

EXPLORING LINGUISTIC LANDSCAPES.  
A FESTSCHRIFT FOR LARISA AVRAM AND ANDREI AVRAM

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The present volume honors the successful and productive scientific activity of Larisa Avram and Andrei Avram. Colleagues and collaborators from universities in Romania and around the world contributed with papers that span various domains of research: theoretical and experimental syntax and phonology, semantics and pragmatics.

**P E R S O N A L I T Ă Ţ I  
A L E U N I V E R S I T Ă Ţ I I  
D I N B U C U R E Ş T I**

EXPLORING LINGUISTIC  
LANDSCAPES.  
A FESTSCHRIFT FOR  
LARISA AVRAM AND ANDREI AVRAM

Edited by

Anca SEVCENCO, Irina STOICA,  
Ioana STOICESCU, Mihaela TĂNASE-DOGARU,  
Alina TIGĂU and Veronica TOMESCU



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## TABLE OF CONTENTS

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Tabula Gratulatoria .....	9
Foreword.....	11
Part I	
PHONOLOGY, SYNTAX AND SEMANTICS	
Charles REISS	
The phonologist-syntactician interface.....	15
Gabriela SLĂVUȚEANU & Ana BARBU	
On some features of the phonology of Qatari English.....	19
Alexandra CORNILESCU	
Remarks on Romance nominal structure: The NP-DP controversy.....	39
Mihaela TĂNASE-DOGARU	
Prepositional silent NPIs: The case of the Romanian <i>fără de N</i> construction ..	57
Anna CARDINALETTI & Giuliana GIUSTI	
Three classes of quantity nouns in Italian.....	71
Carmen DOBROVIE-SORIN & Ion GIURGEA	
Postnominal MANY <sup>superl</sup> in Romanian and the theory of MOST.....	87
Daniela ISAC	
Definite DPs in Jamaican Creole .....	103
Virginia HILL	
DOM and the theory of Applicative Phrases .....	117
Alina TIGĂU	
Some remarks on inverse binding and clitic doubling.....	129
Mara PANAITESCU	
The distribution of Romanian pre- and postnominal demonstratives: A comparison with Spanish .....	147
Irina STOICA & Gert-Jan SCHOENMAKERS	
Interrogative islands in Romanian .....	163

Maria Aurelia COTFAS	
Some considerations on the different combinatorial properties of epistemic <i>know</i> and doxastic <i>believe</i> in Romanian .....	191
Ștefan OLTEAN	
A semantic view of dual voice in free indirect discourse .....	211
Part II	
LANGUAGE ACQUISITION	
Petra SCHULZ	
What object relatives and temporal connectives have in common: Notes on two late acquired phenomena and the causes of lateness.....	225
F. Nihan KETREZ	
How to kiss a boy twice in Turkish: An experimental study on the scope of direct objects with respect to the adverb <i>twice</i> .....	243
Ioana STOICESCU	
The illocutionary complementizer <i>că</i> in adult and child Romanian .....	257
Adina Camelia BLEOTU	
Coloring the possible and the certain in child Romanian .....	275
Elena BUJA	
The acquisition of consonant clusters by Romanian-speaking children .....	287
Elena LĂCĂTUȘ & Viorela-Valentina DIMA	
First language acquisition: Monolingual child language development.....	311
Anamaria BENTEA	
An investigation into the production of <i>which</i> -questions by Romanian-speaking children and adults .....	333
Veronica TOMESCU	
Telicity in 2L1 Hungarian.....	351
Paul BUZILĂ	
A relational network approach to bilingualism.....	367
Marina ČAMBER & Wolfgang U. DRESSLER	
Croatian and German plural acquisition by simultaneous bilingual children: A blind alley development (BAD) .....	387
Martine COENE	
Germanic scrambling with a touch of Romance: Differential Object Marking in Afrikaans.....	401

Susann FISCHER	
The vulnerability of Differential Object Marking in language contact: What Larisa Avram's research taught me.....	419
Alexandru MARDALE & Elena SOARE	
On case in child heritage Romanian.....	435
Anca SEVCENCO	
Connectivity effects in the comprehension of L2 English topic constructions.	451
Part III	
TRANSLATION STUDIES AND LANGUAGE CONTACT	
Ruxandra DRĂGAN	
Trailing Harry Potter into Romance.....	467
Nadina VIȘAN & Daria PROTOPOPESCU	
Patterns of translating 'Harry Potter adverbs' in P.L. Travers' <i>Mary Poppins</i> series.....	485
Ruxandra VIȘAN	
Notes on film titles in translation.....	499
Costin-Valentin OANCEA	
Scottish voices: Representations of Scottish English in writing.....	515
Daniela Rodica FIRANESCU	
Halla' bi-ha-š-šāre'-da be-z-zabṭ... On mixed Syro-Egyptian from "Little Damascus" (Cairo).....	527
George GRIGORE & Gabriel BIȚUNĂ	
On the names of God in the translation of the Qur'an in Maltese.....	543

## AN INVESTIGATION INTO THE PRODUCTION OF *WHICH*-QUESTIONS BY ROMANIAN-SPEAKING CHILDREN AND ADULTS

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**Abstract:** This study reports the results of an elicited production experiment investigating the formation of subject and object *which*-questions in Romanian monolingual children and adults with the aim to uncover whether a subject-object asymmetry surfaces in the production of *which*-questions in Romanian and whether a mismatch in number modulates this asymmetry. The findings show that adults produce overall more *which*-questions than children. Both groups produce more target subject than object questions, while a mismatch in number does not facilitate the production of either subject or object questions. Significant differences emerge between children and adults with respect to the use of bare *who*-questions, passive object questions object questions introduced by ‘*what tiger*’ instead of ‘*which tiger*’. The results are coherent with intervention accounts (Friedmann et al. 2009), showing that children avoid intervention configurations in production, but they also point to additional difficulties with *which*-questions that can be related to set-restriction.

