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CONTENTS

A R T I C L E S

R E V I E W S

PREDICATE DOUBLING IN ROMANIAN

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Abstract: The current paper analyzes Romanian predicate doubling, a construction that features topicalization of a non-finite form, a supine, that surfaces either as a bare verb or as a vP complete with arguments and adjuncts and is immediately followed by a clausal structure whose fully inflected tensed verb is the lexical copy of the supine. Predicate doubling occurs in a large variety of languages and has been used in syntactic research to support various theoretical accounts such the multiple copy theory of movement developed in Nunes (2004) or late adjunction of the arguments of the fronted predicate (Landau 2007), to name just a few. I argue for a base generation account of Romanian predicate doubling, drawing upon the framework implemented in Muñoz Pérez & Verdecchia (2022). This framework takes into consideration information structure and the way in which discourse develops by answering relevant questions under discussion.

Keywords: predicate doubling, Romanian, topicalization, movement, base generation

1. Introduction

The current study[1] focuses on discussing the syntactic and discourse-related (information structure) properties of Romanian verbal predicate doubling, illustrated in (1a-b) below, and on providing a theoretical account for this type of construction that rejects a derivation resulting from syntactic movement (based on multiple copy spell-out à la Nunes 2004) and argues instead for a discourse-framed explanation as outlined in Muñoz Pérez & Verdecchia (2022).

Predicate doubling, also known in the literature as predicate clefting, is found in a variety of languages: Spanish (Vicente 2009), Brazilian Portuguese (Bastos Gee 2009), Italian (Maiden & Robustelli 2007), Russian (Abels 2001, Aboh & Dyakonova 2009), Bulgarian (Karagjosova & Jasinskaja 2015), Polish (Bondaruk 2009), Yiddish (Cable 2004) and Hungarian (Ürögdi 2006). It involves topicalization of a non-finite verbal predicate, i.e. a bare verb (1a) or an entire verb phrase (1b), or of an adjectival or nominal predicate (see (1c) and (1d) from Gorăscu 2005: 875). The topicalized verb phrase may be also be complete with arguments also adjuncts.

(1) a. De căutat, am căutat.
DE search-SUP have search-PTCP
'As for searching, I did (search).'

b. De căutat un restaurant bun, am căutat.
DE search-SUP a restaurant good have search-PTCP
'As for searching for a good restaurant, I did (search).'

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c. De frumoasă, e frumoasă.
of beautiful is beautiful
'As for being beautiful, she is.'
d. De șef, a fost șef toată viața.
of boss has be.PTCP boss all life-the
'As for being a boss, he's been a boss all his life.'

The paper focuses on verbal predicates and makes no claim about the pattern involving nominal and adjectival predicates. The topicalized predicate projects at least a vP, but never extends so as to include a tense phrase. In most of the languages that allow this type of verbal predicate topicalization, the topic component is lexically realized as an infinitive verb (see Spanish, Brazilian Portuguese, Russian, Polish, Hungarian and Yiddish). In Romanian, another type of untensed form, the supine, which is morphologically marked by the functional preposition *de*, replaces the infinitive. The fully inflected verb in the clause following the topicalized predicate (henceforth the IP doublet) must be the tensed copy of the topicalized supine. This indicates that predicate doubling imposes rather strict lexical identity conditions on the relevant verbs. In terms of information structure partitioning, the fronted predicate behaves as a topic and the IP doublet as comment. Quite importantly, this topic – comment order cannot be reverted. I illustrate this for Romanian (see also Pană-Dindelegan 2003, Gorăscu 2005):

(2) *Am căutat, de căutat (un restaurant bun).
have search-PTCP DE search-SUP (a restaurant good)
'*I did search for a good restaurant, as for searching.'

At the discourse level, Muñoz Pérez &Verdecchia (2022) suggest that the predicate doubling structure provides a (possible) answer to an immediate question under discussion (QUD, Roberts 1996) that has previously arisen in the preceding context, which is continously updated. Hence, example (1a) could very likely be integrated in the following conversational exchange between A and B:

(3) A: Ai căutat?
have search-PTCP
'Did you search (for it) ?'
B: De căutat am căutat (prin tot orașul).
DE search-SUP have search-PTCP (through all town-the)
'As for searching, I did search all over the town.'

Alternatively, an informative response the question in (3A) could simply be a confirmation or negation of the searching event: *Da, (am căutat*) 'Yes, I did' or *Nu, n-am căutat* 'No I didn't'. If, however, the speaker chooses to formulate an answer with predicate doubling, the listener expects to hear a continuation that sets the event of searching in contrast with an alternative event (for instance, searching vs. finding). The use of an adversative conjunction formally marks the contrast, as indicated in (4):

(4) De căutat, am căutat, dar nu am găsit.
DE search-SUP have search-PTCP but not have find-PTCP
'As for searching, I did search, but I didn't find anything.'

Predicate doubling has raised a lot of interest among syntacticians. Probably the most intriguing question has to do with why lexical identity has to hold between the verbal forms in the topic and the IP doublet. Another point currently under debate is whether it is possible to come up with a single explanation for both bare verb and phrasal vP doubling (see Antonenko 2018 for the proposal that Russian predicate doubling with bare verbs results from movement whereas phrasal vP doubling is best analyzed as base-generated).

It seems that some languages show enough empirical evidence to support a unifying movement derivation for head and phrasal predicate doubling (see, for instance, Vicente 2009 for Spanish or Abels 2001 for Russian, a.o.). Both A-bar movement and remnant movement have been invoked, but the details are not relevant here. Yet other languages do not align with the movement account, one example being Yiddish. In fact, Cable (2004) notes that Yiddish introduces a complex, even paradoxical, situation because the data seem to endorse both a movement and a base-generation analysis. More specifically, Yiddish predicate doubling shows pervasive island sensitivity, and this fact speaks in favor of movement. But, on the other hand, lexical identity effects are not strict in the language. Cable (2004) refers to the cases of loose identity as genus-species effects. He notes that genus-species effects hold on condition that a constituent in the IP doublet gives more specific information than its related constituent in the topicalized predicate. An illustration is given in (5). In (5a), the direct object of the fully inflected verb, *pike*, is a hyponym to the direct object of the fronted predicate, *fish*. Similarly, in (5b), flying to New York is a specific way in which travelling to America generally speaking can be done.

(5) a. ? Essen fish est Maks hekht. Yiddish
eat-INF fish eats Max pike
'As for eating fish, Max eats pike.'
b. ? Forn keyn Amerike bun ikh gefloygn keyn nyu-york
travel-INF to Amerike am I fly-PTCP to New York
'As for traveling to America, I have flown to New York.'
(Cable 2004: 8)

Cable (2004) admits that the sentences in (5) sound quite awkward, but he claims that Yiddish grammar licenses them nevertheless.

Considering this roughly outlined background that I have sketched so far, my goal is to integrate the Romanian data in the larger cross-linguistic picture of predicate doubling and find a suitable account for them. To this end, I begin by describing the properties of Romanian predicate doubling in section 2. First, in subsection 2.1, I lay out the descriptive data by making an inventory of the verb classes that occur in this structure and discussing the few restrictions on verb types that apply. Second, in subsection 2.2, I briefly review a previous analysis of the structure under scrutiny here offered in Pană

Dindelegan (2013). I focus on the status of the topicalized supine phrase (hanging topic versus contrastive topic) and I go over the contexts in which this topic construction occurs, laying stress on the way in which information is structured and integrated in the discourse. When possible, I draw comparisons to other languages in order to better highlight what is language specific and what is universal about the Romanian construction. Section 3 goes on to evaluate whether Romanian predicate doubling results from movement of the topicalized supine phrase to a position in the left periphery. I ultimately argue that an explanation along this line fails to capture the empirical data. Section 4 continues the discussion by introducing Muñoz Pérez & Verdecchia (2022)'s framework and subsequently laying down an account for Romanian coached in this framework. Section 5 concludes.

2. Romanian predicate doubling

2.1 The descriptive data

Pană Dindelegan (2003, 2013) and Gorăscu (2005) give an extensive descriptive presentation of Romanian predicate doubling. Pană Dindelegan (2013) mentions that topicalization of the supine form in predicate doubling characterizes standard Romanian. In contrast, in Aromanian, the topicalized predicate is an infinitive, just as in the other Romance languages that allow this structure, i.e. Spanish, Brazilian Portuguese and Italian. The construction belongs to the informal, colloquial speech register (Zafiu 2013). The supine is uninflected for number, person and gender and preceded by the preposition *de*, which Pană Dindelegan (2003) considers to be a topic marker.

Pană Dindelegan (2013) notes that no restriction holds on the type of verbs that occur in predicate doubling. In (6), I offer some examples involving a wide range of verb classes: unergative, unaccusative, modal, aspectual, state and idiomatic verbs (the examples below are Pană Dindelgan's 2013: 152):

(6) a. De lucrat, am lucrat destul. unergative
DE work-SUP have work-PTCP enough
'As for working, I worked enough.'

b. De căzut, a căzut de nenumărate ori. unaccusative
DE fall-SUP have fall-PTCP of countless times
'As for falling, (s)he fell countless times.'

c. De putut, sigur că am putut. modal
DE can-SUP surely that have can-PTCP
'As for being able to do it, I sure was.'

d. De început, am început de mult. aspectual
DE begin-SUP have begin-PTCP of long time
'As for beginning, I did begin a long while ago.'

e. De părut bine, sigur că -mi pare bine. state
DE feel-SUP good surely that CL.DAT.1SG feels good
'As for feeling happy I surely feel happy.'

f. De venit în fire mi- am venit idiomatic
DE come-SUP in sense CL.DAT.1SG have come-PTCP
din prima clipă.
from first time
'As for coming to my senses, I did come from the first moment.'

Bondaruk (2009) and Vicente (2009) note that no constraints on the verb types that occur in predicate doubling hold for either Polish or Spanish with one exception, though – the verb 'to be'. Vicente (2009: 166) rates (7) as ungrammatical because the topicalized predicate lacks referential power:

(7) *Ser, la puerta fue reparada. Spanish
be.INF the door was fix-PTCP
'As for being (done something), the door was fixed.'

Bondaruk (2009) presents a more nuanced case for Polish. She concurs that bare verb copula 'be' topicalization causes ungrammaticality (see 8), but topicalization of *be* accompanied by its predicative is perfectly acceptable (9).

(8) *Być (to) był sławny, ale już nie jest. Polish
be-INF PRT was famous but no longer not is
'As for being, he was famous but no longer is.'

(9) Być sławny (to) był ale już nie jest.
be-INF famous PRT was but no longer not is
'As for being famous, he was famous, but no longer is.'

As already hinted above, the resistance of copula and predicative *be* to topicalization has been put down to the fact that *be* is informationally light and topics must be referential. In (9), copula *be* becomes part of a referential vP, so the ban on topicalization no longer holds. Romanian behaves a little differently in this respect. Pană Dindelegan (2003: 152) gives examples with topicalized existential and bare copulative *be*:

(10) De fost, am fost destul de des.
DE be.SUP have be.PTCP quite of often
'As for having been there, I have been quite often.'

(11) De fost, am fost și eu profesor.
DE be.SUP have be.PTCP too I professor
'As for having been a professor, I have been one, too.'

However, she does point to a restriction on the tense of the inflected verb from the IP doublet, which can be only the *perfect compus* tense, as in (10) and (11). The use of any

other tense than *perfect compus* triggers ungrammaticality, as shown in (12)/(13) in which the verb carries present and imperfect inflection, respectively:

(12) *De fost, sunt răbdător.
DE be.SUP be.PRS patient
'As for being patient, I am.'
(13) *De fost, eram răbdător.
DE be.SUP be-IMPF patient
'As for being patient, I was.'

(Pană Dindelegan 2003: 152)

Pană Dindelegan (2013) accounts for this restriction by calling upon a suggestion advanced in Manoliu (1993). Manoliu (1993: 110) suggests that the past participle of *be* (i.e. *fost* 'been') that is part of the make-up of the supine phrase is perfective and can function as the topicalized part only in contexts that are temporally marked as [+Past].

At this point, it would be useful to add that Hebrew also allows doubling of existential 'be' ('be' referring to location), on a par with what we are seeing in the Romanian example (10):

(14) lihyot, Gil haya be- nyu York (aval rak xaci yom). Hebrew
be-INF Gil be-PST in New York (but only half day)
'As for being, Gil *was* in New York but only half a day.'

(Landau 2006: 41)

Thus, a look at the distribution of Romanian predicate doubling shows that the construction is mostly without specific contraints, excepting the cases in which the topicalized supine is existential or bare copulative *be*. The following subsection presents Pană Dindelegan's (2013) analysis of predicate doubling.

2.2 A previous analysis on Romanian and the current proposal

Regarding the discourse status of the topicalized supine phrase, Pană Dindelegan (2013: 243) proposes that the supine behaves like a hanging topic, "a hanging theme supine". The main supportive argument comes from the observation that the supine is prosodically and syntactically isolated. Prosodically, the topicalized predicate is followed by an intonational break with falling intonation. Pană Dindelegan (2013) takes the possibility to resume in the IP doublet the non-finite form and whatever arguments and adjuncts go with it (see 15) as an indication that the topicalized supine is (also) syntactically unintegrated.

(15) De mers la mare, merg la mare.
DE gone-SUP to seaside go-PRS.1SG to seaside
'As for going to the seaside, I will.'

However, I believe that the the topicalized supine does not behave like a hanging topic and is, in fact, a contrastive topic. First, it is generally acknowledged that hanging topics stay at the root, they cannot be embedded, as shown in (16b) with a nominal topic, *Maldive* 'the Maldives':

(16) a. Maldive, acolo aș petrece vacanța de vară.
Maldives there COND spend vacation of summer
'The Maldives, I would spend my summer vacation there.'
b. *Am mărturisit că Maldive, acolo aș petrece
have confess-PTCP that Maldives there COND spend
vacanța de vară.
vacation of summer
'*I confessed that the Maldives, I would spend my summer vacation there.'

Yet, in stark contrast, predicate doubling may occur in embedded contexts:

(17) Am jurat că de căutat, am căutat peste tot.
have swear-PTCP that DE searched-SUP have search-PTCP through everything
'I swore that as for searching, I did search everywhere.'

In fact, in this respect they behave just like topics introduced by a preposition and are therefore realized as prepositional phrases. For instance, *în Maldive/*'in the Maldives' in (18), is a topicalized PP that is not a hanging topic and occurs in an embedded context (19):

(18) În Maldive, acolo aș petrece vacanța de vară.
in Maldives there COND spend vacation of summer
'In the Maldives, I woud spend my summer vacation.'
(19) Am mărturisit că în Maldive, acolo aș petrece
have confess-PTCP that in Maldives there COND spend
vacanța de vară.
vacation of summer
'I confessed that in the Maldives, I would spend my summer vacation.'

Also, the received view holds that hanging topics are not integrated in the sentence in which they occur because they lack any kind of syntactic and morphological marking that connects them to a constituent in the respective sentence (see Fábregas 2016, a.o.). Topicalized supines, on the other hand, come with a distinct marker – the preposition *de*.

One last point that I want to bring to attention is that hanging topics never introduce new information. Topicalized supines, on the other hand, can be used to steer the conversation to a different topic – see example (20) from Pană Dindelegan (2003: 157):

(20) Am vorbit de câte și mai câte.
have speak-PTCP of how many and more how many
Dar de mâncat, ai mâncat?
but DE eaten-SUP have eat-PTCP
'We spoke of many things. But as for eating, have you eaten (anything)?'

In (20), the speaker resumes the bit of conversation (s)he previously had with the interlocutor by saying that they spoke of many things and (s)he then switches to something else, the question about eating. In doing so, (s)he sets up a contrast between talking about a lot of things and not getting to chance to eat anything so far; in this context, eating sounds like a good idea.

Considering these three arguments, I propose that the topicalized supine functions as a contrastive topic in the sense that it introduces a contrast to other entities previously accessible in discourse. Moreover, some sort of continuation of the predicate doubling construction is always expected to be made later on in discourse simply because the comparison intrinsic to the contrast needs to be further fleshed out. This is a general characteristic of predicate doubling structures, Muñoz Pérez & Verdecchia (2022) refer to it as a continuation effect, Bastos-Gee (2009) prefers the term "the but-effect".

At this point, it would also be useful to revisit the status of the preposition *de*. As mentioned in the beginning of subsection 2.1, Pană Dindelegan (2013) believes *de* to be a topic marker that surfaces in any type of predicate topicalization, not just supine topicalization, i.e. with adjectival and nominal predicates as well. This means that she lumps together *de* in (21) and in (22):

(21) De căutat, am căutat.
DE searched-SUP have searched-PTCP
'As for searching, I did search.'
(22) De priceput, e priceput.
of skilful-SUP is skilful
'As for being skilful, he IS (indeed).'

