clear proficiency effect regarding the learning of disjunction in negative sentences as in all responder groups, proficiency levels ranged from A2 or A1 to B2.

To sum up, the results of the experiment conducted on Romanian-speaking learners of L2 English show, firstly, that there is evidence of transfer of the parametric value in L1 in the initial stages of L2 learning (recall the disjunctive responders). Secondly, these results reveal that it is possible to set the preferred parametric value in English despite its difference from the preferred parametric value in Romanian (recall the conjunctive responders).

7. Conclusions

The current study aimed to investigate the learning of the interaction between negation and disjunction in an L1 Romanian L2 English setting. To do so, it was necessary to first establish how native speakers of English and Romanian interpret disjunction in negative sentences in their own native language.

The preferred interpretation in English is the conjunctive one (Szabolcsi, 2002; Lungu *et al.*, 2021; Jasbi *et al.*, 2023). Given the contradictory information provided by the Disjunction Parameter (Szabolcsi, 2002) and Lungu *et al.* (2021) with respect to the preferred interpretation in Romanian, an experimental study was conducted to investigate how adult speakers of Romanian interpret disjunction in negated sentences.

The experimental studies conducted on native speakers of English and native speakers of Romanian indicate that the preferred value of disjunction is –PPI and +PPI, respectively.

The experiment conducted on Romanian-speaking learners of L2 English indicated a degree of variation between the -PPI and the +PPI interpretation. The results showed that there is no influence of the proficiency level on how participants interpret disjunction in negative sentences.

Nonetheless, positive evidence of transfer was discovered in the case of Romanian-speaking learners of L2 English and it was also discovered that, in spite of transfer from the +PPI value in Romanian, learners of L2 English can achieve the preferred interpretation in the target language (the –PPI value).

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