**Keywords:** Romanian, *which*-questions, production, intervention, number mismatch

### 1. Introduction

Within syntactic theory, *which*-questions are complex syntactic structures, also called A-bar/A'-dependencies, and are characterized as involving movement of the *wh*-phrase from its canonical position as subject or complement of the verb to the beginning of the sentence. While nothing intervenes in the movement of the subject (1), in the case of object questions (2) this movement takes place over an intervening subject.

- (1) Which employee admires the manager?
- (2) Which employee did the manager admire?

In the acquisition literature, *which*-questions have been shown cross-linguistically to display a subject over object preference when tested in comprehension. That is, children find subject *which*-questions easier to comprehend than object *which*-questions (for Dutch: Schouwenaars et al. 2014, for English: Avrutin 2000, Goodluck 2010, Contemori et al. 2018; for French: Bentea and Durrleman 2013; for German: Biran and Ruigendijk 2015, Roesch and Chondrogianni 2015, Schouwenaars et al. 2018; for Greek: Varlokosta et al.

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2014; for Hebrew: (Friedmann et al. 2009, Friedmann and Novogrodsky 2011, Friedmann et al. 2017; for Italian, De Vincenzi et al. 1999).

While there is a wealth of literature on the comprehension of *wh*-questions, there are fewer elicitation studies looking at children's productions of *wh*-questions and these generally focus on bare *wh*-questions (e.g. introduced by *who*, *what*, *where* or *why*). For instance, Guasti et al. (2012) elicited *who*- and *which*-questions from 3- to 5-year-old Italian-speaking children and found that children only produced object *which*-questions about 30% of the time, opting for other question formation strategies like object cleft questions, questions with a topicalised NP subject, or questions with a null pronominal subject. A subject-object asymmetry for *which*-questions has also been found for German-speaking children in a sentence repetition task (Biran and Ruigendijk (2015): children were more likely to repeat subject *which*-questions correctly compared to object *which*-questions and they often changed the object-first sentence into a subject-first sentence. It is worth noting, however, that a sentence repetition task does not only target production, but also involves comprehension because in order to be able to correctly repeat a sentence, children must also understand it to a certain degree as well. Schouwenaars et al. (2020) elicited subject and object *which*-questions from German-speaking children aged 7 to 10. They report that 13% of children's answers consisted of the targeted object *which*-questions and that children used passive questions (e.g. *Which geese were pulled by the fox?*) in 80% of their answers. German-speaking children also made case errors, number agreement errors between the subject and the verb and used as well other strategies to form questions. Similar findings hold for the production of *which*-questions in Dutch: 6 to 7 year-old children produced more passive questions (55%) than object questions (24%) in an elicitation task (Schouwenaars et al. 2014). Taken together, these findings reinforce the presence of the subject-object asymmetry also in the production of *which*-questions. The fact that children replace object *which*-questions with other strategies is indicative of their difficulties with object *which*-questions and these are reflected as avoidance in production.

The difficulties reported for children's comprehension and production of *which*-questions have been linked to the feature similarity between the displaced object and the subject that it crossed and which can hinder the proper assignment of thematic roles to the two noun phrases in the sentence (Friedmann et al. 2009).

- (3)    *wh* +NP                    D +NP                    <*wh* +NP>  
       Which employee did the manager admire <which employee>?

In the case of *which*-questions, this similarity is determined by the presence of a lexical N feature on both the *wh*-object and the intervening subject, as schematized in (3), which leads to intervention effects similar to those present in adult grammars and captured by Relativised Minimality/RM (Rizzi 1990, 2004). RM can be defined as follows: given a configuration like

X... Z... Y

a local relation cannot be established between X and Y if

- i. Z structurally intervenes between X and Y
- ii. Z matches the specification of X in relevant morphosyntactic features

where relevant morphosyntactic features are features triggering syntactic movement (Rizzi 2013, Starke 2001; see also Friedmann et al. 2009, Belletti et al. 2012 for application of the featural intervention account to child acquisition).

Various studies investigating intervention effects in the acquisition indicate that these effects are selective and mediated by the grammar. In other words, intervention effects can be weakened in the presence of a mismatch in morphosyntactic features between the moved object and the subject (Adani et al. 2020, Belletti et al. 2012, Bentea et al. 2016, Bentea and Durrleman 2022). However, Belletti et al. (2012) have argued that only certain features are taken into account for the computation of the A'-dependency, namely those features that are attractors of phrasal movement. Number is one such feature and a mismatch in number features between the *wh*-object and the intervening subject has been shown to facilitate children's comprehension of A'-dependencies (Adani et al. 2020, Bentea and Durrleman 2021). On the other hand, Metz et al. (2012) found no effect of number mismatch for the comprehension of *wh*-questions in 5-year-old Dutch children. In a recent study on the comprehension of *which*-questions in 5-year-old Romanian monolingual children, Avram and Sevcenco (2020) report better performance for questions with a match in number between the subject and the object compared to questions with a mismatch in number between the two constituents. Moreover, while children displayed similar performance for object *which*-questions with or without a number mismatch, they had more difficulties with subject *which*-questions in the number mismatch condition.