However, *de* in (21) cannot be just a topic marker. The Romanian supine may take on nominal or verbal morphology. Nominal supines co-occur with the definite article and select genitive-marked arguments. Verbal supines (the type found in predicate doubling) assume a morphological form resembling that of an invariant past participle (i.e. a participle in the default singular, masculine form) and combine with arguments that bear accusative case. The difference between nominal and verbal supines is illustrated in (23) and (24) respectively, from Hill (2002: 496). (23) shows the nominal supine *culesul* 'the gathering', derived by means of the suffix *-s* (*cules*), accompanied by the enclitic definite article *-(u)l* 'the' and selecting the genitive marked argument *porumbului* 'of the maize'; (24) features the verbal supine *de cules* 'DE gathered', preceded by *de* and selecting an accusative argument, *porumbul* 'the maize'.

(23) Culesul porumbului e din ce în ce mai greu.
gathering-the maize-GEN is from that in that more difficult
'The gathering of maize is more and more difficult.'
(24) E din ce în ce mai greu de cules porumbul.
is from that in that more difficult de gather-SUP maize-the
'It is more and more difficult to gather the maize.'

As already shown in (24), verbal supines need to be preceded by a prepositional complementizer *de* (Hill 2002, 2013). In some way, *de* is similar to the preposition *a* 'to'

that encodes non-finiteness in infinitival clauses (see also Pană Dindelegan 2005 on the similarity between these two prepositions). Consequently, *de* in the topicalized supine phrases is syntactically a complementizer.

The last aspect that I touch upon in this section concerns an inventory of the contexts in which predicate doubling occurs and a close look at the way information structure is organized, i.e. further details on the realization of topic and the type of focus found in the IP doublet. I will start with discussing the received view in this respect, as reflected in work by Pană Dindelegan (2003, 2013) and in Gorăscu (2005). Afterwards, I will offer what I consider to be a more economic and unifying perspective on the contexts under scrutiny here.

Pană Dindelegan (2003) identifies three discourse situations that feature predicate doubling: in the first two, the topicalized supine resumes previously introduced predicates and thus behaves as a discourse device that maintains topic continuity. What keeps these situations distinct is that in one case the topicalized supine resumes a declarative sentence (25), *să plece* 'to leave', and in the second, an interrogation (26), *te-a durut*? 'did it hurt?' – the resumed sequences are highlighted in bold.

(25) Și- a umblat **să plece**, el știe pe un' se umblă, da'
and has walk-PTCP SBJV leave he knows where IMPERS walks but
pân' la ormă de plecat n- a plecat.
until at end DE leave-SUP not has leave-PTCP
'And he went around, only he knows where (one usually goes around), but, as for leaving, he didn't leave in the end.'
(G. Adamești eanu, in Pană Dindelegan 2003: 155)

(26) A: **Te -a durut?**
CL.ACC.2SG has hurt-PTCP
'Did it hurt?'
B: De durut, sigur că m- a durut, dar
DE hurt-SUP sure that CL.ACC.1SG has hurt-PTCP but
nu ca să -mi dau sufletul.
not that SBJV CL.DAT.1SG give up soul-the
'As for hurting, it surely did, but it's not that I couldn't live with it.'
(Pană Dindelegan 2003: 156)

In the third context, the topicalized supine behaves differently: it breaks topic continuity by introducing a new topic – see (20) repeated for convenience as (27). But in doing so, it still contributes to setting up an opposition, a contrast between having talked about a whole lot of things, but not getting the chance to eat anything.

(27) Am vorbit de câte și mai câte,
have speak-PTCP of how many and more how many
Dar de mâncat, ai mâncat?
but DE eat-SUP have eat-PTCP
'We spoke of many things. But as for eating, have you eaten (anything)?'
(Pană Dindelegan 2003: 157)

I believe that it is of no notable theoretical consequence whether the predicate doubling construction resumes a declarative or interrogative sentence. What matters, on the other hand, is that in both the topic continuity and topic shift contexts the topicalized supine instantiates a constrative topic that resumes an immediate QUD and the IP doublet offers an answer to that question. This is, in fact, what Romanian has in common with Spanish. Muñoz Pérez & Verdecchia (2022) propose that, in Spanish the topicalized verb/vP in predicate doubling functions as a contrastive topic as defined by Büring (2003). As such, first of all it brings to attention an immediate QUD that has been implicitely (or explicitely) formulated in the preceding chunk of discourse. In addition, the topicalized verb/vP also brings up a set of alternative questions to that QUD. I will offer a more detailed discussion of Muñoz Pérez & Verdecchia (2022)'s framework in section 4.1. For the time being, to conclude this subsection, I would suggest that Romanian predicate doubling behaves similarly to its Spanish counterpart. Before elaborating on this proposal based on a discourse account, I will first determine in section 3 whether Romanian predicate doubling finds a comprehensive explanation in terms of syntactic movement of the topicalized verb/vP to a left-peripheral position.

3. Is it movement?

Pană Dindelegan (2003: 153) observes that Romanian licenses long distance predicate doubling out of complement clauses. The examples below are hers:

(28) a. De văzut, pot să vadă și ei.
DE seen-SUP can SBJV see also they
'As for seeing, they can see too.'
b. De fugit, nu se gândea să fugă.
DE run-SUP not REFL.CL.3SG think SBJV run
'As for running, (s)he didn't think of it.'

Interestingly, she also brings to attention ungrammatical examples of predicate doubling, which are, in fact island violations; (29) illustrates this point with a *wh*-island:

(29) *De ascuns, l- au găsit acolo unde s- a ascuns.
DE hide-SUP CL.ACC.3SG.M have find-PTCP there where REFL.CL.3SG has hide-PTCP
'As for hiding, they found him where he hid.'
(Pană-Dindelegan 2003: 153)

A deeper investigation into island effects confirms that Romanian predicate doubling is island-sensitive. Examples (30) and (31) show violations of a complex NP and a coordinate structure, respectively, and both are ungrammatical:

(30) a. *De angajat, umblă zvonul că angajează.
DE hire-SUP circulates rumor-the that hire-PRS
'As for hiring, the rumor that they are hiring has been circulated.'

b. *De speriat turiști, circulă știrea că
DE scare-SUP tourists circulate news-the that
îi sperie incendiile.
CL.ACC.3PL.M scare wildfires-the
'As for scaring tourists, the news that wildfires scare them has been circulated.'

(31) a. *De rezolvat, s- a informat și a rezolvat
DE solve-SUP REFL.3SG has inform-PTCP and has solve-PTCP
problema.
problem-the
'As for solving (the problem), he looked up information and solved it.'

b. *De rezolvat problema, s- a informat din
DE solve-SUP problem-the REFL.CL.3SG has inform-PTCP from
cărţi și a rezolvat. -o.
books and has solve-PTCP CL.ACC.3SG.F
'As for solving the problem, he looked up information from books and solved it.'

The data in (28)-(31) seem to reliably point to the conclusion that Romanian predicate doubling must be the result of some type of movement because it shows sensitivity to islands, i.e the complex NP and wh-islands, and ungrammaticality of extraction from a coordinate structure. But the story just does not end here, as I will try to demonstrate in the ensuing discussion.

The first point that raises concern about a potential movement derivation comes from morphological mismatches effects. Vicente (2009: 171) notes that in Spanish, the topicalized verb in predicate doubling most of the times occurs as a bare infinitive. However, if the fully inflected verb in the IP doublet is in the passive voice, the topicalized predicate must surface as a past participle, not an infinitive, and must agree in number and gender with the subject of the passive sentence – an agreement mismatch explains the ungrammaticality of (32b):

(32) a. Reparada, la puerta ha sido reparada. Spanish
fix-PTCP.SG.F the door has been fix-PTCP.SG.F
'As for being fixed, the door has been fixed.'

b. *Reparado, la puerta ha sido reparada.
fix-PTCP.SG.F the door has been fix-PTCP.SG.F

In Romanian, the topicalized predicate will always be a supine irrespective whether the verb in the IP doublet is in the passive or active voice. And the supine surfaces as an invariant, uninflected form, as already mentioned. Consequently, if the fully inflected verb is passive, no agreement holds between the supine and the subject of that passive, unlike in Spanish:

(33) a. De reparat, ușa a fost reparată.
DE fix-SUP door-the has be.PERF repair-PTCP.SG.F
'As for being fixed, the door has been fixed.'
b. *De reparată, ușa a fost reparată.
DE fix-SUP.SG.F door-the has be.PERF repair-PTCP.SG.F

(34) a. De găsit, a fost găsită în cele din urmă.
DE find-SUP has be.PERF find-PTCP.SG.F in those from last
'As for being found, it was found eventually.'
(Gorăscu 2005: 874)
b. *De găsită, a fost găsită în cele din urmă.
DE find-SUP.SG.F has be.PERF find-PTCP.SG.F in those from last

This is a first indication that the topicalized supine predicate did not initially originate in a position within the IP doublet. Additional support for this view comes from the presence of genus-species effects, similar to those reported for Yiddish (Cable 2004), Brazilian Portuguese (Cable 2004, Bastos-Gee 2009) and also for Spanish (Muñoz Pérez &Verdecchia 2022). Let us consider (35) and then, for the sake of comparison, (36) from Muñoz Pérez & Verdecchia (2022: 32):

(35) De mâncat pește, mănânc doar păstrăv.
DE eat-SUP fish eat-PRS only trout
'As for eating fish, I only eat trout.'

(36) Leer libros, leo solo novelas. Spanish
read-INF books read-PRS only novels
'As for reading books, I (only read novels).'

The narrow focus in (35) goes to the direct object *păstrăv* 'trout' which is in a hyponymy relation with the direct object in the topicalized predicate phrase, *pește* 'fish'. The same semantic relation holds between *libros* 'books' and *novellas* 'novels' in (36). Muñoz Pérez & Verdecchia (2022) suggest that for genus-species effects to be licensed, the hyponymy constraint must apply. The prerequisite for a hyponymy relation in this case dovetails nicely with Cable (2004)'s earlier observation that the constituent in the IP doublet must provide more specific information than its counterpart in the topicalized predicate.

Pană Dindelegan (2003) notes that, on occasion, in Romanian, the IP doublet need not necessarily contain a lexical copy of the supine. More specifically, she says that a verbal anaphor could resume the topicalized supine phrase. Invariably, this anaphor is the verb *a face* 'to do' preceded by the invariable unstressed clitic *o* 'it'.

(37) De redus salarii, o vor face cu siguranță.
DE cut.SUP wages, CL.ACC.3SG will do with certainty
'As for cutting down wages, they will surely do it.'

Interestingly, Pană Dindelegan goes on to say that reverting the topic-focus order produces ungrammaticality:

(38) *O vor face cu siguranță, de redus salarii.
CL.ACC.3SG will do with certainty DE cut.SUP wages

In principle, the topic-focus order cannot be reversed anyway, but, in (38), the fact that the verbal anaphor precedes its antecedent adds up to the ill-formedness of the utterance. It is worth mentioning that Brazilian Portuguese also has resumption of the topicalized infinitive by the verbal anaphor *fazer isso* 'do it' (Bastos-Gee 2009: 170):

(39) Vacinar cachorro, eu conheço um veterinário que faz isso. Portuguese
vaccinate-INF dog I know a veterinarian that does it
'As for vaccinating dogs, I know a veterinarian that does it.'

Resumption by means of a verbal anaphor gives further supporting evidence to the idea that the topicalized supine phrase did not belong in the IP doublet at the onset of the syntactic derivation and hence cannot have moved from there. Additionally, there is a fourth argument provided by the pronominalization patterns observed in predicate doubling constructions. In some cases, a DP constituent occurring in the topicalized supine phrase is resumed by a pronominal clitic form in the IP doublet. Consider, for instance, (40):

(40) De văzut pe fiica președintelui,
DE see-SUP PE daughter-the president-GEN
am văzut -o.
have see-PTCP CL.ACC.SG.F
'As for seeing the president's daughter, I did see her.'

At first blush, it seems that *fiica președintelui* 'the president's daughter', the definite, [+human] direct object DP occurring with the supine verb is clitic doubled by the singular feminine accusative clitic *o* 'her' in the IP doublet. In truth, specific [+human] direct objects are differentially object-marked in Romanian by the functional preposition *pe* and also clitic doubled (41b):

(41) a. *Am văzut fiica președintelui.
have see-PTCP daughter-the president-the
'I saw the president's daughter.'
b. Am văzut -o pe fiica președintelui.
have see-PTCP CL.ACC.3SG.F pe daughter-the president-the

The only way to derive by movement the structure in (40) would be to assume that the supine phrase initially started out in a position selected by the fully inflected verb (see (42)), possibly a big DP, as Vicente (2009) assumes for Spanish and subsequently moved to the left periphery of the IP doublet:

(42) De văzut pe fiica președintelui am văzut -o
DE see-SUP PE daughter president have see-PTCP CL.ACC.3SG.F

[am văzut- o ~~de văzut pe fiica preşedintelui~~]
have see-PTCP CL.ACC.3SG.F DE see-SUP PE daughter president

But if this is indeed so, we would predict that further extraction of any constituent belonging to the topicalized supine should be prohibited. This is actually the Freezing effect, a ban on extraction out of a phrase that has undergone syntactic movement. Consequently, we would expect (43) to be ungrammatical because the definite DP has undergone further topicalization, i.e. A-bar movement, but it is not:

(43) Pe fiica preşedintelui, de văzut,
PE daughter-the president-the DE see-SUP
am văzut- o ieri la mall.
have see-PTCP CL.ACC.3SG.F yesterday at mall
'As for seeing the president's daughter, I saw her yesterday at the mall.'

Saab (2017) gives an extensive discussion of pronominalization patterns in Rioplatense Spanish vP topicalization (predicate doubling, in fact) and argues that they match extrasentential rather than intrasentential anaphoric relations. This entails that whatever anaphoric elements happen to occur in the IP doublet will find their antecedents in the preceding discourse, more precisely, in the nominal phrases inside the topicalized verb/vP. His observation applies to clitic pronouns as well as to full pronouns and other anaphoric expressions such as epithets. Let us consider the Romanian data:

(44) Am citit- *(o) cartea.
have read-PTCP it book-the
'I read the book.'
(45) De citit cartea, am citit -o ieri.
DE read-SUP book-the have read-PTCP CL.ACC yesterday
'As for reading the book, I read it yesterday.'

The definite DP *cartea* 'the book' in (44) cannot be differentially object-marked and clitic doubled by the accusative clitic *o* 'it', it lacks the [+human] specification. This further suggests that the accusative clitic *o* 'it' in (45) is simply a pronominal anaphor that takes the DP *cartea* 'the book' as its extrasentential antecedent. Put differently, the relation between *the book* and *it* in (45) is identical to the relation between these two constituents in (46):

(46) Am văzut cartea. Am cumpărat -o imediat
have see-PTCP book-the have buy-PTCP CL.ACC immediately
'I saw the book. I bought it at once.'

The other options of anaphoric nominals with extrasentential antecedents mentioned by Saab for Spanish are also available in Romanian: see (47) for a tonic pronoun and (48) for an epithet example:

(47) De vorbit cu vecinul, am vorbit ieri cu el.
DE speak-SUP with neighbour-the have speak-PTCP yesterday with him
'As for speaking to the neighbour, I spoke with him yesterday.'

(48) De vorbit cu vecinul, am vorbit ieri cu idiotul ăla.
DE speak-SUP with neighbour-the have speak-PTCP yesterday with idiot-the that
'As for speaking to the neighbour, I spoke yesterday with that idiot.'

In (47), the pronoun *el* 'him' inside the prepositional phrase *cu el* 'with him' takes the DP *vecinul* 'the neighbour' from the topicalized supine verb as its extrasentential antecedent. The same relation holds between the epithet in (48), *idiotul ăla* 'that idiot' and the nominal *vecinul* 'the neighbour'.

The present section started out with a question regarding the feasability of a movement derivation for Romanian predicate doubling. Even if long distance doubling is allowed and sensitivity to islands seems to be in place (but see the discussion in section 4 too, in regard to islands), I have shown in this section that there are other pieces of evidence that undermine this view. They have to do with: morphological mismatch effects, genus-species effects, resumption by the verbal anaphor *a o face* 'do it' and the pronominalization pattern in predicate doubling, which has the properties of extrasentential anaphoric relations. In a nutshell, the evidence presented here points to the conclusion that movement is not tenable and that the topicalized supine phrase must be base-generated. The next section outlines an account for Romanian predicate doubling in discourse terms, following Muñoz Pérez & Verdecchia's (2022) explanation for Spanish, and sheds light on the issues of island sensitivity and genus-species effects.

4. It is base generation

4.1 The framework: Muñoz Pérez &Verdecchia (2022)

Muñoz Pérez & Verdecchia (2022) explore predicate doubling (bare verb and vP topicalization) in Spanish, decide against a movement derivation in terms of multiple copy spell-out and settle for a base-generation explanation. But they also took things a step further from assessing only the syntactic facts and set the predicate doubling construction against the discourse backdrop that contains it. This led to a discourse explanation of the structure under scrutiny.