In this paper I take a closer look at the effect of the number feature and its role in modulating intervention effects in the acquisition of *which*-questions by investigating the production of *which*-questions in Romanian monolingual children, comparing it to the production of adults. By employing an elicited production experiment, the study looks at the impact of number mismatch on the production of subject and object *which*-questions and addresses the following research questions:

- (i) Does a subject-object asymmetry surface as well in the production of *which*-questions in Romanian?
- (ii) Does a mismatch in number modulate this asymmetry?

This investigation thus complements the comprehension study carried out by Avram and Sevcenco (2020) and helps get a more complete picture of how various features are exploited during acquisition.

The remainder of this paper is organized as follows: Section 2 briefly describes the properties of *wh*-questions in Romanian and relevant findings for the acquisition of *wh*-questions in Romanian speaking-children. Section 3 presents the elicited production task used with both children and adults. Section 4 describes and analyses the results. In section 5, I discuss the findings against the background of the featural intervention account to children's acquisition of A'-dependencies, as defined in Friedmann et al. (2009) and subsequent work. Section 6 concludes the paper.

## 2. *Wh*-questions in Romanian: properties and findings from acquisition

Subject and object questions in Romanian can be introduced by *cine* ‘who’, *ce* ‘what’ and *care* ‘which’. Several properties distinguish *cine* and *care* *wh*-phrases in Romanian: (i) while *cine* can only refer to animate entities and *ce* to inanimate entities, *care* can take both animate and inanimate referents; (ii) *cine* is inherently masculine singular, *care* is not specified for gender or number; (iii) *cine* is non-D-linked, *care* is D-linked (Pesetsky 1987, Comorowski 1996). D-linked *wh*-phrases (e.g. *which employee*) have been described as implying the existence of a contextually determined set of entities that is saliently shared by the speaker and addressee and from which the speaker is asking for a choice (Pesetsky 1987, 2000, Comorowski 1996). Non-D-linked interrogatives carry no such implication. The *wh*-phrase is always adjacent to the verb and the subject can only appear in a post-verbal position in object *wh*-questions, which leads to a similar word order (NP-verb-NP) in both subject and object *wh*-questions. These are distinguished by the presence of an overt Accusative case marker *pe* preceding the *wh*-object:

- |     |   |                                |
|-----|---|--------------------------------|
| (4) | Cine admiră managerul?<br>who admires manager-the<br>‘Who admires the manager?’   | subject <i>who</i> -question   |
| (5) | Pe cine admiră managerul?<br>PE.ACC who admires manager-the<br>‘Who does the manager admire?’   | object <i>who</i> -question    |
| (6) | Care angajat admiră managerul?<br>which employee admires manager-the<br>‘Who admires the manager?’                                      | subject <i>which</i> -question |
| (7) | Pe care angajat îl admiră managerul?<br>PE.ACC which employee CL.3SG.M admires manager.the<br>‘Which employee does the manager admire?’ | object <i>which</i> -question  |

In addition to the presence of the differential case marker *pe*, object *care*-phrases are obligatorily doubled by a clitic, while this is ungrammatical in object *cine*-questions. As Avram and Sevcenco (2020) point out, the presence of an extra dependency between the clitic and the object in *care*-questions makes the structure computationally more costly and can result in comprehension difficulties compared to object *cine*-questions.

Turning now to the acquisition of *wh*-questions in monolingual Romanian children, most of the existing studies have focused on comprehension (Bentea 2016, 2017, Avram and Sevcenco 2020). These studies report that Romanian-speaking children aged 4 to 6 comprehend *who*-questions very well, with no subject-object asymmetry surfacing for these structures. This asymmetry is nonetheless present with *which*-questions, suggesting that the presence of the overt Accusative case marker *pe* does not alleviate the intervention effects associated with these structures. This follows from the featural intervention account,

according to which case should not be taken into account in the computation of the A'-dependency and cannot be used to overcome intervention effects because it is not an attractor for phrasal movement (Friedmann et al. 2017). As pointed in section 1 above, only features that trigger movement and which are part of verbal inflection count for intervention.

To my knowledge, only Măniță (2016, 2017) analyzed the production of subject and object *who* and *which*-questions on the basis of both longitudinal and experimental data. According to Măniță (2016, 2017), Romanian children produce more subject than object *who* questions until age 3, but this difference levels off by age 4, as revealed by the analysis of four longitudinal corpora. The results of an elicitation study contrasting the production of subject and object *who* and *which*-questions in children aged 3 to 6 (Măniță (2017) reveal that they find it easy to produce *who*-questions, but struggle with the production of *which*-questions and that this difficulty with *which*-questions is also present for subject questions in the younger 3- and 4-year-olds.

In the present study, I investigate the production of subject and object *which*-questions with and without number mismatch in Romanian children and adults in order to better understand how the acquisition of *wh*-questions develops over time, how it compares to comprehension and whether a mismatch in number features between the subject and the object impacts can potentially facilitate production of *which*-questions.