The account makes use of the notion of contrastive topic, as defined in Büring (2003), and of the relation between constrastive topics and focus envisaged in the same work. It also draws upon the Question Under Discussion model of discourse put forth in Roberts (1996), according to which sentences represent answers to explicit or implicit questions that come up as the discourse gradually unfolds. By and large, a piece of discourse addresses what Roberts (1996) calls a Big Question (for instance, *What is the way things are?*), i.e. a question that covers multiple aspects and whose final answer(s) will settle a certain matter that has been of interest. Roberts (1996) distinguishes between

super-questions and sub-questions and proposes that the former entail the latter. Büring (2003) adopts the super-question/sub-question distinction[2] in order to advance a discourse model based on a hierarchical structure represented as a tree diagram, i.e. a discourse/D-tree. To illustrate these theoretical claims in simple, intuitive terms, let us consider an example of a Big Question given by Muñoz Pérez & Verdecchia (2022): *What is Cosmo like?* In order to explore what Cosmo is like, a sub-question, *What does Cosmo like?*, is going to be useful, and so is its answer: *Cosmo likes chicken.* More sub-questions and their answers will come up until the Big Questions gets settled, i.e. we find out what kind of guy Cosmo is. Put in general terms, in this model, the resolution of a piece of discourse arises when all the relevant sub-questions have been exhaused and have received an answer. In Büring's (2003) D-tree account, constrastive topics relate a sentence to a set of alternative questions whereas focus connects sentences to a set of alternative propositions.

Starting from the assumption that discourse chunks are built around relevant set(s) of immediate questions under discussion, Muñoz Pérez & Verdecchia (2022) propose that the topicalized predicate in predicate doubling instantiates a contrastive topic (CT) (defined as in Büring 2003) that calls attention upon an explicit or implicit immediate QUD and feeds the formulation of other sets of questions alternative to the initial QUD. More specifically, as summarized in (49) from Muñoz Pérez & Verdecchia (2022: 1176), their proposal rests on the empirical observations: (i) that the topicalized verb/vP, Predicate 1, functions as a contrastive topic and (ii) Predicate 2 marks narrow focus on a constituent inside the vP or *verum* focus on the main verb and provides answers to the relevant QUD:

(49) Predicate 1, [$_{\text{CLAUSE}}$ … Predicate 2 … X^0/XP]
contrastive topic focus

In technical terms, both the contrastive topic and the focus behave as variables. Discourse resolution arises after the application of the Constrastive Topic Formation algorithm, CT-Formation, taken over from Büring (2003: 519):

(50) a. Replace the focus with a wh-word and front the latter; if the focus marks the finite verb or negation, front the finite verb instead.
b. Form a set of questions as a result of (49a) by replacing the CT with some alternative to it.

For this algorithm to work with contrative topics realized as verbs or vPs as is the case in predicate doubling constructions, a stipulation is necessary (Muñoz Pérez & Verdecchia: 1174):

(51) If the CT-marked constituent is dislocated outside the clause, replace it with its correlate within the clause in order to form the QUD.

[2] In fact, Büring (2003) uses the terms question vs. sub-question.

The (strict or sometimes loose) lexical identity between Predicate 1 and Predicate 2 results from an additional stipulation, the Congruence Condition for Predicate Doubling, which requires that the answer in the IP doublet (lexically realized as an assertion) include Predicate 1, the predicate in the topicalized constituent (Muñoz Pérez & Verdecchia: 1180):

(52) Given a sentence with the structure in (49), there must be a question Q with PREDICATE 1 as its main predicate such that $[\![Q]\!] \subseteq [\![CLAUSE]\!]^f$.

Muñoz Pérez & Verdecchia (2022) claim that their Congruence Condition is semantic in nature, not pragmatic.

The next section offers a detailed presentation of how this discourse account of predicate doubling applies to the Romanian data.

4.2 The current proposal at work

By way of exemple, let us see how this proposal works by having a close look at (53), in which the IP doublet contains a DP marked with narrow focus/F, *rezumatul* 'the abstract':

(53) A: Ce a citit George? Cartea sau rezumatul?
'What did George read? The book or the abstract?'
B: De citit, a citit [rezumatul]$_F$
DE read-SUP has read-PTCP abstract-the
(iar cartea a lăsat -o deoparte).
and book-the has leave-PTCP CL.ACC.3SG.F aside
'As for reading, the did read the abstract (and the book, he put aside).'

By applying the CT-Formation algorithm in (50), the narrow-focused constituent in (53B) gets replaced by a wh-word, *ce* 'what' (54a), and then a set of alternative questions to the QUD in (53A) is formulated (54b) (R marks the verb variable in Muñoz Pérez & Verdecchia 2022's notation).

(54) a. [De citit], ce a citit George ⇝ Ce [a citit]$_{CT}$ George?
As for reading, what did George read? ⇝ What did George read?
b. Ce R George? ⇝ {Ce a citit George?, Ce a lăsat deoparte George? … }
What R George ⇝ {What did George read?, What did George put aside ? … }

These questions have to be at-issue in the sense of Simons et al. (2010), i.e. a proposition *p* is at-issue if *?p* deals with the QUD. While addressing the question (53A), B leaves room for the alternative relevant QUD *Ce a lăsat George deoparte*? What did George put aside?' with the possible answer *A lăsat deoparte cartea* 'He put aside the book'. This alternative gives rise to the continuation effect that characterizes predicate doubling.

And now, let us see what happens when the focus part gets the *verum* focus (capitalized) interpretation as in (55):

(55) A: A citit George rezumatul?
'Did George read the abstract?'
B: De citit rezumatul, l- a CITIT.
DE read-PTCP abstract-the CL.ACC.3SG.N has read-PTCP
'As for reading the abstract, he DID read it.'

Following CT-Formation, the finite verb gets fronted (56a) and then the predicate in the CT gets replaced by alternatives (56b) – P marks the predicate variable:

(56) a. [De citit rezumatul]$_{CT}$, l-a CITIT ⇝ [A citit rezumatul]$_{CT}$ George?
'As for reading, he did read it ⇝ Did George read the abstract?'
b. P George? ⇝ {A citit rezumatul George?, A răsfoit cartea George? … }
'Did George P? ⇝ {Did G. read the abstract?, Did G. browse the book? … }

In this case, the predicate doubling structure provides an answer to the QUD: *A citit George rezumatul* 'Did George read the abstract?' Further on, other questions with other verbs that alternate with that signalled by the topicalized predicate will be formulated: *A frunzărit George rezumatul* 'Did George browse the abstract? or *A înțeles George rezumatul* 'Did George understand the abstract?', etc.

The presence of island effects gets an explanation based on the Congruence Condition in (52). In Muñoz Pérez & Verdecchia's (2022) framework the presence of island effects is not to be traced back to syntactic reasons. Instead, they are triggerd by a disruption in discourse. Island structures disobey the Congruence Condition. The assertions embedded in them provide answers to irrelevant, contextually inappropriate QUDs and this leads to a pragmatic crash in discourse. To see how this works out for Romanian, consider the *wh*-island violation in section 2, i.e. example (29), repeated for convenience as (57):

(57) *De ascuns, l- au găsit acolo
DE hide-SUP CL.ACC.3SG.M have find-PTCP there
unde s- a ascuns.
where CL.REFL has hide-PTCP
'As for hiding, they found him where he hid.'

The Congruence Condition requires that (57) answer a QUD that is about hiding and has *hide* as predicate. Hence, the QUD should be something like: *S-a ascuns?* 'Did he hide?' The relevant, at-issue answer is the proposition *p S-a ascuns* 'Yes, he did hide', or *Nu s-a ascuns* 'No, he didn't hide'. Instead, a second, irrelevant QUD cuts in: *'Did they find him?*', followed by an irrelevant answer *'They found him where he hid'*:

(58) ⟦S-a ascuns? ⟧ ⋤ ⟦L-au găsit unde s-a ascuns⟧^{f}
'Did he hide? They found him where he hid.'

This account makes an interesting prediction. Namely, if the main clause that introduces the island gets a paranthetical interpretation, the ungrammaticality associated with the island disappears. To this extent, Muñoz Pérez & Verdecchia (2022: 1186) discuss the case of main clauses whose verbs function as evidential makers, like *hear*, and which introduce a complex NP island:

(59) A: ¿Qué compró el vecino? Spanish
'What did the neighbor buy?'
B: Escuché el rumor (de) que compró una Ferrari.
heard the rumour of that bought a Ferrari
'I heard the rumor that he bought a Ferrari.'

The verb *hear* behaves as an evidential marker because it identifies the speaker as the the source that offered the information expressed in the complement clause *he bought a Ferrari*. Example (59) features a case in which well-formedness is not compromised because the main clause *I heard the rumour* functions as a paranthetical element. In this framework, a paranthetical is a structure which does not contain the main point of discourse; in fact, the main point is made in the embedded clause. Put differently, the real at-issue answer in (59) is given in the island-embedded IP doublet.

This type of repair strategy smoothes out the island effects I discussed earlier in regard to Romanian. Consider (60):

(60) A: Se mai angajează la stat acum? Guvernul reduce drastic cheltuielile?
'Is the state still hiring now? Is the government cutting down dramatically on expenses?'
B: De angajat, am auzit zvonul că se angajează.
DE hire-SUP have hear-PTCP rumour-the that IMPERS hire
'As for hiring, I heard the rumour that they are hiring.'

In (60B) there is a complex NP island which embeds the at-issue answer to the first QUD, *Se angajează la stat?* 'Is the state still hiring now?'. To me, (60B) does not sound ungrammatical. To futher flesh out the preceding discourse, I also introduced a second QUD – *Guvernul reduce drastic cheltuielile?* 'Is the government cutting down dramatically on expenses?' – which is supposed to get an answer later on in discourse, i.e. *Da, se vor reduce drastic cheltuielile* 'Yes, they will cut down on expenses dramatically', for instance.

The pattern with resumption by the anaphoric verbal expression *a o face* 'do it' finds a trivial account in this framework as well. See (37) repeated for convenience as (61):

(61) De redus salarii, o vor face cu siguranță.
DE cut-SUP wages CL.ACC will do with certainty
'As for cutting down wages, they will surely do it.'

The QUD that the predicate doubling structure in (61) answers is *Are they going to cut down wages?* The IP doublet *o vor face cu siguranță* 'they will surely do it', makes a

reasonable, at-issue answer to this QUD; the absence of lexical identity between *a reduce* 'to cut down' and *a o face* 'to do it' is not a problem because the invariant anaphoric clitic *o/it* can resume topicalized supine predicates.

It also looks like anaphoric resumption by *a o face* 'to do it' works fine in islands as well. The example (39) provided by Bastos-Gee (2009: 170) for Portuguese, repeated here as (62), clearly indicates this. The immediate QUD should be: *Do they vaccinate dogs?* The main clause, *I know*, functions as an evidential, it asserts the speaker's claim about the reliability of the information source. This allows the main point of discussion to be settled in the embedded relative clause, i.e. the answer to the QUD, *yes, a veterinarian vaccinates dogs* follows in the relative clause.

(62) Vacinar cachorro, eu conheço um veterinário que faz isso. Portuguese
vaccinate-INF dog I know a veterinarian that does it
'As for vaccinating dogs, I know a veterinarian that does it.'

The ungrammatical Romanian examples with 'be' topicalization could also be explained along similar lines. Have a look at (12) and (13) repeated here as (63) and (64):

(63) *De fost, sunt răbdător.
DE be.SUP be-PRS patient
'As for being patient, I am.'
(64) *De fost, eram răbdător.
DE be.SUP was-IMPF patient

(Pană Dindelegan 2003: 152)

The QUD that the topicalized supine in (63) calls attention on is *Were you patient?* and it is anchored in the past. Therefore, an answer with the verb in the present *Sunt răbdător* 'I am patient' is not particulary adequate[3]. Nor is an answer with an imperfective verb *Eram răbdător* 'I used to be patient'. This explanation fits with Manoliu's (1993) insight that the past participle that goes into the morphological make-up of the supine is compatible only with [+Past] contexts. Something similar goes on in (64).

The last point that I want to bring up concerns genus-species effects like (35), repeated as (65):

(65) De mâncat pește, mănânc doar păstrăv.
DE eat-SUP fish eat-PRS only trout
'As for eating fish, I only eat trout.'

[3] One reviewer asked about the other possible QUDs, such as *Ești răbdător* 'Are you patient?' or *Erai răbdător* 'Did you use to be patient?'. To my mind, in the case of the first QUD, with the verb in the present, an answer like *De fost răbdător, am fost* 'As for having been patient, I was' sounds odd because its reference is set to past. I would opt in this case for an answer involving a topicalized adjectival predicate, i.e. *De răbdător, sunt răbdător* 'As for being patient, I am'. Regarding the second QUD, I would go for the same choice with a topicalized AP: *De răbdător, eram răbdător* 'As for being patient, I used to be'. Further study of this issue will definitely be necessary and useful.

Muñoz Pérez & Verdecchia (2022) suggest that, in this case, the IP doublet offers a coherent answer to the QUD instantiated in the topicalized predicate simply because a hyponymy relationship holds between the internal arguments of the topicalized and the fully inflected predicate, respectively, i.e. *păstrăv/'trout'* has the properties of *fish*, and it brings an additional specification about the type of fish.

To conclude so far, I have shown in this section an alternative account of Romanian predicate doubling, which is not based on syntactic movement, is tenable. Base generation of the topicalized supine verb phrase coupled with sensitivity to discourse contraints can very well account for Romanian predicate doubling. I also raised the issue that island effects may be illusory in Romanian as well, following Muñoz Pérez & Verdecchia's (2022) suggestion (restricted to Spanish) that they are, in fact, caused by disruptions in the coeherence of discourse. Last, I have pointed out that the genus-species effects observed for Romanian also find an explanation in terms of semantic restrictions, i.e. the hyponymy relation.

5. Conclusions

This paper has offered a presentation and discussion of Romanian predicate doubling, a construction that occurs most frequently in the colloquial register of the language and consists of a topicalized supine verb (bare verb, or a verb accompanied by arguments and adjuncts) followed by a fully inflected clause whose verb is lexically identical to the supine form. Even if it might be tempting to use this construction as evidence for the multiple copy theory of movement, as it has been done for predicate doubling in other languages, like Spanish (Vicente 2009), Polish (Bondaruk 2009), and Russian (Abels 2001), to name just a few, the empirical evidence from Romanian speaks against it. First, I reviewed this evidence and established that the presence of morphological mismatches effects, genus-species effects, the possiblity to resume the topicalized non-finite verb by means of the verbal anaphoric expression *a o face/'to do it'* and the pronominalization pattern present in predicate doubling, which characterizes extrasentential rather than intrasententional anaphoric relationships, clearly point to the absence of syntactic movement, at least in this language. Then, I argued that the Romanian data finds a comprehensive explanation in the approach advocated for in Muñoz Pérez &Verdecchia (2022) for Spanish, according to which the topicalized non-finite form (a contrastive topic) calls attention to an implicit or explicit QUD in discourse and gives rise, in its turn, to another set of other questions that are alternative to the initially posed QUD. The answer to the QUD highlighted by the topicalized predicate is to be found in the fully inflected clause that follows. This approach comes with a nice account for the apparent island effects, explains away the genus-species effects and more adequately fits in with a base-generation analysis for predicate doubling structures. It has the additional advantage that it integrates predicate doubling in the larger context of discourse.

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A COMMON VIEW ON BROAD AND CONTRASTIVE FOCUS EVENTS

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Abstract: This paper proposes a cognitive view on sentence stress patterns to discuss focus elements in both broad and narrow focus contexts. The cognitive perspective is based on the hypothesis that prosodic phrases correspond at the cortical level to cognitive binary relations between speech objects of utterances. On this view, cognitive relations are produced by a generic information packaging (IPk) mechanism that pairs constituents with different cognitive functions. At the utterance level, cognitive relations are implemented by prosodic phrases (relations) where different pitch features mark their two functional constituents. Our proposal is to assign sentence stress patterns with corresponding cognitive structural patterns of utterances. One of the two constituents of cognitive and prosodic relations is nuclear and projects its cognitive function to the whole cognitive unit which it belongs to. The paper proposes a nuclear accent analysis by connecting the cognitive functions of constituents with their phonetic/phonological features. The contours analyzed in the paper as hierarchies of cognitive/prosodic relations are selected from those used by Ladd (2008) to exemplify sentence stress patterns in broad focus statements with ascending and descending contours, and in contrastive focus statements. We conclude that, in the new perspective, different cognitive structural patterns can be assigned to contrastive/broad focus statements in different semantic contexts.

Keywords: cognitive relation, prosodic phrase structure, nuclear element, prominence, focus

1. Introduction

The nuclear accent position is an important feature that characterizes the prominence pattern of prosodic phrases. Ladd (2008: 215-216) presents two competing approaches of prominence patterns of contours. The first one is the Normal Stress (NS) view Chomsky (1968), Cinque (1993) and Zubizarretta (1998) and the second one is the Highlighting (H) view, presented in the Bolinger's works; e.g. Bolinger (1965). Referring to the NS view, Ladd concludes that "there is one pattern of prominence that can be specified by rule for every sentence. This pattern assigns a single most prominent stress – primary stress – to one word of the sentence. Normal stress has no meaning or function: it is simply the result of phonological rules on surface syntactic structures". The phonological rules aim to identify the nuclear accent position in order to associate it with the primary stress of utterance. The NS view is applied only to utterances without contrastive focus on their constituents. The following rule is formulated in Bocci et al. (2020) based on Katz & Selkirk (2011): "If the sentence does not contain any occurrence of the [focus] feature, the nuclear pitch accent is assigned to the rightmost element" which has a certain acoustic prominence.