### 3. An elicited production study of *which*-questions in Romanian

#### 3.1 Participants

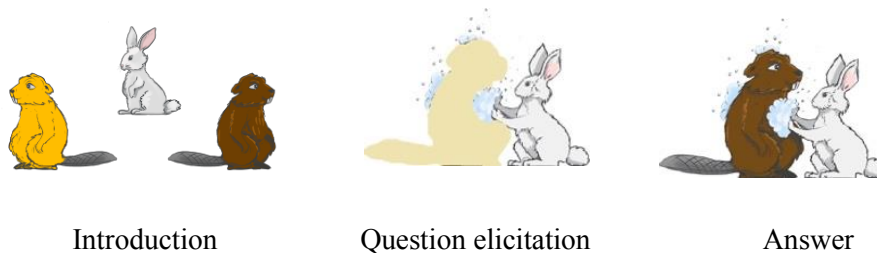
30 Romanian-speaking children (age range 6;4–10;4,  $M = 7;11$  years,  $SD = 13.9$  months, 19 girls) and 27 adult native speakers of Romanian (range: 20–35 years) were recruited for this study. Children were recruited from one school in northern Romania. A short language background questionnaire completed by parents indicated that all children were typically-developing and also exposed to one or two foreign languages at school. Parents gave written informed consent for their children's participation in the study. The adult group was recruited online and consisted mainly of university students from different regions of Romania.

#### 3.2 Stimuli

I conducted a question elicitation task based on the Diagnostic Evaluation of Language Variation test (Seymour et al. 2003) in order to assess children and adults' production of subject and object *which*-questions, with or without a mismatch in number. The study thus manipulated two factors, each one comprising two levels: question type (*subject*, *object*) and number (*match*, *mismatch*). Participants were tested on four conditions, summarized in Table 1.

**Table 1. Experimental Design**

Question Type	Number	Example of elicited question / condition
Subject	match	(8) Care castor spală iepurele? which beaver washes rabbit.the 'Which beaver is washing the rabbit?'
	mismatch	(9) Care castori spală iepurele? which beavers wash rabbit.the 'Which beaver is washing the rabbit?'
Object	match	(10) Pe care castor îl spală iepurele? PE.ACCwhich beaver CL.3SG.M washes rabbit.the 'Which beaver is the rabbit washing?'
	mismatch	(11) Pe care castori îi spală iepurele? PE.ACCwhich beavers CL.3SG.M washes rabbit.the 'Which beavers is the rabbit washing?'



**Figure 1.** Sample item associated with an object question with number match in the elicitation task.<sup>1</sup>

Each item was associated with a sequence of three pictures (Figure 1). The first picture introduces the characters. Two of the characters are of the same kind, but have different colours (e.g. two beavers, one yellow and one brown), in order to make the use of a *which*-question felicitous in the experimental setting. The second picture shows the action, but the character corresponding to the referent of the *which*-word (either the agent or the patient of the illustrated action) appears covered on the screen. This is done so that participants can see which type of character is involved in the action, without knowing which one it is. The experimenter then prompts them to ask a *which*-question. Once participants ask the question, the third picture, showing the answer, appears on the screen. Each participant was tested on 32 test items (see Table 1 for examples of test items). These were preceded by 2 practice items and interspersed with 16 filler items.

(12) *Introduction:*

Iată un iepure, un castor galben și un castor maro.

'Here are a rabbit, a yellow beaver and a brown beaver.'

<sup>1</sup> The images are intellectual property of the EU-funded project ProHeritageSpeakers (Marie Skłodowska-Curie grant agreement No 101026216).

*Question elicitation:*

Aici este vorba de spălat. Dacă îmi pui întrebarea corectă, îți arăt răspunsul.  
 ‘Here it’s about washing. If you ask me the right question, I’ll show you the answer.’

*Answer:*

Vezi? Iepurele spală castorul maro.  
 ‘The rabbit is washing the brown beaver.’

The characters used involved either pairs of animals or pairs of humans. All the verbs were transitive and for half of the items, plural agreement was audible on the verb. All the items were divided into 4 lists using a Latin-square design and children and adults were randomly assigned to one of the four lists such that each participant was tested on 8 items per condition and only saw one item once.

**3.3 Procedure**

Both children and adults were tested individually over Zoom during a session that lasted approximately 20 to 30 minutes. The session began with a familiarization phase in which the researcher explained the task and then presented the practice items in order to ensure that participants understand the procedure. Visual stimuli were displayed through a PowerPoint presentation, while the sentence prompts were presented verbally by the researcher. Given that the task was run over Zoom, the verbal presentation of the stimuli was chosen over a pre-recording of the sentence prompts to make sure that participants, especially children, interacted with the researcher and to give the task more of a game feeling. The experimental sessions were recorded on the researcher’s computer (prior consent for this was obtained for each participant) and the audio files subsequently transcribed.

**4. Results****4.1 Coding and Scoring**

All audio recordings were transcribed by two native speakers of Romanian. Responses were first scored for correctness. Responses were considered correct when they matched the elicited structure (i.e. subject or object question) irrespective of the *wh*-word used. Correct responses were then categorized into target and non-target. An answer was coded as target answer when it matched the syntactic structure that was being elicited (subject or object question) and was introduced by a *which*-phrase. Non-target answers included subject and object questions introduced by *who* or *what*, in which the correct Agent/Patient-role distribution was preserved. Incorrect responses consisted of grammatical subject and object questions in which the theta-role distribution was reversed as compared to the target question, as well as other types of questions (e.g. *why*-questions) or random responses.

Thus, children and adults' responses were classified into three categories: correct target answer, correct non-target answer, and incorrect. Examples for each of these produced answers are given below (the number in parenthesis indicates the age of the child who produced that specific answer):

Correct target answer

- (13) Pe care castor îl spală iepurele? (C1, 6;7)  
 PE.ACC which beaver CL.3SG.M washes rabbit.the  
 'Which beaver is the rabbit washing?'

Correct non-target answer

- (14) Care castor este spălat de iepure? – *passive subject question* (C2, 7;3)  
 which beaver is washed by rabbit  
 'Which beaver is being washed by the rabbit?'
- (15) Pe cine spală iepurele? – *object who-question* (C3, 7;0)  
 PE.ACC who washes rabbit.the  
 'Who is the rabbit washing?'
- (16) Ce castor spală iepurele? – *what-question (ambiguous)* (C4, 9;8)  
 what beaver washes rabbit.the  
 'What beaver is the rabbit washing?'
- (17) Pe ce castor (îl) spală iepurele? – *object what-question* (C5, 7;4)  
 PE.ACC what beaver (CL.3SG.M) washes rabbit.the  
 'What beaver is the rabbit washing?'

Incorrect answer

- (18) Îl spală. – *declarative sentence* (C6, 6;8)  
 CL.3SG.M washes  
 'Washes him.'

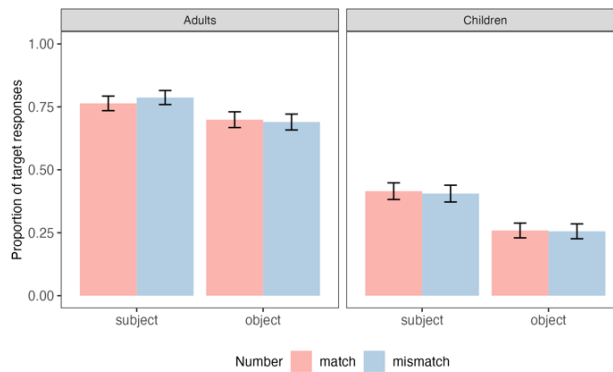
#### 4.2 Results

Table 2 summarizes the number and type of answers (*correct target* vs. *correct non-target* vs. *incorrect*) that children and adults produced for subject and object questions alike. We see that children and adults produce a high number of correct responses, both target and non-target (1728 correct answers out of a total of 1748 produced answers). Given the high rate of overall correct responses compared to incorrect responses, an analysis contrasting all correct responses versus all incorrect ones could not be performed.

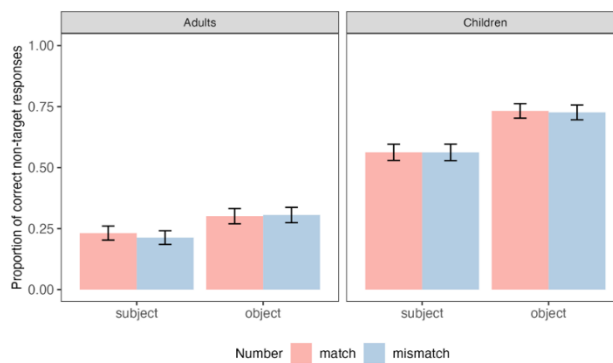
**Table 2. Total number of produced responses per group and type of answer**

Group	Question Type	Total responses	Correct target	Correct non-target	Incorrect
Adults	subject	432	335	96	1
	object	432	300	131	1
Children	subject	441	181	248	12
	object	443	114	323	6

A first analysis was therefore done comparing target and nontarget responses per group and per condition (i.e. Question Type and Number). Figures 2 and 3 present the distribution of correct target and correct non-target answers, respectively, per group and per condition (i.e. Question Type and Number) and show that adults produce more correct target answers than children, and that both groups give more correct target answers for subject compared to object questions.



**Figure 2.** Mean of correct target answers for each question type (subject vs object) as a function of number match and mismatch in children and adults. Vertical bars indicate the standard error to the mean.

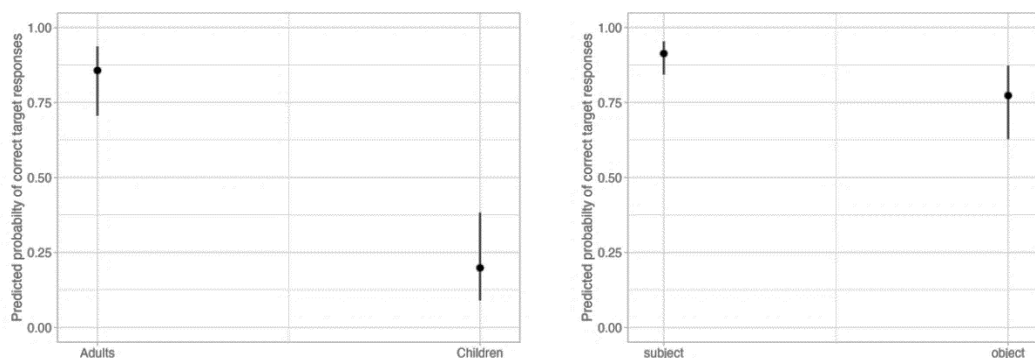


**Figure 3.** Mean of correct non-target answers for each question type (subject vs object) as a function of number match and mismatch in children and adults. Vertical bars indicate the standard error to the mean.