Ladd (2008) analyzes different intonational contour types by using the NS view in order to identify the sentence stress of the related utterance. In the case of the rise-fall-rise contour of *yes-no* question (1b) he concludes that the primary accent is on the word *driving* and the word *instructor* bears the L phrase accent Ladd (2008: 46, 143). This leads to the sentence-initial position of the normal stress corresponding to rising-falling

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pitch movements. The word *driving* is the first and the last word which bears a pitch accent within the contour, the Normal Stress Rule is satisfied and the nuclear accent is accepted on this word.

(1) a. I hear Sue's taking a course to become a driving instructor.
b. **A driving** instructor!?

The rise-fall-rise contour is also analyzed in Ladd (2008: 144) within the broad focus statement (2b) with four constituents. An L* pitch accent is applied to the word *dancing* and the H phrase accent is applied to the last word *tonight*. In the NS view the first constituent *I thought* bears the sentence stress because its pitch accent is more prominent then the L* pitch accent on *dancing* having a wide pitch range and the former one could be interpreted the constituent with the primary accent of utterance. The verbal phrase of the subordinate clause *she was dancing* is treated as a post-focal constituent with small variation in pitch range.

(2) a. I hear Sue's taking a course to become a driving instructor.
b. **I thought** she was dancing tonight.

The present paper proposes a cognitive view that takes into account all accented words as possible candidates for the nuclear position including the word *instructor* in the first case, and *dancing* and *tonight*, in the second. At the cognitive level, all words of utterances are speech items that compete for the nuclear position. We claim that the results of the cortical competition is reflected by utterances at the prosodic level and the nuclear positions can to be deduced by interpreting the prosodic features of constituents.

In the Highlighting (H) view, a nuclear accent and a sentence stress deduced by a phonological rule is not accepted. Those that support the H view claim that the nuclear position can be assigned on any word which the speaker intends to highlight. In Ladd (2008: 216) this claim is illustrated using Bolinger's work:

> focused words are marked by pitch accent, all pitch accents are individually meaningful, and no one of the pitch accents in an utterance is primary. … In all utterances speakers highlight words according to what they want to say in a specific context.

Ladd illustrates the limitations of this view by using the broad focus statement (3b). The phonological rule identifies sentence stress on the last constituent *francs* bearing an accent with a wide pitch range. Ladd argues that in the case of the word *five* bearing the "information of interest" he has no other rule for identifying the normal stress on the word *five* because the pitch accent with the wide pitch range is also on the last word *francs*. Therefore, he considers the H view cannot deduce in this case the sentence stress on *five* when the pitch accent with significant pitch range is on *francs*.

(3) a. What did they give you for participating in the experiment?
b. Five **francs**.

Ladd considers that the Focus-to-Accent (FTA) theory "narrows the gap between NS theory and H theory" because the new theory distinguishes between semantic focus and pitch accent and treats the parts of utterances with contrastive focus (CF) involving narrow focus (semantic focus) and the parts of utterance without CF as phrases with normal stress that projects its "focus" function to the whole phrase (broad focus). In Ladd's opinion the "focus" constituent that projects its semantic function to the whole phrase is determined by "language-specific rules or structural principles". In the FTA view the sentence (3b) is analyzed as a narrow focus statement in the particular context of the new information on *five*, even the answer ***Five*** *francs* has no contrastive focus meaning. In a narrow focus statement, the sentence stress is on the focus word *five* without engaging the NS rule.

The present paper proposes a cognitive basis for the normal accent rules that can be applied in both broad and narrow focus contexts in order to identify the nuclear constituents of utterances as it results after the speech object representation. The main hypothesis about intonational contours is that they convey the cognitive structure of cortical representations of the respective utterances. Thus, the pitch movements during prosodic words are the result of the F0 frequency modulation by the neuronal output variations of the respective speech constituents during the speech generation process. The cognitive structure of speech object representations is conveyed by the prosodic structure that organizes the corresponding words at the utterance level. In this view, the normal stress position within contours is the consequence of speech object packaging (information packaging) and can be identified by applying a cognitive perspective on F0 contours of utterances.

The cognitive model presented in section 2 involves a cortical mechanism of Information Packaging (IPk) which is responsible for binding speech objects into hierarchically organized cognitive relations marked at the utterance level by prosodic phrases (relations). The cognitive model consists of the functional category definitions including the category of nucleus, and rules for nucleus identification at prosodic phrase level. The cognitive model was also used to explain to explain phrasing and nucleus position in the main Romanian contour types Jitcă (2019) or in contours of English sentences with different information structures Jitcă (2020, 2022).

In section 3 several contours with different focus positions in broad and narrow focus contexts are discussed, in order to identify their cognitive structure differences. Important conclusions summarize the results of this research which lead to a better understanding of information structure of utterances in a direct relationship with their intonational contours.

2. The Information Packaging model

Section 2 summarizes the main aspects of the cognitive model and defines the functional categories of the two structural levels of cognitive relations and their related prosodic phrases (relations). Cognitive relations are binary information units with two contrasted constituents and we named them Cognitive Units (CU). At the cognitive level, utterances are structured by CU hierarchies reflected by prosodic phrase hierarchies, at F0

contour level. The contrast between CU constituents is a functional one and is conveyed by their contrasted tonal features. In the cognitive view, prosodic words are marks applied to words at the utterance level in order to encode the structural information of the corresponding speech objects from the cognitive level. The aim of utterance partitioning consists in identifying the CU hierarchy of utterances.

2.1 Structural levels of cognitive relations

The cognitive model defines the two structural levels of cognitive relations within perceptual object representations by using a set of four functional categories. As the block diagram in Figure 1 presents, the predicate and argument categories defines the first structural level and "theme" and "rheme" categories, the second level.

Regarding predicate-argument structure, Quilty-Dunn (2020) states that "Perceptual Object Representation (PORs) comprise of separate constituents for individuals and properties". He exemplifies this claim by using the sentence *This is a fish* where the constituent *This* corresponds to the individual, *fish* corresponds to the property 'fish', and the syntactic relation between them functions to express the instantiation of fish by the individual. This sort of structure is a canonical example of predicate-argument structure (where *fish* functions as predicate and *This* as argument).

Hurford (2003) considers the predicate-argument structure as "the core of phylo-genetically and ontogenetically primitive (pre-linguistic) mental representations" and claims that "structures of modern natural languages can be mapped onto these primitive representations".

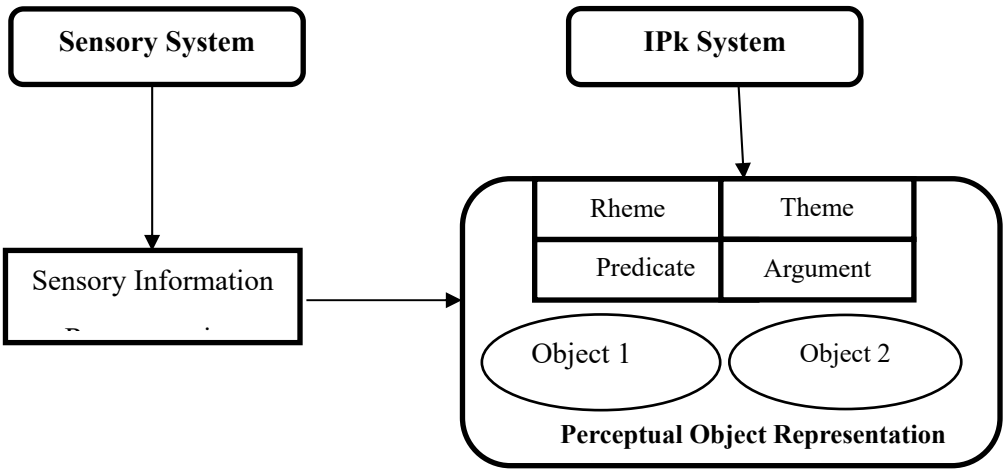

Figure 1. Perceptual Object Representation

At the perceptual object representation level, speech objects become events with a temporal unfolding that are packed into cognitive relation hierarchies. Discussing the common structures of event representations at both perception and memory levels, Zacks (2020) presents the part-subpart structure of two related events as the first structural level

of perceptual representations of events. The part-subpart structure has exactly the same meaning as the argument-predicate structure which describes in Quilty-Dunn (2020) relations within perceptual object representations.

The cognitive model defines CU_argument and CU_predicate functional categories for describing the structure argument-predicate o cognitive relations. CU prefix indicates that the functions have cognitive meaning. At the utterance level, the CU_predicate constituent is marked by the lower target tone, while the CU_argument element is marked by the higher target tone of prosodic phrases (relations).

Gabelentz' model summarized in von Heusinger (2002) presents the argument-predicate structural level in terms of a psychological subject (PS) related to "that about which the hearer should think", and a psychological predicate (PP) related to "what he should think about it". This means that CU_argument is equivalent to the PS category and CU_predicate, to the PP.

In line with Zacks's view presented in Zacks (2020), the part-subpart structure is determined by the spatial delimitation of events in the representational space of their phonetic features and he proposes a second structural level determined by the existence of the temporal delimitation between events on the microbiological time axis. One constituent of cognitive relations is the "cause" event and the other event of the respective relation, is the "effect" event. In this cause-effect view on the order of events, the former event precedes the latter event on the time axis at the neural level. With respect to language, we can speak about the "theme" and " rheme" events, even the semantic theme event does not always precede the semantic rheme event on the time axis of the speech output.

In other words, we can say that the cognitive events related to the speech objects of one utterance are represented in the space of their spatial and temporal features during the construction of their cognitive relation hierarchy or we can say that the temporal evolution of the IPk process of one utterance is encoded in the resulting cognitive representation.

The cognitive model introduces the CU_theme and CU_rheme categories to describe prosodic phrases (relations) at the second structural level. They are marked by different temporal features/shapes of pitch movement during the corresponding prosodic words; e.g. CU_theme is usually marked by slow pitch variation and the CU_rational element is marked by abrupt pitch movements.

The overlapping of the two structural levels is possible at the intonational contour level because the two contrasts are encoded by different acoustic cues of F0 contour involving the two dimensions of pitch variation: tonal target levels and shape or slope of pitch excursion (temporal features). The two structural levels, CU_predicate-CU_argument and CU_theme-CU_rheme, proposed by the cognitive model is a basis for the utterance partitioning description allowing to discuss functional elements in direct relationship to their prosodic features without invoking linguistic aspects.

2.2 Nucleus identification rules

Another aspect of the model refers to the nuclear element of cognitive relations that project its cognitive functions to the whole unit to which it belongs. Based on this

property of nuclear elements, lower-level CUs become functional elements with cognitive functions at the next higher-level relations. In this paper, we suggest the existence of one competition between constituents before their merging into a new unit and, after the nuclear element wins the competition, an exclusion of the non-nuclear elements from the high-gamma activity results but the nuclear one remains in the competition for higher-level nuclear position.

Two nucleus identification rules are formulated and they correspond to the two types of nuclei: emphasized (prominent) and non-emphasized (non-prominent). Emphasis or prominence of phrases is present on CU_argument constituents when they are marked by high pitch accent with the target tone followed by a falling pitch variation during the last part of the accented syllable and/or on the next non-accented syllable(s). We formulate in (4) and (5) two Nucleus Identification Rules related to the two cognitive relation types: NIR_E, for relations with prominent CU_argument constituent and NIR_NE, for relations without prominent CU_argument constituent, respectively.

(4) NIR_E: If the CU_argument of cognitive relations is an elementary constituent marked for prominence, then it bears the nuclear function in the current phrase. If an utterance has two constituents marked by prominence, then it is structured by two nested relations where the prominent constituents are the local and global nuclear elements.

(5) NIR_NE: In cognitive relations without prominence on none of constituents, the CU_predicate bears the nuclear function.

In the present paper, NIR_E and NIR_NE rules are used to deduce local and global nuclei of prosodic phrases (relations) produced by the intonational contours analyzed in section 3.

2.3 The description system of IPk partitions

In view of the IPk model presented in this paper any simple or complex utterance may include a hierarchy of CUs each of them with its own partition. P and A labels were introduced to annotate CU_Predicate and CU_Argument constituents, and T and R labels to annotate CU_Theme and CU_Rheme within IPk partition descriptions. In the proposed description system, two labels are used for annotating one element of partition because it has functions at the two structural levels. Labels are linked by "+" and enclosed in round parentheses.

The description of IPk partitions is a sequence of two pairs of round parentheses separated by slash corresponding to the two CU constituents. In (6) all four possible IPk partition variants for one CU are presented:

(6) a. (A+T)/(P+R)
b. (A+R)/(P+T)
c. (P+T)/(A+R)
d. (P+R)/(A+T)

The description of one CU with lower level CU(s) as constituents encloses the description of lower level IPk partitions between brackets and places a functional label in the indices position after the right bracket.

The description of nested CUs needs to identify nuclear contituents at each level of utterance treee in order to deduce the cognitive functions of local CUs at the next higher level. In the cognitive descriptions of the contours analysed in the paper, the nuclear constituent is annotated by n and N labels in the local and global phrases, respectively.

3. Cognitive interpretation of focus in broad and narrow focus contexts

The section presents seven contours extracted extracted from the utterances of the seven sentences also presented in Ladd (2008) in the context of the discussions about their sentence stress patterns. We selected two sentences with rise-fall-rise contours, and five sentences including the syntactic group *five francs* in different semantic contexts. The cognitive descriptions of the contours consist of prosodic phrase (relations) hierarchies and the related nuclear accent hierarchies.

3.1 Nucleus identification in sentences with rise-fall-rise contours

The first sentence with rise-fall-rise contour is the echo *yes-no* question (1b) and it was selected for cognitive analysis in order to demonstrate that NIRs can be applied to both assertive and interrogative sentences. The contour of sentence (1b) is illustrated in Figure 2. The sequence of pitch accents H* L* applies to the contour the CU_argument-CU_predicate structure at the cognitive level. The cognitive structure is described in (7). At the second structural level, the first word is the CU_rheme (abrupt pitch movements) and the second word is the CU_theme (slow pitch movements). They are annotated by A+R and P+T, respectively, in (7).

The nuclear accent of the utterance is identified on the last word by applying the NIR_NE rule, the intonational phrase having a non-emphasized contour. The first constituent does not generate emphasis because its peak does not reach the top level during the accented syllable *dri*. The top level is reached during the last non-accented syllable *ving*. In the cognitive view, the last constituent has the nuclear position having the CU_predicate function. It is labelled by N in (7).

When the number of constituents increases, rise-fall-rise contours are structured by nested prosodic relations as in the case of the contour illustrated in Fig. 3 corresponding to the sentence (2b). At the lowest level, the utterance has two partitions. The first one is that of the main clause *I thought* and the subject *she (was)* of the subordinated clause. They are related as the CU_argument and the CU_predicate constituents. The CU_argument is non-prominent because the high target tone is followed by a tonal fall down to an intermediate high level of the CU_predicate. This marks the latter constituent as the local nuclear element (NIR_NE) that projects its CU_rheme function to the whole left lower-level CU. The cognitive structure of the contour is described in (8).

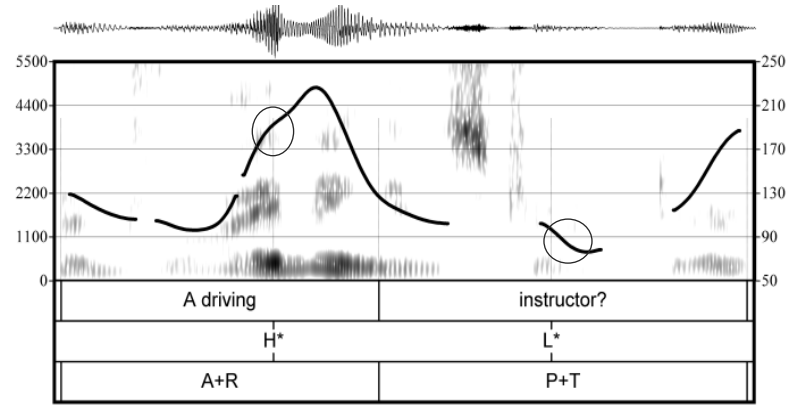

Figure 2. The contour of one utterance of the English echo question *A driving instructor*?

(7) A driving^{A+R}/ instructor$^{P+T}{}_{N}$?