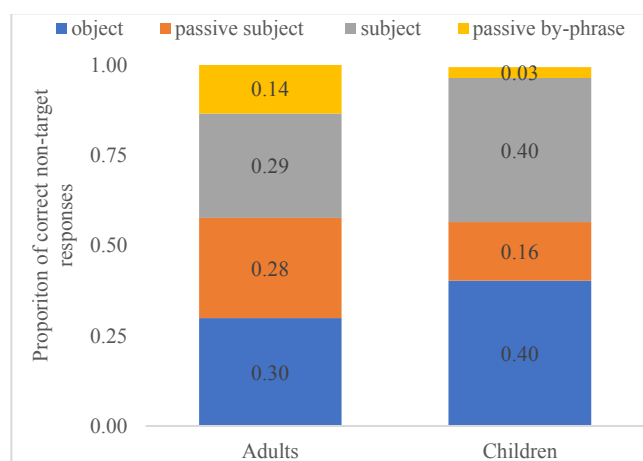
Due to the binary nature of the response variable (target vs non-target), the data was analyzed using a generalized linear mixed effects regression (GLMER) model with Group (Children vs. Adults), Question Type (subject vs. object) and Number (match vs. mismatch) and their interaction as fixed factors. The fixed factors were coded using repeated contrasts, which test neighboring factor levels against each other (Schad et al., 2020). The random effect structure included by-participant and by-item random intercepts. All models were implemented with the *lme4* package (Bates et al., 2015) in the R environment (R Core Team 2022). The bobyqa optimizer in the *glmer* function was chosen to sustain model convergence. The model was built by adding the maximal random and fixed variable structure and then removing predictors in a step-by-step procedure. The final model included both by-participant and by-item random intercepts, as well as by-participant random slopes for Question Type. The fixed factors and/or their interactions were kept in the model only if they significantly improved the model fit, which was checked against the Akaike Information Criterion scores (AIC, Akaike 1974). The final model had an AIC of at least 2 scores lower than the other models. Model comparison was carried out using one-way ANOVAs. Figures were created using the *ggplot* package (Wickham 2016) and post-hoc pairwise comparisons were implemented using the *emmeans* package (Lenth 2023).

The final model that best fit the data had the following formula:  $\text{targeted\_answer} \sim 1 + \text{Group} + \text{Question Type} + (1 + \text{Question Type} \mid \text{Participant}) + (1 \mid \text{Item})$ . Figure 4 shows the visualization of the fixed simple effects. The model yielded a significant effect of Group, indicating that children give overall fewer target answers than adults ( $\beta = -3.186$ ,  $SE = 0.637$ ,  $z = -5.005$ ,  $p < 0.001$ ), as well as a significant effect of Question Type ( $\beta = -1.129$ ,  $SE = 0.272$ ,  $z = -4.144$ ,  $p < 0.001$ ) with object questions leading to significantly fewer target responses than subject questions. The effect of Number was not significant and there were also no significant interactions. The final model accounted for 74% (Marginal  $R^2$  (fixed effects) = 0.23; Conditional  $R^2$  (total) = 0.74) of the variation in the total 1748 observations over 55 participants. I also ran an additional model for only on the child data in order to test for effects of age on the production of target responses, however age did not have a significant effect on children's production of target responses ( $\beta = 0.152$ ,  $SE = 0.990$ ,  $z = 0.153$ ,  $p = 0.878$ ), indicating that both 6-to-7 year-old and 8-to-9 year-olds produce subject and object *which*-question at similar rates and that the older children in this study are not significantly more likely to produce *which*-questions compared to other question types.



**Figure 4.** Visualization of predicted probabilities of correct target answers per fixed effects (Group and Question Type).

To recall, correct target answers comprise only subject and object questions introduced by a *which*-phrase that have the same form as the expected answer (see examples in (8) to (11) above). Correct non-target questions displayed different kinds of structures, both in children's and in adults' production. The different structures that the participants produced represent grammatical strategies that speakers use when they have to produce a question. Thus, questions introduced by a *which*-phrase, but containing a passive structure, were classified as correct non-target as long as they preserved the correct Agent/Patient thematic structure of the verb. Other correct non-target answers included subject and object questions introduced by *who* or *what*-phrases. Figure 3 above indicates that object questions generated more non-target responses than subject questions and that children produced correct non-target subject questions in 56% of the total number of produced questions and correct non-target object questions in 73% of instances. Zooming in on the correct, but non-target, answers that participants produced, we can observe the distribution of these answers by type of question (Figure 5) and type of *wh*-phrase used (Figure 6).

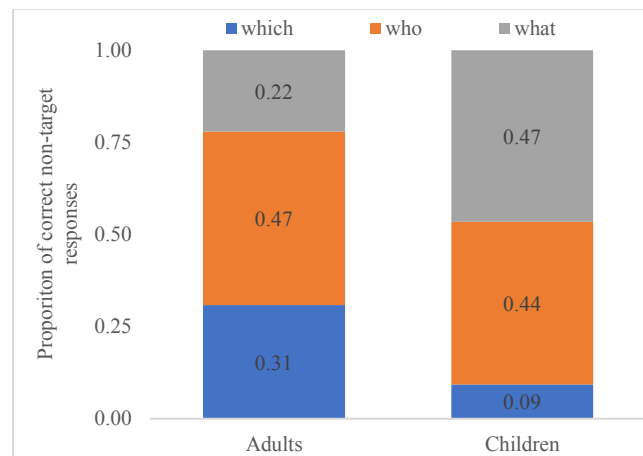


**Figure 5.** Proportion of correct non-target answers by question type in children and adults for subject and object questions combined. The proportion of each type of question is calculated from the total number of correct non-target answers per group.

The distribution in Figure 5 indicates that children mainly produce subject and object questions in about 40% of the cases and they only produce passive questions in 19% of the elicitation instances. These included mainly passive subject questions (e.g., questions of the type *Care castor e spălat de iepure?* / 'Which beaver is washed by the rabbit?') as well as some instances of passive by-phrase questions (*De care iepure e spălat castorul?* / 'By which rabbit is the beaver washed?'). Adults, on the other hand, produce subject and object questions, as well as passive subject questions at similar rates, but also more passive by-phrase questions compared to the children (14% vs 3%). Separate models were run for each of the four question types produced (subject, object, passive subject and passive by-phrase questions) with Group (Adults vs. Children) as fixed factor and with by-participant random intercepts as the maximal random effect structure supported by the data. These

analyses showed that children produce significantly more subject ( $\beta = 0.611, SE = 0.264, z = 2.311, p = 0.021$ ) and object non-target questions ( $\beta = 0.848, SE = 0.332, z = 2.555, p = 0.010$ ) than adults. However, children produce significantly fewer passive questions than the adult group, both when it comes to passive subject questions ( $\beta = -2.728, SE = 0.957, z = -2.849, p = 0.004$ ) and passive by-phrase questions ( $\beta = -2.618, SE = 0.917, z = -2.856, p = 0.004$ ).

Finally, when examining the type of *wh*-elements that participants use in their productions (Figure 6), *who* and *what* appear as more predominant in children's productions. When children produce non-target answers introduced by *which*, these are exclusively used with passive subject questions that children produce instead of object questions. Adults produce both passive subject and passive by-phrase questions introduced by *which*. Separate models were run as well for each of the three types of *wh*-words used in non-target correct responses (*which*, *who* and *what*) with Group (Adults vs. Children) as fixed factor and with by-participant random intercepts as the maximal random effect structure supported by the data. These analyses showed that children produce significantly fewer non-target questions introduced by *which* compared to adults ( $\beta = -3.385, SE = 0.937, z = 3.614, p < 0.001$ ). While no difference emerged between children and adults in the production of question introduced by *who* ( $\beta = 2.441, SE = 1.320, z = 1.849, p = 0.064$ ), the analysis revealed that children produce significantly more non-target questions introduced by *what* than the adult group ( $\beta = 2.130, SE = 1.121, z = 1.900, p = 0.057$ ).



**Figure 6.** Proportion of correct non-target answers by *wh*-type in children and adults for all conditions combined. The proportion of questions introduced by each type of *wh*-element is calculated from the total number of correct non-target answers produced per group.

## 5. Discussion

In this paper I investigated the production of *which*-questions in Romanian and the role of the number feature in modulating the intervention effects associated with this type of A'-dependencies. The study contrasted children's and adults' production of subject and object

*which*-questions that contained or not a mismatch in number between the subject and the object, such that in half of the conditions, children had to produce questions in which either the fronted *wh*-subject or the fronted *wh*-object were plural.

The results of the elicited production task first of all reveal that adults produce overall more *which*-questions than children. Second, a subject-object asymmetry in the production of *which*-questions surfaces in both groups, meaning that not only children, but also adults produce more subject compared to object *which*-questions. In addition, no effect of number mismatch surfaces in production, indicating that a mismatch in number does not boost children's or adults' production of subject and object *which*-questions. These findings are in line with those reported in Bentea (2016, 2017) and Măniță (2017), which also observe an asymmetry in Romanian children's comprehension and production of subject and object *which*-questions. The children included in the current study were slightly older (6-to-8-year-olds) than those in Bentea's and Măniță's previous studies. Nonetheless, no effect of age was present in the data, indicating that up until the age of 8 or 9, Romanian-speaking children favour using other strategies than *which*-questions in their productions. Adults are also not at ceiling with the production of *which*-questions, as they only produce these about 70% of the time. Adults' performance supports findings from the literature on adult sentence processing showing that *which*-questions are associated with a higher processing cost than *who*-questions (De Vincenzi 1996, Kaan et al. 2000).

These results are consistent with Friedmann et al.'s (2009) featural intervention account and corroborate the idea that it is harder for children (but also for adults) to produce object *which*-questions, which instantiate an intervention configuration, than it is to produce subject *which*-questions. As a consequence, both children and adults use other strategies to avoid the difficulty associated with object *which*-questions. Importantly, they use similar avoidance strategies, but at different rates. These include object questions introduced either by *cine* 'who' and by *ce NP* 'what NP', as well as passive subject questions (e.g. *Which beaver is washed by the rabbit?*). Children and adults also produce passive by-phrase questions (e.g. *By whom / by which beaver is the rabbit washed?*), but these are restricted only to subject questions. The choice of alternative question-formation strategies in children and adults indicates that adults use more passive constructions than children, who, in turn, prefer to produce object *who* and object *what NP*-questions. This suggests that passive structures are not without difficulty for children and that they prefer to produce constructions that lack intervention altogether or in which there is a disjunction relation between the features of the moved *wh*-object and those of the subject. This could also explain why children and adults do not produce more *which*-questions in the number mismatch condition: it could be that their production system favors disjunction over the intersection relation created by the mismatch in number.