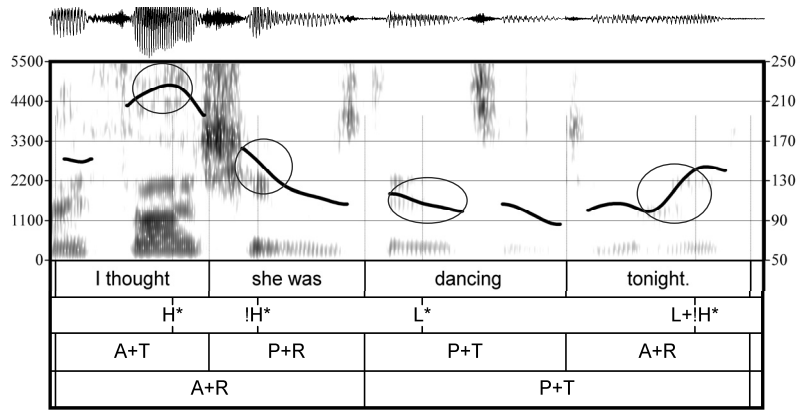

Figure 3. The contour of one utterance of the broad focus statement *I thought she was* ***dancing***$_{F}$ *tonight*

(8) [[I thought^{A+T} / she was $^{P+R}$]$_{A+R}$ /[dancing$^{P+T}{}_{\mathbf{N}}$/tonight^{A+R}]$_{P+T}$

The righ lower-level CU is that of the verb *dancing* and the adverb *tonight* as the CU_predicate and CU_argument element, respectively. The CU_argument *tonight* has no prominence because the contour does not fall after the target tone is reached. Thus, the verb *dancing* bears the nuclear element at this level (NIR_NE).

At the global level, the group *I thought she was* is the CU_argument and CU_rheme constituent which is in contrast with the last group *dancing tonight* with the CU_predicate and CU_theme functions. None of constituents has prominence and the global nuclear element is the global CU_predicate *dancing* (NIR_NE).

At the semantic level, the focus event can be related to the group *she was dancing* because a set of alternatives may be assigned to it. In the cognitive view, we can understand why the first constituent *(I) thought* does not bear the primary accent contrary

to Ladd's interpretation based on the phonological reasons. In all types of sentences the primary accent is carried by the global nuclear element and it results after the utterance partitioning and the nucleus identification on a cognitive basis.

3.2 Utterances with descending phrase-final contours

Ladd (2008) has a special interest in describing different sentence stress patterns of the same syntactic group *five francs* in different semantic contexts. We propose a cognitive description of patterns in the analysed contexts. One of them is that produced by the broad focus statement (3b). Its descending contour is represented in Fig. 4 where the word *five* has a high level pitch movement and the word *francs* has a wide range falling movement. This leads to the CU_argument function of the former element and the CU_predicate function of the latter one. The sentence structure is described in (9). The constant high level marks the word *five* as the CU_rheme element while the slow falling pitch movement during the word *francs* marks it as CU_theme element. The phonological normal stress rule identifies the sentence stress on the last constituent *francs* because the falling pitch movement makes it acoustically prominent and it is in the righmost sentence-position.

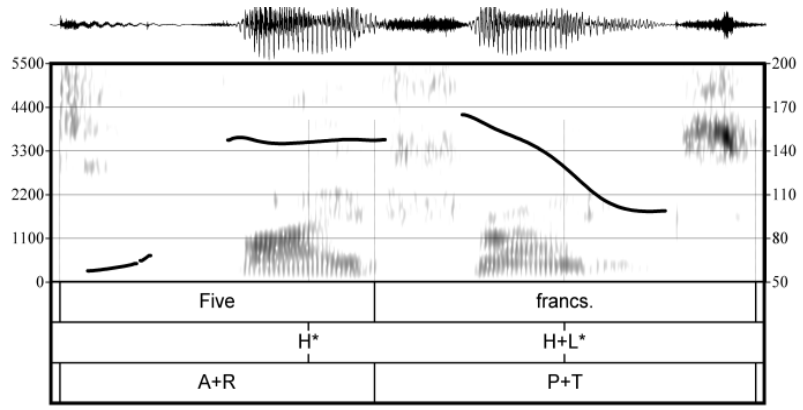

Figure 4. The contour of one utterance of the broad focus statement *Five francs*$_{F}$

(9) Five^{A+R} / **francs** $_{N}$ $^{P+T}$

The same decision results after applying NIR_NE rule to the analysised contour. The descending contour has no emphasis because the word *five* is non-prominent. The CU_argument *five* reaches a high target tone but the tone is not followed by a falling pitch variation. The CU_predicate constituent *francs* begins with a tonal step up to a little higher level and then the falling pitch variation follows. Based on NIR_NE rule, the last constituent bears the nuclear function having the CU_predicate function.

(Ladd 2008) considers the phonological Normal Stress rule has problems when it has to decide the nuclear position of the numeral *five* in the case it carries new information. In this particular case, the sentence stress must be on *five* despite the fact that

the phonological rule associates the normal stress with the wide pitch range and the righmost position of the word *francs*. There is no phonological rule to associate a word in a non-final-sentence position to the nuclear function within broad focus statements. In the light the FTA theory the prominence that applies the nuclear function to the word *five* can occur only in the contrastive focus context exemplified in Ladd (2008) by the sentence in (10).

The contour of one utterance of the second clause of the sentence (10) is presented in Figure 5 and we use it to describe the sentence stress pattern of the group *five francs* with the primary accent on the word *five.* We consider that the sentence (10) is uttered with a neutral intonation despite the contrastive context suggested by the text. Thus, the sentence in (10) does not generate a narrow focus statement with non-neutral intonation. The cognitive analysis has to be applied in both broad and narrow focus statement interpretations.

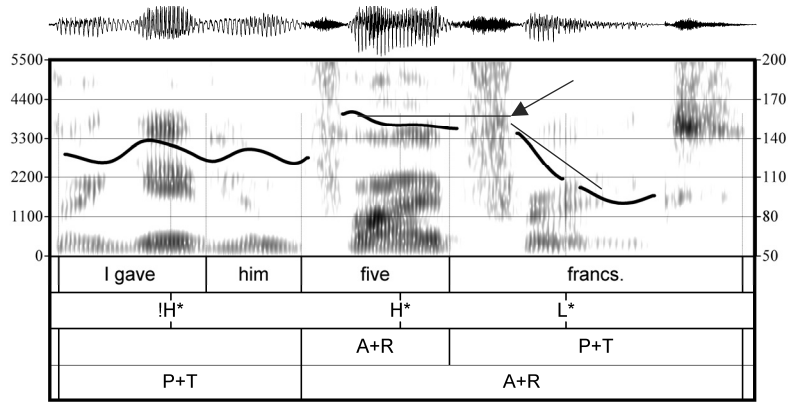

Figure 5. The contour of the clause *I gave him **five** francs* in the context of the narrow focus statement *I didn't give him three francs, I gave him **five**$_F$ francs.*

(10) I didn't give him three francs,
[(I gave him)$_{P+T}$ /(**five** $_N$ $^{A+R}$ / francs^{P+T})$_{A+R}$]$_{A+R}$

At the global level, the verbal group *I gave him* is the CU_predicate and CU_theme element and the noun phrase *five francs* is the CU_argument and CU_rheme element. At the local level, the word *five* is prominent having the highest tonal target followed by a falling pitch variation during the word *francs.* This leads to the nuclear function of the former constituent with CU_argument function (NIR_E rule).

The group *five francs* represented by the nuclear element *five* is the prominent CU_argument of the intonational phrase that bears the global nuclear function (NIR_E rule). *Five* is annotated by *N* in (10). We claim that the normal stress of the answer *five francs* of the question (3a) is generated in the same manner as the group *five francs* in the case of sentence (10) when it is uttered with neutral intonation. We consider that broad focus statements include all statements that do not introduce a new information element marked by narrow focus. Thus, normal stress can be identified in both cases of statement (3b), with the normal stress on *francs* and on *five*, by using NIR_NE and NIR_E rules, respectively.

In (Ladd 2008), the case of contrastive focus on *francs* is also analysed, in the context of the sentence (11). The second intonational phrase produced by one utterance of the sentence is represented in Figure 6 where it can be observed that the word *five* with the CU_predicate and CU_thematic element (P+T label) is related to the verbal group *I gave him* with the CU_argument and CU_rheme functions (A+R label). The CU_argument constituent is non-prominent because it is followed by a tonal step up to the level where the word *five* begins its falling pitch movement. Thus, the numeral bears the local nuclear function having CU_predicate function (NIR_NE rule).

At the second clause level, the group *I gave him five* is in contrast with the focus word *francs* which is the global CU_argument and CU_rhematic element (A+R label). The latter constituent is prominent, its highest target tone being followed by a falling pitch variation. The word *francs* is marked by emphasis which gives it the global nuclear function at the second clause level. Sentence (11) is uttered as a contrastive focus statement with non-neutral intonation.

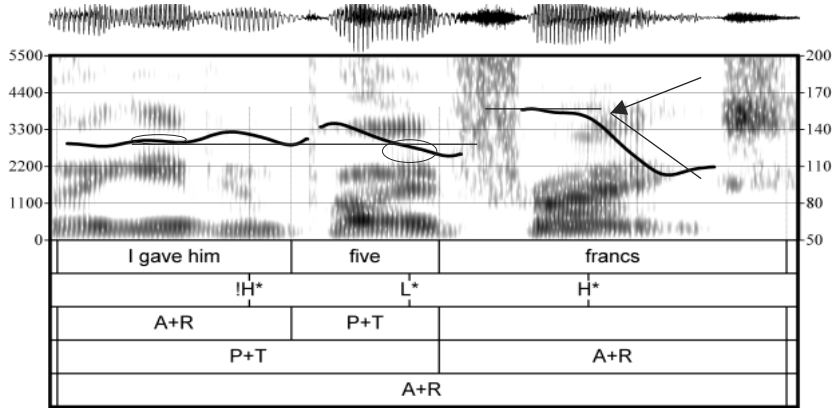

Figure 6. The contour of the clause *I gave him five* ***francs***$_{F}$ in the context of the contrastive focus statement *I didn't give him five pounds, I gave him five* ***francs***$_{F}$

(11) I didn't give him five pounds,
[[(I gave him)$^{A+R}$ /five^{P+T}]$_{P+T}$ /francs $_{N}$ $^{A+R}$]$_{A+R}$

We conclude that the sentence stress pattern in this contrastive focus context may be characterized as follows. The numeral *five* is grouped to the left with the verbal phrase and it bears the local nuclear element in the resulted group. The noun *francs* is the global CU_argument and nuclear element marked by emphasis (prominence).

Ladd (2008: 214) introduces another sentence stress pattern for the group *five francs* within the double narrow focus statement produced "in relatively unusual circumstances ". It is exemplified by the utterance of the sentence in (12). The second intonational phrase of this utterance is presented in Figure 7 where it can be seen that both focus words *five* and *francs* have CU_argument functions and begin their falling pitch movements at very high tones. The word *five* is the CU_argument element within the embedded phrase where the verbal group *I gave him* is the CU_predicate. Its high

target tone near the top level and the following falling pitch movement produce emphasis at this local level and mark it as the local nuclear function (NIR_E rule). It is labelled by *n* in (12).

At the global level, the word *five* is the CU_predicate because its contour suddenly falls under the top level of the word *francs*. Thus, the latter constituent is a CU_argument marked by prominence because the top-level target tone is followed by falling pitch movement. This explains its global nuclear function (NIR_E rule), and it is labelled by *N* in (12).

The prominence pattern of the clause *I gave him five francs* in the double focus context differs from that of the sentence (11) by the local high prominence of the word *five*. The two prominence patterns have in common the global prominence of the word *francs* that marks it with global focus function.

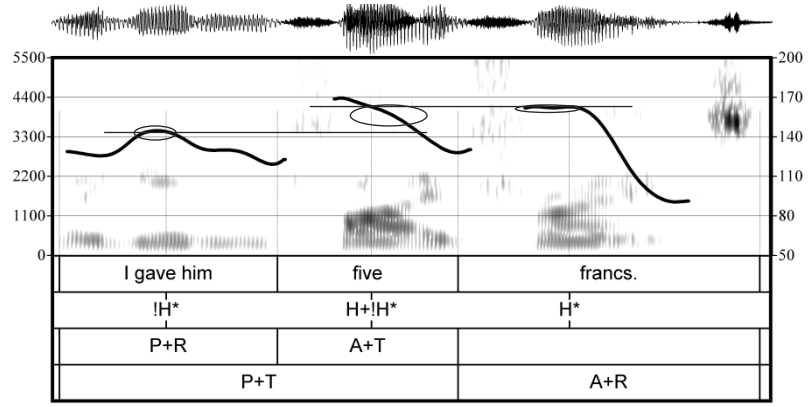

Figure 7. The contour of the clause *I gave him **five francs*** in the context of the narrow focus statement *I didn't give him seven euros, I gave him **five**$_f$ **francs**$_F$*

(12) I didn't give him seven euros,
[[I gave him $^{P+R}$/ five $_n$ $^{A+T}$]$_{P+T}$ / francs $_N$ $^{A+R}$]$_{A+R}$

The prominence pattern of the sentence (12) in the double focus context differs from that of sentence (11) by the CU_argument and nuclear functions of both words *five* and *francs* that are in agreement with their contrastive focus functions, at the semantic level.

The last prominence pattern of the clause *I gave him five francs* is related to the context of sentence (13) where "the phrase *five franc*s is contrasted as a unit" to the word *a dollar* from the first clause Ladd (2008: 214). The group *five francs* taken as a unit, bears new information in the second clause leading to its focus function. Figure 8 represents the contour proposed by us to represent the sentence (13) because in database of Ladd's book the related utterance does not structuraly differ from that represented in Figure 6.

In Figure 8 we can see that the word *five* is grouped to the right with the word *francs* within the low-level CU. In their unit, the former constituent is the CU_argument having the higher target tone and the latter one, is the CU_predicate having the lower

target tone. In this low-level unit, the word *francs* is the nuclear element (NIR_NE). The high target tone of *five* does not generate prominence because it is followed by a tonal step up the a little higher tone and then it falls until the low boundary tone.

At the global level, the group *five francs* is the CU_predicate and CU_theme constituent, and the verbal phrase *I gave him* is the global CU_argument and CU_rheme element. The verbal phrase has no prominence and group *five francs* bears the global nuclear function (NIR_NE).

The sentence in (13) is a contrastive focus statement with new information but it is uttered as a broad focus statement. The last accent of the intonational phrase has a low type and marks *francs* as the global focus word in the same manner as in the case of sentence (9). Thus, the last utterance differs to the utterances represented in Figures 6 and 7 where the word *five* is grouped to the left with the verbal phrase in a lower-level group. In the utterance illustrated in Figure 8 the word *five* is related to the right with the word *francs* under the global focus unit.

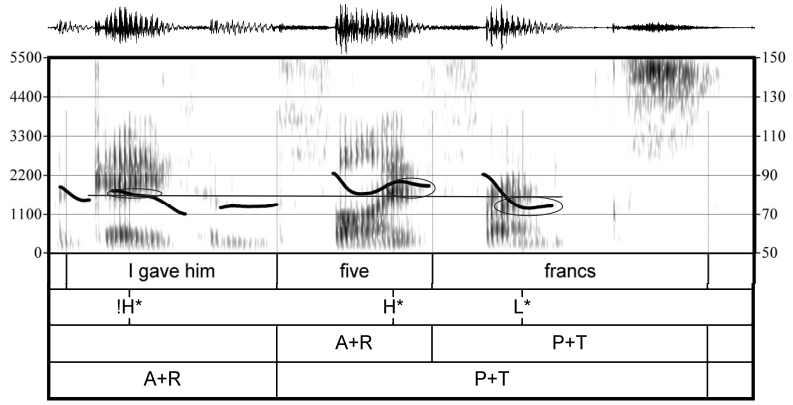

Figure 8. The contour of the clause *I gave him (five francs)*$_F$ proposed in the context of the contrastive focus statement *I didn't give him a dollar, I gave him (five francs)*$_{\boldsymbol{F}}$.

(13) I didn't give him a dollar,
[(I gave him)$_{A+R}$ /(**five** $^{A+R}$ / francs$^{P+T}{}_{N}$)$_{P+T}$]$_{P+T}$

In the first part of section 3 one *yes-no* question and two broad focus statements are presented, the first broad focus statements having ascending phrase-final contour and the second one, descending phrase-final contour. In the former case, we explain why the high target tone of the sentence-initial constituent does not produce emphasis and why the global nucleus is deduced by the NIR_NE rule on the global CU_predicate constituent of the utterance. In the latter case, the group *five francs* in the broad focus statement is presented. In the second part of section 3 the four prominence patterns of the clause *I gave him five francs* in the four narrow focus contexts are characterized by using the perspective and the categories of the cognitive model presented in section 2. The intonational phrase of the utterances related to the four contexts has different structural and nuclear patterns, presented in Figures 5-8 and described in (10)-(13). We consider that the words *five* and *francs* act as a unit only in the contour illustrated in Figure 8

corresponding to neutral intonation. Only in this case the two words are merged into a low level relation at the cortical level and their related prosodic words are the two parts of the same peak, at the prosodic level.

4. Conclusions

The paper proposes the cognitive model of information structure as a common basis in analysing prominence patterns of statements in broad focus and narrow focus contexts. The model formulates rules for the nuclear element identification and gives answers to the Ladd's question: "On what basis is a single word selected to bear the main accent". The rules formulated within the model for the nuclear accent identification legitimates nuclear elements to project their cognitive functions to the whole phrase/unit which they belong to.

The prominence of nuclear accents is a result of the competition between neurons which evocate speech items of utterances at the cortical level during their integration as perceptual objects. This neuronal mechanism gives a cognitive meaning to the nuclear element of phrases. Focus events are linguistic (semantic) events implemented by constituents with nuclear functions at the pragmatic level.

The paper proposes the cognitive perspective for the utterance partitioning description. The semantic information structure analysis has to use the cognitive description of utterances and then it may assign semantic functions to constituents. Halliday (1967) proposes the background-focus structure for describing the structure of prosodic phrases (intonation units) and Steedman (2000) also adopted it, but semantic focus constituents correspond to cognitive nuclear elements; this explains why focus category cannot be used in descripting the structure of phrases. Focus (nucleus) labels only signals the sentence/phrase accent and other cognitive categories are involved in phrase structure desriptions (CU_argument, CU_predicate, CU_theme and CU_rheme) because prosodic phrases (relations) have cognitive meaning. After the cognitive description, semantic category labels may be assigned to certain constituents with semantic functions at the information structure level.

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ACQUISITION OF THE AFFRICATE /tˢ/ IN GREEK: A CASE STUDY

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Abstract: The present research examines the acquisition of affricates by one Greek-speaking child so as to investigate their phonological status in the underlying representation. For this reason, a comparison is made between the affricate [tˢ] and the clusters [ks], [ps] to see if their phonological status is same or different. The child's data reveal a preference of the [-continuant] over the [+continuant] feature in reductions in all the aforementioned categories. However, the child manages quite often to utter [tˢ] faithfully, while clusters do not present any faithful production. So, the acquisition of [tˢ] precedes that of clusters. These findings support Lombardi's (1990) Unordered Component Hypothesis, according to which the features [−continuant] and [+continuant] of affricates are unordered and are represented on two different tiers. In other words, their features are considered single-valued, namely, they are either present or absent. For the analysis of child's tokens, Maximum Entropy Grammar is used (Goldwater & Johnson 2003), which can adequately account for the various handling of affricates.

Keywords: affricates, language acquisition, phonological representation, Maximum Entropy Grammar

1. Introduction

The majority of researchers agree that phonetically affricates are represented as *complex* segments composed of ordered [−continuant] and [+continuant] specifications (e.g. Sagey 1986, Lombardi 1990, Rubach 1994). However, they have been a long-standing topic of discussion due to their phonological status, which constitutes a matter of dispute. Four main analyses have been proposed leading to four different underlying representations of affricates. As far as the first proposal is concerned, they are considered bipositional clusters consisting of a stop [t] and a fricative [s] (see for Greek: Newton 1961, Setatos 1974, among others). This claim is based on the fact that only vowels can follow after [ts] and [dz] (e.g. Newton 1961). Another argument concerns the occurrence of [ts] as well as both members of it separately in the same phonetic environment, namely, they create minimal pairs (example 1).

(1) [paˈtsas] (tripe) - [paˈtas] ((you) press) - [paˈsas] (pasha)
(Greek, Setatos 1969: 50)

In the second view, they are thought of as monopositional *contour* segments in which the features [−continuant] and [+continuant] are ordered, that is, the stop precedes the fricative and they are subordinated to a single root node (Sagey 1986). The reason why Sagey (1986) suggests affricates as contour segments is due to the emergence of edge effects at their margins, namely, they act in phonological processes as stops regarding their left edge and as fricatives regarding their right edge. For instance, in order for two adjacent sibilants to be licensed, epenthesis of vowel [i] must take place between them (examples 2a-b).

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(2) a. /bʌs+z/ [bʌsiz] *buses*
b. /tʃɜ:(r)tʃ + z/ [tʃɜ:(r)tʃiz] *churches*

(English, Sagey 1986: 93 - 94)

Epenthesis is used so that Obligatory Contour Principle (Goldsmith 1976: 163), which prohibits adjacent segments that have the same specification for one distinctive feature, should not be violated. An instance that shows affricates act as stops on their left edge constitutes a rule in Zoque (Wonderly 1951), which enforces the voicing of a [−continuant] consonant after a nasal (examples 3a-b).

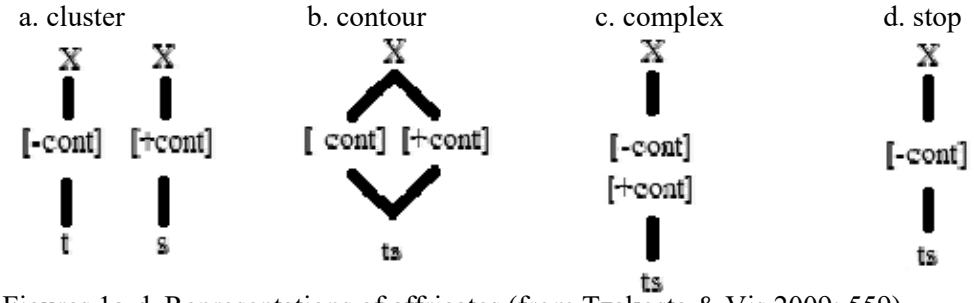
(3) a. /nʌm + pa/ [nʌmba] 'he says'
b. /pʌn + tɕʌki/ [pʌndʑʌki] 'figure of a man'

(Zoque, Wonderly 1951: 120)

In Greek, some researchers consider affricates as contour segments since [tˢ] can appear simultaneously in the first and second syllable of a word especially when the vowels bear the same distinctive features as in [tˢaˈtˢaɾa] (comb), something that does not happen with clusters (Householder 1964).

According to a third suggestion, affricates are characterized as complex segments with their features to be unordered and single-valued which means that they are either present or absent (Lombardi 1990). Given that in English two adjacent tautosyllabic strident segments are prohibited due to the Obligatory Contour Principle, if the features of affricates are ordered, then clusters containing [s + affricate] will be permitted since the left member of affricate is specified as [−continuant]. However, the same researcher claims that such clusters are also disallowed by the Obligatory Contour Principle leading to the absence of forms with [tˢs] and [stˢ], which would otherwise be expected.

According to the last proposal, affricates are viewed as simple stops; stridency is not represented in the underlying representation and it is added in order for affricates to be perceptually more salient (e.g. Jakobson, Fant & Halle 1951, Rubach 1994, Kehrein 2002). This analysis is based on the common properties of stops and affricates on the phonological level and it is argued that the latter are uttered as affricates on the phonetic level, which may be due to the idiolect of a speaker or the dissimilation with another segment that has the same place of articulation in order for a sound to be perceived easier (Kehrein 2002). All the aforementioned analyses of affricates are illustrated below, in Figures 1a-b.



Figures 1a-d. Representations of affricates (from Tzakosta & Vis 2009: 559)

The aim of the present study is to provide acquisitional evidence regarding the underlying representation of affricates. The structure of the paper is the following: section 2 includes literature review concerning previous research dealing with affricates in language acquisition. In section 3 the research methodology is presented. Section 4 contains the description and discussion of the child's tokens of the affricate [tˢ] in comparison to those of the clusters [ks] and [ts], while in section 5 the analysis of the data based on *Maximum Entropy Grammar* (Goldwater & Johnson 2003: 112) is presented. In section 6 the main findings of our study are summarized.

2. Studies on affricates in language acquisition

There are not enough researches in many different languages investigating affricates' underlying representation in child speech. In most of them a comparison between the acquisition of affricates and clusters containing especially [stop + s] and [s + stop] sequences is made. A non-controversial hypothesis essential to these researches is that the development of syllable structure begins from the least complex to the more complex ones (e.g. Lleó & Prinz 1997). So, the core CV syllable is followed by CVC and then the additional branching of onset and rhyme is accomplished leading to CCVC and CCVCC structures if they are permitted by the target language. The same researchers assume that in language acquisition C and V are not symbols for consonants and vowels but abstract units on a skeletal tier as in metrical phonology. Taking these assumptions into consideration, it is assumed that if affricates behave as clusters, then their acquisition should be similar to that of the latter, while if they are contour or complex segments, then they should be acquired before clusters.

The first study concerns five monolingual German and four monolingual Spanish-speaking children aged 1;5 – 2;2 years old (Lleó & Prinz 1997). German includes four affricates in its inventory and, more specifically, [pf], [ts], [tʃ], [dʒ], while Spanish only one, [tʃ]. The comparison between affricates and clusters reveals that the former are acquired earlier than the latter, while there is a stage where both categories present cases of *reduction* to one consonant, the choice of which is proposed to be driven by *directionality* of syllable structure assignment (Lleó & Prinz 1996). In particular, left to right syllabification leads to the production of the first consonant and right to left to the second one, resulting in the German-speaking children uttering the [−continuant] segment and the Spanish-speaking toddlers the [+continuant], since the direction of syllabification is attributed to the target language, with German being rightwards and Spanish leftwards[1]. The principle of directionality presupposes two members in affricates, a [-continuant] and a [+continuant] part where the former precedes the latter. This way evidence is provided in favor of Sagey's (1986) Ordered Component Hypothesis, in which affricates are seen as contour segments with their features ordered.

In the next study, monolingual Greek-speaking children are examined (Kappa 1998). In Greek, [tˢ] and [dᶻ] belong to the category of affricates. The data of children are

[1] Unfortunately, it is not possible to cite any example here, since only tokens with faithfulness are provided in this study, but we hope that the description on its own suffices to make the proposal clear.

discussed in comparison to the previous research. Given that directionality is leftwards in Greek (see Drachman 1990, Kappa 1995, among others), the second member of affricates and clusters is expected to be uttered, namely, the fricative. However, in the first developmental stage children produce the [−continuant] consonant, as shown in the following examples (4a - b).

		Adult's output	→ Child's output	Child: Age
(4)	a.	[ˈet^{s}i]	→ [ˈeti] 'so'	Child 1: 2 - 2;6
	b.	[ˈkat^{s}o]	→ [ˈkato] '[I will] sit down'	Child 3: 2 - 2;6

(Greek, Kappa 1998: 32 327)

Thus, in the first acquisition stage of children, reductions cannot be explained by the directionality of syllabification. On the other hand, the *Sonority Hierarchy Hypothesis* (Kiparsky 1979: 432) is argued to interpret sufficiently these specific reductions, according to which the less sonorous consonant is preferred over the more sonorous one in onset position. In affricates and clusters, for instance, the stop is preferred as it is the least sonorous on the sonority scale (Figure 2).

stops > fricatives > nasals > liquids > glides > vowels

less sonorous more sonorous

Figure 2. Sonority Scale (drawn from Kiparsky 1979: 432)

In the second developmental stage though, where more marked structures arise, there is a preference for the utterance of the [+continuant] segment, as in (5a-b):

		Adult's output	→ Child's output	Child: Age
(5)	a.	[kalˈt^{s}aci]	→ [kaˈsaci] 'sock, diminutive'	Child 2: 2;9 - 3
	b.	[ˈkat^{s}o]	→ [ˈkaso] '[I will] sit down'	Child 3: 2;9 - 3

(Greek, Kappa 1998: 327)

From these facts the research concludes that ordering in the underlying feature component is not presented and the data seem to conform to Lombardi's (1990) Unordered Component Hypothesis.

Another study conducted on seven monolingual Greek-speaking children aged from 1;7.5 to 3;5 years old compares affricates with all types of clusters in the intermediate developmental phase during which they are observed to utter unmarked, relatively unmarked, relatively marked and fully faithful outputs (Tzakosta 2009). Two similarities between these two categories are ascertained. In the first, all of them undergo reduction. The consonant produced is either the least sonorous or the most adjacent to syllabic nucleus satisfying in the last case contiguity, that is, the continuous string of adjacent segments (McCarthy & Prince 1995: 371, Kager 1999: 250). Representative examples are given in (6a-f):

		Adult's output	→ Child's output	Child: Age
(6)	a.	[ˈvle.po]	→ [ˈle.po] '[I] see'	B.M.: 2;2.12
	b.	[a.ˈvli]	→ [a.ˈvi] 'garden'	I: 2;9.7
	c.	[spi.ˈta.ci]	→ [pi.ˈta.ci] 'house, diminutive'	Kon: 1;11
	d.	[ˈpse.ma]	→ [ˈpe.ma] 'lie)'	B.M.: 1;11.1
	e.	[e.le.ˈni.tsa]	→ [ˈni.ta] 'Eleni, diminutive'	B.M.: 1;9.22
	f.	[mu.ˈdzu.ɾa]	→ [mu.ˈdu.ɾa] 'stain'	I: 3;1.3

(Greek, Tzakosta 2009: 368-369)

In the second, they exhibit cases of fusion, a process in which the produced segment inherits place and manner features from both consonants of the cluster (Kager 1999: 59, Kappa 2004: 210), as represented below (examples 7a - d).

		Adult's output	→ Child's output	Child: Age
(7)	a.	[ˈða.xti.lo]	→ [ˈka.ci.lo] 'finger'	B.M.: 2;2.18
	b.	[mi.ˈkro]	→ [mi.ˈto] 'small'	F: 2;5.1
	c.	[tsi.ˈba.i]	→ [θe.ˈfa.i] 'he/she/it bites'	B.M.: 2;2.5
	d.	[pe.ˈtse.ta]	→ [pe.ˈθe.ta] 'towel'	F: 2;9.5

(Greek, Tzakosta 2009: 366, 369)

The conclusion drawn from children's data is that the common way in which these two processes (6 - 7) are applied to all the aforementioned categories provides indications for the assumption that affricates are considered consonantal clusters (Tzakosta 2009), agreeing with some other researchers' views (e.g. Newton 1961, Setatos 1974). The substitution of simple segments by affricates, as in (8a-c), constitutes another indication:

		Adult's output	→ Child's output	Child: Age
(8)	a.	[mo.ˈɾa.ci]	→ [mo.ˈɾa.tsi] 'baby, diminutive'	I: 3;0.24
	b.	[ˈe.pe.sa]	→ [ˈe.pe.tsa] '[I] fell'	F: 2;2.24
	c.	[bu.ˈzu.ci]	→ [bu.ˈdzu.ci] 'bouzouki'	Kon: 2;0.30

(Greek, Tzakosta 2009: 372)

Another study deals with affricates in a child aged 1;6.15 – 2;9.5 years old whose mother tongue is the east Cretan dialect, from which the child receives most linguistic stimuli and less from Modern Greek (Papoutsakis 2018). The Cretan dialect contains two affricates, [$t^{ɛ}$] and [$d^{ʑ}$] which are investigated along with those of Modern Greek. All of them are viewed as less complex than clusters as they maintain their manner at 43%, while [stop + s] and [s + stop] clusters are not faithfully uttered until the end of the study (examples 9a-c)[2].

[2] All adult's outputs are listed here in the Cretan dialect, which is the main language the child hears and receives from its parents.

		Adult's output	→ Child's output	Child: Age
(9)	a.	[e.ˈtᵉi]	→ [e.ˈtᵉi] ('here'	Zax: 2;4.3
	b.	[ˈpsar.ʑa]	→ [ˈta.ʑa] 'fishes'	Zax: 2;4.13
	c.	[ve.ˈdᶻi.na]	→ [ˈdᶻi.na] 'petrol'	Zax: 2;1.19

(Greek, Papoutsakis 2018: 35-36, 48)

Furthermore, affricates present fewer faithful productions in relation to stops, while they preserve their manner more in comparison to stridents. So, affricates seem to constitute a separate natural class, the acquisition of which together with stridents follows the acquisition of stops and precedes that of clusters (Papoutsakis 2018).

3. Research methodology

Before the meetings with the child, the parents provided verbal and written consent. The data comes from a monolingual girl with typical linguistic development, with Modern Greek as her mother tongue. The researcher came in contact with the child in order for a relationship of familiarity to be established till the recordings began. The meetings took place in a nursery. For the collection of data, the professional tape recorder Marantz PMD661MKII was used. In total 6.246 tokens transcribed from spontaneous speech and picture naming via a laptop have been gathered. The pictures were drawn from another study in Greek child speech (see Kappa & Paracheraki 2014) with some modifications for the needs of the present study, which include everyday words, such as animals, foods, vehicles, plants, professions, household utensils, buildings. They were created in a certain way in order for the child to have the opportunity to utter all types of consonants and clusters regarding their place, manner and *voice* in every position within a word (initial, middle, final unstressed or stressed syllable). In addition, spontaneous speech was collected through activities inside kindergarten or in its courtyard, such as reading books, playing with balls, dolls, cars, painting, fun in slide, swings, seesaw. All recordings were accomplished in colorful and full of toys rooms in order for the child to feel comfortable and not to be distracted. This way her productions do not come from hesitation or lack of concentration. Her speech was recorded 1-2 times per week and the research lasted about 1 year and 3 months, while the duration of each meeting was 15-30 minutes. The child's age during the investigation was from 1;6.26 to 2;9.12 years old. Our assumptions are based on 89 tokens containing [tˢ], 65 of [ks] and 14 of [ps]. As far as [dᶻ] is concerned, it is excluded from the present study, since it is traced only in 5 tokens and we cannot deduce any generalizations from these. With exception of one token ([ˈkse.ɾo] → [ˈtˢe], (I) know, 1;7.19), all the others emerge in the intermediate developmental stage, namely, after the age of 2 years old, where more marked structures arise as clusters, polysyllabic words, consonants specified as fricatives and generally at this developmental stage all types of consonants are uttered to a different degree. According to some researchers, the emergence of codas, clusters, fricatives, the production of trisyllabic or longer words with *faithfulness* to the number of syllables and words with marked syllables as V, VC, CVC, CCV constitute indications for the transition from the early stage, in which mostly unmarked structures appear, to the intermediate one (see for Greek: Kappa 2000, Tzakosta 2003, Tzakosta & Kappa 2008).