Other findings do not receive a straightforward explanation under a featural intervention account. One is that the production of subject *which*-questions is not at ceiling, although results from comprehension studies suggest that children find subject *which*-questions as easy as subject *who*-questions and usually perform on a par with the two structures (Friedmann et al. 2008, Bentea 2017). There are, however, studies that underline the vulnerability of subject *which*-questions both for production and for comprehension. For instance, Măniță (2017) found that 3- and 4-year-old Romanian children produce fewer subject *which* than subject *who*-questions and that it is only at age 6 that children no longer

find subject *which*-questions more difficult than subject *who*-questions. Avram and Sevcenco (2020) also report that 5-year-old Romanian children have difficulties comprehending subject *which*-questions with a mismatch in number, but not subject *which*-questions containing a number match or subject *who*-questions. Thus, despite the fact that subject *which*-questions do not give rise to an intervention configuration, they seem to be less preferred in production and sometimes lead to difficulties even in comprehension. Avram and Sevcenco (2020) account for this vulnerability by extending Guasti et al.'s. (2012) interference account for the production of *wh*-questions in Italian and postulating that the copy of the moved subject (in SpecvP) can interfere in the AGREE relation between the intermediate AgrO projection and the direct object in post-verbal position. An in-depth discussion of this account is not the purpose of this paper; however, it is worth underlining that such an account has difficulties explaining why the interference of the object is selective and only emerges in the number mismatch conditions. Moreover, in the current study, children do not make agreement mistakes, when producing questions with a mismatch in number. This suggests that they have mastered number agreement, but that they opt for using other strategies for question formation even for subject questions, indicating that the complexity of the structure impacts their production.

Although structurally there are no differences between subject questions introduced by different types of *wh*-phrases in Romanian (*cine* 'who' vs. *care* 'which' NP vs. *ce* 'what' NP), when prompted to produce subject *which*-questions, children only do so in 42% of the cases, pointing to another source of difficulty associated with *which*-phrases, which I take to be rooted in its D-linked / discourse-anaphoric properties (Pesetsky 1987, 2000, Comorovski 1996). Which-phrases come with a contextual salience / familiarity presupposition and with a higher degree of specificity and this is likely to add more complexity to which-phrases, which manifests itself in less production of which-questions, even for subject questions. Goodluck (2010) also shows that D-linked subject questions "are not challenge free" (2010: 3) for comprehension and suggests that phenomena requiring access to discourse are more problematic for children. We also see from the adults' performance in this study that the difficulty with subject which-questions is not confined to child performance: adults are also not at ceiling with the production of subject which-questions. This is in line with Donkers et al.'s (2013) results of a self-paced reading task in Dutch, in which they compared *who*-questions to more restrictive *which NP* questions and to more generic *which person* questions and found that *which NP* questions were harder to process, as evidenced by a slowdown in reading times, than both *who* and *which person* questions. Donkers et al. (2013) link the greater processing difficulty of *which NP* questions to the application of a mechanism of set-restriction. For example, *which NP* is much more restrictive in the set of presupposed referents than *who* and *which person* (see also Bentea and Durrleman 2018 for similar findings for the comprehension of *wh*-questions and relative clauses in French).

Related to this is the finding that children also produce questions introduced by *ce* 'what' NP in 47% of their overall correct, but non-target, productions. Both *ce* 'what' NP and *care* 'which' NP are lexically-restricted, but differ in their pragmatic properties. As Caponigro and Fălăuș (2023) demonstrate, *care* 'which' NP in Romanian is strongly presuppositional and its set of referents must have been clearly introduced in the discourse such that the construction becomes equivalent to the partitive construction *care dintre* 'which of' NP (Comorovski 1996). Indeed, both children and adults in this study also

produced in a few instances questions introduced by *care dintre NP* ‘which of the’ (e.g. *Care dintre lupi îl mușca pe cal?* / ‘Which of the wolves is biting the horse?’). *ce* ‘what’ *NP*, on the other hand, has no presuppositional requirement (Caponigro and Fălăuș 2023). The distinction between *ce* ‘what’ *NP* and *care* ‘which’ *NP* is described by Dobrovie-Sorin (1994) in terms of restriction: while *care* ‘which’ *NP* is “restricted” (or “strong”), *ce* ‘what’ *NP* is “unrestricted” (or “weak”). Therefore, the fact that children produce *ce* ‘what’ *NP* instead of *care* ‘which’ *NP* structures brings further support to the idea that less set-restrictive elements can help circumvent intervention effects (Bentea and Durrleman 2018) and it also implies that the requirement for disjunction, as suggested above, is not what guides children’s productions of *which*-questions in this task. Rather, it could be that children prefer to be less specific. Another potential explanation for children’s use of *ce* ‘what’ *NP* instead of *care* ‘which’ *NP* question could be linked to the absence of the clitic in *ce* ‘what’ *NP* questions, which could make the structure computationally more costly. However, if this were the case, then children would be more likely to produce *ce* ‘what’ *NP* questions in the object conditions. This is not, however, what their productions show, as children also use *ce* ‘what’ with subject questions. In addition, some children also produce clitics in these questions, suggesting that their difficulties do not necessarily lie in creating the extra dependency between the *wh*-phrase and the clitic.

## 6. Conclusion

These results contribute new data to the general acquisition picture of *wh*-questions in Romanian monolinguals. The study examined the production of subject and object *which*-questions with or without a mismatch in number using an elicited production task with children and adults. The data show that the subject-object asymmetry previously attested for the comprehension of *which*-questions is also found in production, as both children and adults produce more subject than object *which*-questions. This is in line with the featural intervention account (Friedmann et al. 2009) and shows that intervention configurations such as object *which*-questions pose more difficulties for children. In contrast, the finding that neither children nor adults are ceiling with subject *which*-questions and that children also produce *ce* ‘what’ *NP* questions (which are lexically-restricted, but less restrictive and non-presuppositional) cannot be easily accommodated under an intervention account. I suggest that, beyond the impact of intervention, children’s production also reflect their difficulty with processing more specific or more set-restricted constituents and that they opt for less set-restricted (less specific) elements when prompted to produce *which*-questions.

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