For the reproduction, processing and conversion of audio material into phonetic tokens the Audacity software was used, while the tokens were recorded and organized via Microsoft Office Word. It should be noted at this point that we did not use any software for the phonetic analysis of child's tokens and the transcription was done by ear only. For this reason, only data in which there is a high degree of certainty of child's utterances have been included. Moreover, the International Phonetic Alphabet is used for the phonetic rendering of words.

4. Comparison between affricates and [stop + s] clusters

The comparison of the affricate [t^{s}] and the clusters [ks], [ps] leads to the results summarized in Tables 1 and 2 below:

Table 1. Processes observed

Process	[t^{s}]	[ks]	[ps]
Deletion	14 / 89 (15.7%)	4 / 64 (6.2%)	1 / 14 (7.1%)
Reduction	51 / 89 (57.3%)	49 / 64 (76.6%)	11 / 14 (78.6%)
Faithful utterance	24 / 89 (27%)	0 / 64 (0%)	0 / 14 (0%)
Substitution with [t^{s}]		9 / 64 (14.1%)	2 / 14 (14.3%)
Substitution with [d^{z}]		2 / 64 (3.1%)	0 / 14 (0%)

Table 2. Segment uttered after reduction

Segment	[t^{s}]	[ks]	[ps]
Stop	37 / 51 (72.5%)	31 / 49 (63.3%)	7 / 11 (63.6%)
Fricative	14 / 51 (27.5%)	18 / 49 (36.7%)	4 / 11 (36.4%)

At first glance, all categories present two major similarities. The first concerns the most systematic process traced, which is reduction to one segment (Table 1, [t^{s}] 57.3%, [ks] 76.6%, [ps] 78.6%). Indicative tokens are cited next (examples 10a-f).

		Adult's output	→ Child's output	Child: Age
(10)	a.	[ˈt^{s}a.da]	→ [ˈta.da] 'bag'	Girl: 2;4.28
	b.	[pe.ˈt^{s}e.ta]	→ [pe.ˈte.ta] 'towel'	Girl: 2;8.21
	c.	[ˈksi.la]	→ [ˈci.la] 'wood, plural'	Girl: 2;2.2
	d.	[ˈda.ksi]	→ [ˈda.ci] 'ok'	Girl: 2;3.22
	e.	[psa.ˈɾa.ci]	→ [pa.ˈla.ci] 'fish, diminutive, m[3]'	Girl: 2;5.8
	f.	[psi.ˈla]	→ [si.ˈa] 'highly'	Girl: 2;9.12

[3] (m) = mimicry. The direct utterance of a token by the child immediately after the utterance of the same token by the adult is characterized as mimicry. The strategy of mimicry from child constitutes a learning process. In other words, the child hears the token, processes it and utters it after having heard it again by itself. We assume that the process of information transfer between adult and child contributes to the in-depth understanding of the information. For this reason, the child's mimicries are included in the present research.

The second has to do with the preferred consonant in case of reduction Table 2. In all the categories the stop is usually uttered, while the percentages of stop's and fricative's production frequencies are close to each other, since the former is selected a lot more frequently than the latter. Consider the examples below:

		Adult's output	→ Child's output	Child: Age
(11)	a.	[ko.ɾi.ˈtˢa.ci]	→ [i.ˈta.ci] 'girl, diminutive'	Girl: 2;5.15
	b.	[ˈe.ka.tˢa]	→ [ˈe.ka.sa] '[I] sat'	Girl: 2;6.20
	c.	[a.ˈma.ksi]	→ [ˈma.ci] 'car'	Girl: 2;5.1
	d.	[a.ˈma.ksi]	→ [ˈma.si] 'car'	Girl: 2;6.20
	e.	[ˈpsa.ɾi]	→ [ˈpa.i] 'fish'	Girl: 2;6.27
	f.	[psi.ˈla]	→ [si.ˈa] 'highly'	Girl: 2;9.12

This way, the child selects to satisfy mainly the Sonority Hierarchy Hypothesis (Kiparsky 1979: 432) and less contiguity (McCarthy & Prince 1995: 371, Kager 1999: 250). The determining factor for the choice of the segment that is uttered more systematically is its degree of acquisition in the intermediate developmental stage. [t] is always produced faithfully. [p] (99.6%) has been acquired, while [k] (84.7%) has almost been acquired[4]. All of them bear higher percentages than [s] (45.7%). These differences in percentages are attributed to their order of acquisition and *markedness*. Stops are observed to be acquired first in Greek child speech (Magoula 2000) and cross-linguistically they are considered the most unmarked in relation to other categories of consonants (see for English: Battistella 1990, for Greek: Tzakosta 1999, 2001, among others). Fricatives, on the other hand, constitute one of the last categories that are acquired in children's linguistic development (see Fikkert 1994 for Dutch, Magoula 2000 for Greek, among others). So far, we could claim that in this child affricates constitute clusters. However, they present one important difference in relation to clusters regarding tokens appearing with faithfulness. The child manages to utter affricates faithfully at 27% (examples 12a-b), while the corresponding percentage of [ks] and [ps] is 0%.

		Adult's output	→ Child's output	Child: Age
(12)	a.	[ˈka.tˢo]	→ [ˈka.tˢo] '[I] sit'	Girl: 2;4.26
	b.	[ˈkal.tˢa]	→ [ˈka.tˢa] 'sock'	Girl: 2;6.27

The faithful utterance of [tˢ] may not be high enough, but its percentage compared to that of clusters has a significant variance. This variance reveals that the acquisition of [tˢ] precedes that of clusters and agrees with studies pointing out that complexity at the level of syllable follows complexity at the level of segment (Lleó & Prinz 1997, Gierut & Champion 1999). In addition, the preference for either the stop or the fricative even to a different degree shows that the direction of syllable structure assignment does not affect the produced consonant in reductions. In contrast, it seems to provide indications in favor of Lombardi's (1990) Unordered Component Hypothesis where the features [-continuant]

[4] Following the methodology of Papadopoulou (2000), as acquired consonants in the present research count these uttered in percentage ≥ 90%.

and [+continuant] of affricates are single-valued and either present or absent with the presence of the former feature to be more systematic than the presence of the latter in this child. Our data also agree with another study on Greek (Kappa 1998) with the difference that affricates in our child emerge only in the intermediate developmental stage and not in the early one, leading to three different strategies being employed for their handling to a different degree, though: deletion, reduction and faithful utterance. Some processes observed, such as deletion and substitution with [tˢ], [dᶻ] in the categories in Table 1 are not discussed since they cannot affect the generalizations deduced between affricates and clusters due to their low frequency of emergence.

One more issue identifed in the child's affricates is that in reductions a harmonized form emerges more frequently, as in (13a-b), than the corresponding non-harmonized one, as in (13c - d), when a [+voiced] consonant is located at distance or nearby:

		Adult's output	→ Child's output	Child: Age
(13)	a.	[ˈtˢa.da]	→ [ˈda.da] 'bag'	Girl: 2;2.2
	b.	[ˈtˢa.da]	→ [ˈða.da] 'bag'	Girl: 2;3.1
	c.	[ˈtˢa.da]	→ [ˈta.da] 'bag'	Girl: 2;2.23
	d.	[ˈtˢa.da]	→ [ˈsa.da] 'bag'	Girl: 2;4.28

In tokens (13a-b), [tˢ] is reduced to the stop or the fricative consonant and then assimilated to the [+voiced] distinctive feature of [d]. As for their frequency, [ˈda.da] appears 19 times over 4 of [ˈta.da] and [ˈða.da] 4 times over 2 of [ˈsa.da]. We assume this happens due to differences in the degree of acquisition between [t] and [d] as well as between [s] and [ð]. More specifically, both stops are always uttered faithfully. However, consonant [d] is produced more often as from 71 cases traced in adult's words, it is uttered 244, while [t] is produced 1956 times out of 1762 cases. These additional utterances arise from other processes such as consonant harmony, that is, the assimilation between two non-adjacent consonants to some or all distinctive features (cf. Pater & Werle 2001: 119, 2003: 385). Between fricatives, the degree of acquisition of [ð] (325 / 533 tokens, 61%) is higher than that of [s] (370 / 810 tokens, 45.7%). Thus, when the appropriate conditions are met, namely, when there is already a [+voiced] consonant in a word that has been acquired by the child, then the harmonized forms are preferred because they include consonants that are used more frequently by the child. One more indicator pointing to this pattern is that assimilations are not applied when [+voiced] consonants located at distance or adjacent to [tˢ] are deleted (examples 14a-c).

		Adult's output	→ Child's output	Child: Age
(14)	a.	[ko.ɾi.ˈtˢa.ci]	→ [i.ˈta.ci] 'girl, diminutive'	Girl: 2;5.15
	b.	[ˈkal.tˢa]	→ [ˈka.ta] 'sock'	Girl: 2;6.27
	c.	[tˢu.ˈli.θra]	→ [su.ˈi.θa] 'slide'	Girl: 2;9.12

Liquids are considered cross-linguistically difficult and among the last categories that emerge and which children acquire, especially [r] (Mann & Hodson 1994, Macken 1995, Magoula 2000, Kappa 2009, Idemaru & Holt 2013, Amoako, Stemberger, Bernhardt & Tessier 2020). The same is true of the present child ([l] 241/749 tokens, 32.2%, [r / ɾ] 39/

519 tokens, 7.5%). It should be noted at this point that [d] and the liquids are the only [+voiced] consonants found in words containing additionally affricates.

Before the analysis of the child's tokens, it should be clarified why examples such as (13a) constitute consonant harmony and not partial or full reduplication. Reduplication is the production of two identical or partially identical syllables and involves consonant or vowel harmony (see Klein 2005: 71), as in examples (15a-c):

	Adult's output	→ Child's output	Child: Age
(15)	a. [dɔr]	→ [dɔdo] 'door'	
	b. [buk]	→ [buku] 'book'	
			(English, Klein 2005: 71, 74)
	c. [pɔ]	→ [pɔpɔ] 'pot'	Child: 1;8
			(French, Ingram 1974: 56)

Two reasons are suggested. First, we agree with the view which supports consonant harmony to take place at the lower levels of prosodic hierarchy, namely, the segment and distinctive feature, while reduplication at the upper levels, that is, the syllable and the *foot* (see for Greek: Tzakosta 2007). Second, for partial reduplication to take place presupposes the deletion of [tˢ] first and according to Table 1, deletion constitutes the last process employed by the child in the intermediate developmental stage. On the other hand, reduction seems to be the favoured process for the handling of affricates. So, we assume in this type of data that it is more likely reduction to stop or fricative to take place initially and after the surviving consonant assimilates the voice of a [+voiced] consonant nearby or at distance.

5. Analysis of the data

5.1 An overview of Maximum Entropy Grammar

Maximum Entropy Grammar (Goldwater & Johnson 2003: 112, Jäger 2007: 470, Hayes & Wilson 2008: 382) constitutes a probabilistic version of Harmonic Grammar (Legendre et al. 1990: 888, Potts et al. 2010: 78) with the difference that the harmony value of candidate outputs is mapped onto probabilities. Harmonic Grammar bears common properties with Optimality Theory (Prince & Smolensky 1993: 2), as in both models outputs corresponding to one input are evaluated based on markedness and faithfulness constraints in order for the optimal output to arise, while the remaining are rejected. However, contrary to Optimality Theory where constraints are strictly ordered and conflicts between them are resolved based on their ranking with the higher ranked to prevail, in Harmonic Grammar constraints are not strictly ranked and have weight that expresses their strength (Legendre et al. 1990: 889). An example containing the basic properties of Harmonic Grammar is illustrated in Table 3 below:

Table 3. Selection of optimal output based on Harmonic Grammar (Flemming 2021: 3)

weights	15	8	8	
/input/	C_1	C_2	C_3	h_i
a	−1			−15
b		−2		−16
c		−1	−1	−16

Violations here are negative integers which state the number of times a constraint is violated by an output. The comparison of outputs lies to the sum of their weighted constraint violations, namely, the harmony which is calculated based on the formula in (16):

(16) $$h_i = \sum_{k=1}^{N} w_k c_{ik}$$

(from Flemming 2021: 4)

N denotes the number of constraints, w_k the weight of constraint k, c_{ik} the violation score of output i by constraint k. In other words, every violation is multiplied by the weight of the respective constraint yielding the score of a candidate. In Table 3, for example, the optimal output is [a] due to its highest harmony.

Maximum Entropy Grammar is considered a stochastic form of Harmonic Grammar, which maps harmonies of outputs onto probabilities, as represented in (17):

(17) $$P_i = \frac{e^{h_i}}{\sum_j e^{h_j}}$$

(Flemming 2021: 5)

P is the probability of output i, h_i its harmony and j ranges over candidate outputs. The probability of output [a] in Table 4, for instance, is e^{-15} divided by $e^{-15} + e^{-16} + e^{-16}$, and the result is 0.58:

Table 4. Probabilities based on Maximum Entropy Grammar (Flemming 2021: 5)

weights:	15	8	8		
/input/	C_1	C_2	C_3	h_i	P_i
a	−1			−15	0.58
b		−2		−16	0.21
c		−1	−1	−16	0.21

The probability of an output is proportional to the exponential of its harmony e^{h_i}. In order for the probabilities of all outputs to sum to 1, the exponential harmony of every output must be divided by the sum of all outputs' exponential harmonies. In conclusion, Maximum Entropy Grammar is a model which depends on information theory. It includes all possible known information provided by the data without making any additional assumptions and it has become a tool for the analysis of *variation* and gradient acceptability in phonology (e.g. Goldwater & Johnson 2003, Flemming 2021). Variation is the utterance of multiple different outputs that correspond to one input.

5.2 Analysis of the affricate [tˢ]

For the different processes used by the child regarding the handling of affricates, the following markedness and faithfulness constraints are adopted: *Complex, which prohibits complex segments (Prince & Smolensky 1993: 96), MAXIMALITY-IO, which demands every segment of the input to have a correspondent in the output and MAXIMALITY-IO (MANNER), which requires every manner of the input to have a correspondent in the output (McCarthy & Prince 1995: 264). There are two possible ways to analyze the tokens: the paper and pencil or the Maxent Grammar Tool (Goldwater & Johnson 2003, Wilson 2006, Hayes & Wilson 2008). For the needs of the present study we will use Maxent Grammar Tool, as it is considered safer than the paper and pencil method as it provides more precise values. Having supplied the software with all the relevant information, the calculation of constraints' weights is the following:

(18) |weights| after optimization:

*Complex	(mu = 0.0, sigma^2 = 100000.0)	0.7470860141085878
MAX-IO	(mu = 0.0, sigma^2 = 100000.0)	1.3347500663429486
MAX-IO (MAN)	(mu = 0.0, sigma^2 = 100000.0)	0.0

An explanation of the calculation of weights with this specific software can be found in Hayes & Wilson (2008). The final results are illustrated in Table 5:

Table 5. Handling of affricates

weights			0.74	1.33	0.0	
/ˈkatˢo/	Observed	Predicted	*Complex	MAX-IO	MAX-IO (MAN)	H
[ˈkato]/ [ˈkaso]	0.57	0.575715518463021	0.0	0.0	-1.0	0.0
[ˈkatˢo]	0.27	0.27274236537402247	-1.0	0.0	0.0	-0.74
[ˈkao]	0.15	0.15154211616295643	0.0	-1.0	-1.0	-1.33

In the first line of Table 5, the weights of constraints are listed with the most important one having the highest value (MAX-IO, 1.33) and less important the lowest value (MAX-IO MAN, 0.0). Constraints with higher weights are more likely to lower the probability of outputs that violate them (e.g. Hayes & Wilson 2008). Further, the prediction of each token's emergence conforms to its frequency. So, the most uttered tokens, which are the ones incurring reduction to stop or fricative consonant (e.g. [kato]/ [kaso]) bear the highest harmony score and, more specifically, 0.0. The less uttered, that is, the ones incurring deletion (e.g. [kao]) present the lowest harmony score (−1.33).

In order for the variation presented in child's reductions to be accounted for, the aforementioned constraints are adopted and the next markedness and faithfulness constraints need to be added: *MARGIN/FRICATIVE, which states that fricatives cannot associate to margin nodes, namely, onset and coda (Prince & Smolensky 1993: 96), AGREE (VOICE), which requires consonants to agree to some distinctive features and for the needs of the present study to voice (Pater & Werle 2001: 123, 2003: 386),

INPUT-CONTIGUITY, which demands the segments of output to form a contiguous string as the corresponding of input (McCarthy & Prince 1995: 371) and IDENTITY-IO, which requires faithfulness in segments to their distinctive features between input and output (McCarthy & Prince 1995: 264). Below, the calculation of each constraint's weight is listed (19).

(19) |weights| after optimization:

*Complex	(mu = 0.0, sigma^2 = 100000.0)	0.0
MAX-IO	(mu = 0.0, sigma^2 = 100000.0)	0.0
MAX-IO (MAN)	(mu = 0.0, sigma^2 = 100000.0)	0.0
*M/FRIC	(mu = 0.0, sigma^2 = 100000.0)	1.4248228310813502
I-CONTIG	(mu = 0.0, sigma^2 = 100000.0)	0.0
AGREE (VOI)	(mu = 0.0, sigma^2 = 100000.0)	1.4248228310814235
IDENT-IO	(mu = 0.0, sigma^2 = 100000.0)	0.0

Each token's emergence frequency is represented in Table 6:

Table 6. Multiple different outputs in reduction

weights			0.0	0.0	0.0	1.42	0.0	1.42	0.0	
/ˈtˢada/	Observed	Predicted	*Complex	MAX-IO	MAX-IO (MAN)	*M/FRIC	I-CONTIG	AGREE (VOI)	IDENT-IO	H
[ˈdada]	0.65	0.6497865227098978	0.0	0.0	−1.0	0.0	−1.0	0.0	−1.0	0.0
[ˈtada]	0.13	0.1563068482527332	0.0	0.0	−1.0	0.0	−1.0	−1.0	0.0	−1.42
[ˈða.da]	0.13	0.1563068482527332	0.0	0.0	−1.0	−1.0	0.0	0.0	−1.0	−1.42
[ˈsada]	0.06	0.03759978078463585	0.0	0.0	−1.0	−1.0	0.0	−1.0	0.0	−2.84

As shown in Table 6, the token most frequently produced by the child ([ˈdada]) bears the highest possible harmony score as the sum of violated constraints is 0.0. The next more systematic produced tokens are [ˈtada] and [ˈða.da], both having −1.42 harmony, while in the least preferred token [ˈsada] the lowest harmony is traced, namely, −2.84. So, in Maximum Entropy Grammar the probabilities of outputs rely solely on their differences in harmony scores (e.g. Hayes & Wilson 2008, Flemming 2021) as has been suggested and can also be seen from Tables 5 and 6. This is the way in which this model can analyze and interpret all processes employed by the child for the treatment of affricates as well as the variation emerging in one process such as reduction.

6. Conclusions

In this paper we focused on the acquisition of affricates in one Greek-speaking child, as we wanted to investigate their phonological status in the underlying representation based on their comparison with clusters containing [stop + fricative]

sequences. All categories present two similarities. First, the most common process in the acquisition of all of them is reduction. Second, in reductions the proportion of stop production over fricative is almost in the same rate, namely, the former is uttered at 63-72% and the latter at 27-36%. However, one crucial difference between [t^s] and [ks], [ps] is observed. The child manages to produce [t^s] faithfully at 27%, while the faithfulness of clusters is 0%. This difference leads to the assumption that affricates are acquired earlier than [stop + fricative] clusters showing that in this child the acquisition of complexity in segments precedes the acquisition of complexity in syllables, as in other researches has been proposed (Lleó & Prinz 1997, Gierut & Champion 1999). In addition, in reductions the preference sometimes of stop and sometimes of fricative seems to be in favor of Lombardi's (1990) view, who considers affricates as complex segments with their features to be unordered and single-valued. In reductions, tokens presenting consonant harmony in voice arise more often than the corresponding ones without harmony, when there is a nearby [+voiced] consonant. The reasons for the emergence of such forms reside in the trigger which is a consonant that has been fully acquired and used systematically in processes such as assimilations, as well as in the degree of acquisition of the consonant that survives, where higher percentages are ascertained in the harmonized [+voiced] than the non-harmonized [−voiced] outputs. For the analysis of this child's tokens, we relied on the statistical framework of Maximum Entropy Grammar, which can model constraint-based phonology. Its basic property is the learning of categorical and stochastic grammars from a training corpus of input-output pairs. In other words, it is supplied by the data and yields results based on different probabilities attributed to outputs. This way, it can adequately account not only for the frequency of different processes the child uses for the handling of affricates but also for the emergence of multiple different outputs in one process, as in the case of reduction. Finally, it should be noted that the conclusions regarding the status of affricates in the underlying representation and their handling concern only this child and cannot be generalized cross-linguistically. For this purpose, a study with more subjects needs to be done so that a clear aspect of them in child speech to have. However, our research provides insights into the various treatments of affricates in case they are not fully acquired by pointing out some processes with their relevant tokens that may be observed in future cross-linguistic studies.

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THE PROCESSING OF GENDER AGREEMENT DURING READING COMPREHENSION IN L2 FRENCH: THE EFFECTS OF SYNTACTIC COMPLEXITY AND WORKING MEMORY

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Abstract: A longstanding debate in L2 research focuses on how syntactic complexity needs to be operationalized to account for L2 performances. Whereas many studies investigated this issue in L2 production, very few studies focused on L2 sentence processing. The present study aimed at investigating the effect of syntactic complexity on gender agreement processing in L2 French, while controlling for the learners' working memory capacity. We tested 37 Dutch learners of French by means of a self-paced reading technique. The results showed decreased sensitivity to gender agreement in embedded structures, but increased sensitivity to gender agreement in non-embedded structures. We concluded that the number of clauses in gender agreement constructions accounts for the effect of syntactic complexity on gender agreement processing in L2 French and that this measure is negatively correlated to sensitivity to gender agreement. We furthermore concluded that (non-verbal) working memory does not affect L2 gender agreement processing.

Keywords: gender agreement, L2 processing, reading, syntactic complexity, working memory

1. Introduction

Defining the construct of complexity has been shown to be very challenging in many studies on second language (L2) acquisition over the past decades since the construct of complexity in L2 research can be interpreted in different ways. In L2 acquisition research the notion of complexity can be used both as an independent and a dependent variable (e.g. Pallotti 2015). Complexity as an independent variable refers to communicative task characteristics which make the task more or less complex, while complexity as a dependent variable refers to the description of L2 performances, often combined with accuracy and fluency, as an indicator of L2 proficiency. In relation to both types of complexity, Pallotti (2015) pointed out that complexity can roughly be interpreted in three ways: inherent complexity, difficulty or cognitive complexity and processing difficulty. Inherent complexity refers to objective structural complexity based on formal properties of the linguistic system (e.g. as an independent variable in communicative tasks) (cf. Pallotti 2009). Difficulty or cognitive complexity deals with the processing costs related to the difficulty of processing linguistic items by L2 learners (e.g. as a dependent variable during sentence processing) (cf. Bulté & Housen 2012). Processing difficulty is related to the developmental order in which grammatical structures are acquired by L2 learners such as the idea that complex structures are acquired late (e.g. as a dependent variable in L2 production) (cf. Ellis 2009). Whereas inherent complexity is concerned with the structural complexity of the linguistic system and builds on the idea that language does not become more complex over time, cognitive complexity and processing difficulty are taken to be more dynamic constructs related to

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L2 processing or production during which (the effect of) complexity changes over time. As such, inherent complexity is related to an interpretation of complexity which is different from interpretations of complexity in terms of difficulty (Bulté & Housen 2012, Pallotti 2015). This does, however, not mean that cognitive complexity could not be related to inherent complexity. The extent to which inherent and cognitive complexity are related is under debate. Indeed, some studies showed that inherent complexity does not fully mirror cognitive complexity as executive functions such as working memory or conflict resolution, have been found to better explain differences in processing costs instead of the inherent complexity of grammatical constructions during sentence processing (see e.g. Fernandez-Duque 2009 for L1 sentence processing, Öttl et al. 2015 for artificial grammar processing, Gilardone et al. 2023 for atypical (L1) sentence processing). This may indicate that inherent and cognitive complexity are indeed two different interpretations of complexity. However, some studies on human language processing showed that cognitive complexity goes hand in hand with inherent complexity in language processing in the sense that syntactically complex constructions require more processing costs than simpler ones (e.g. Ferreira et al. 1996, Traxler et al. 2014), which may indicate that these two interpretations of complexity share a common notion of complexity.

The present study deals with cognitive complexity as a dependent variable and inherent complexity as an independent variable, as it focuses on the cognitive costs involved in the L2 processing of gender agreement constructions manipulated with respect to their inherent complexity.

A subconstruct of inherent complexity is linguistic complexity (Bulté & Housen 2012). This type of complexity refers to the objective structural complexity based on lexical, morphological or syntactic properties of the linguistic system. As such, linguistic complexity has been defined and operationalized using different quantitative measures in L2 research. Bulté and Housen (2018: 149) pointed out that "typically, L2 complexity is operationalized in terms of average length (of different syntactic units), diversity (especially of lexical and/or morphological items) and amount of embedding (at the sentence level)". Of particular interest in the present study is syntactic complexity as a subconstruct of linguistic complexity referring to the objective structural complexity of sentences based on the syntactic properties of the L2. In this respect, the amount of embedding has been operationalized in terms of the number of clauses per sentence and has been most used in L2 research as an objective, quantitative measure of syntactic complexity as compared to the average length of syntactic units (Pallotti 2015). As the focus of the present paper is on syntactic complexity, we will not further discuss the diversity of lexical and/or morphological items as a measure of L2 linguistic complexity.

The aims of the present study are to investigate i.) the potential effect of syntactic complexity on the processing (i.e. the ability of parsing and interpreting morphosyntactic information in sentences) of gender inflection on adjectives in L2 French and ii.) which quantitative measure(s) of syntactic complexity (i.e. the average length of syntactic units and/or the number of clauses per sentence) may account for this potential effect in L2 French.

Previous studies showed that gender inflection on adjectives (i.e. the process by which adjectives agree with a noun and are marked for the noun's gender such as *le*

ballon vert 'the ball.M.SG green.M.SG' vs. *la jupe verte* 'the skirt.F.SG green.F.SG' in French) is prone to errors that persist to an advanced level of proficiency in adult L2 acquisition (e.g. Bril 2016, Bartning 2000, Bril 2021). To account for the difficulty of processing gender inflection in adult L2 the syntactic complexity of noun – adjective agreement structures has been related to inflectional variability in L2 performance (e.g. Bonilla 2015). Bonilla (2015) investigated the L2 learner's development regarding the production of gender inflection on adjectives in Spanish. The results showed that gender inflection in L2 Spanish is first produced in noun – attributive adjective constructions, then in noun – predicative adjective constructions and finally in relativized noun – adjective constructions, indicating that the syntactic complexity of noun – adjective agreement constructions affects the accuracy of gender inflection in the sense that gender inflection is more difficult to correctly produce in complex constructions (i.e. relativized noun – adjective constructions) than in simpler ones (i.e. noun – attributive adjective constructions). Under the view that linguistic competence is taken to have a dual nature comprising the implementation of grammatical knowledge in real-time computation and the production/comprehension of grammatical constructions in communicative contexts (Marinis et al. 2005, Hopp 2006, Foucart 2008), studies on the L2 processing of gender agreement (i.e. the processing of the structural dependency between the noun and the adjective agreeing with the noun in gender) may complement our understanding of operationalizing syntactic complexity and its role in the L2 acquisition of gender inflection. To the best of our knowledge, the potential effect of syntactic complexity on the L2 processing of gender agreement has, however, not been investigated in previous processing research.

Besides linguistic factors, general cognitive abilities such as working memory capacity, have also been related to grammatical processing in L2. Working memory capacity has been defined as 'the ability to maintain and manipulate information in active attention' (Reynolds et al. 2022: 1254, based on Schneider & McGrew 2018). However, previous studies did not show consistent results regarding the role of working memory capacity in grammatical processing in L2. While there seems to be growing evidence that working memory is related to morphosyntactic processing in L2 (e.g. Havik et al. 2009, Reichle et al. 2016, Dracos & Henry 2021; Gabriele et al. 2021), other studies showed that working memory is not associated with morphosyntactic processing during comprehension, i.e. the real-time interpretation of morphosyntactic information (e.g. Rodríguez 2008, Foote 2011, Baek 2012). Therefore, we will also investigate whether the learners' working memory capacity can be taken as a factor for individual variation during gender agreement processing in L2 French.

2. Defining the syntactic complexity of gender agreement constructions in French

As mentioned by Pallotti (2015), previous L2 research has typically taken the average length of syntactic units or the amount of embedding as an objective, quantitative measure of syntactic complexity at the sentence level.

Regarding the average length of syntactic units as a measure of syntactic complexity, this length can be operationalized in terms of the number of words per

constituent or the number of (syntactic) phrases per clause (Pallotti 2015). Based on the operationalizations described in Pallotti (2015), complex structures in L2 are taken to comprise more words per constituent, more phrases per clause or more clauses than simpler structures. With respect to the complexity measure based on the number of words per constituent, noun – attributive adjective gender agreement constructions in French (e.g. *Louise achète une jupe violett**e** dans une boutique* 'Louise buys a purple.F.SG skirt.F.SG in the shop') for instance, consist of 3 words (i.e. *une jupe* (2 words) and *violette* (1 word)), noun – predicative adjective gender agreement constructions (e.g. *La beauté est important**e** pour Claude et moi* 'Beauty.F.SG is important.F.SG for Claude and me') consist of 4 words (i.e. *la beauté* (2 words), *est* (1 word) and *importante* (1 word)) and relativized noun – adjective gender agreement constructions (e.g. *Momo déteste la popularité qui est important**e** à l'école* 'Momo hates the popularity.F.SG which is important.F.SG at school') consist of 5 words (i.e. *la popularité* (2 words), *qui* (1 word), *est* (1 word) and *importante* (1 word)). As such, noun – attributive adjective constructions are considered as less complex than noun – predicative adjective constructions and relativized noun – adjective constructions, and noun – predicative adjective constructions as less complex than relativized noun – adjective constructions (see Bartning 2000 for the same operationalization of syntactic complexity in French gender agreement constructions).

As regards the measure of syntactic complexity based on the number of clauses, both noun – attributive adjective and noun – predicative adjective gender agreement constructions exhibit the same level of syntactic complexity since both constructions yield 1 clause. However, relativized noun – adjective gender agreement constructions yield 2 clauses due to embedding. As such, the latter can be taken as more complex than noun – attributive adjective and noun – predicative adjective gender agreement constructions (see Alarcón 2021 for the same operationalization of syntactic complexity in Spanish adjectival agreement constructions).

The complexity measure based on the number of (syntactic) phrases per clause defines noun – attributive adjective gender agreement constructions as the least complex gender agreement construction in French since they consist of 3 phrases (i.e. DP, NP and AP), whereas noun – predicative adjective gender agreement constructions consist of 4 phrases (i.e. DP, NP, VP and AP) and relativized noun – adjective gender agreement constructions consist of 5 phrases (i.e. DP and NP in the main clause and CP, VP and AP in the embedded clause). The latter taken to be the most complex (see Bril 2021 for the same operationalization of syntactic complexity in French gender agreement constructions). Table 1 gives an overview of the hierarchy of gender agreement constructions in French based on the operationalizations of syntactic complexity described. 1 represents the gender agreement construction exhibiting the lowest level of syntactic complexity, whereas 3 represents the gender agreement construction exhibiting the highest level of syntactic complexity.

Table 1. Hierarchy of gender agreement constructions per measure of syntactic complexity

Type of gender agreement construction	Example	Measure 1 (number of words per constituent)	Measure 2 (number of clauses)	Measure 3 (number of phrases per clause)
Noun – attributive adjective	*Une jupe violett**e***	1	1	1
Noun – predicative adjective	*La beauté est important**e***	2	1	2
Relativized noun – adjective	*La population qui est important**e***	3	2	3

3. Syntactic complexity and working memory in the L2 processing of gender agreement

As mentioned in the introduction, the syntactic complexity of gender agreement constructions has been shown to affect the performance at producing gender inflection in L2. Studies on the L2 processing of gender agreement (e.g. de Jong 2005, Foucart & Frenck-Mestre 2012, Gabriele et al. 2013, Alemán Bañón et al. 2018) reported effects of adjective position on the L2 processing of this type of agreement, which *may* suggest that syntactic complexity also affects the L2 processing of gender agreement. De Jong (2005) for instance, investigated the comprehension and production of noun-adjective gender agreement in L2 Spanish. Dutch learners of Spanish received implicit instruction on a miniature linguistic system targeting gender agreement, followed by a receptive or a receptive-productive training session (or no training in case of the control group). They were tested by means of a self-paced listening test, a match-mismatch test and a grammaticality judgment test to test receptive knowledge, and a picture description task to test productive knowledge. The results showed that both types of training lead to knowledge of gender agreement in comprehension, but much less in production. Regarding the self-paced listening test, the L2 processing of noun - adjective gender agreement revealed to be affected by the position of the adjective. More precisely, longer listening times were found for attributive adjectives as compared to predicative ones. This seems to suggest that the L2 processing of gender agreement is influenced by syntactic complexity in the sense that in more complex constructions (e.g. noun – predicative adjective constructions) gender agreement processing is reflected by shorter reaction times than in simpler constructions (e.g. noun – attributive adjective constructions).

Similar effects of adjective position on noun – adjective gender agreement processing in L2 were reported in studies in which event-related potentials (ERPs) were measured (e.g. Foucart & Frenck-Mestre 2012; Gabriele et al. 2013; Alemán Bañón et al. 2018). ERPs are brain responses which are elicited by linguistic elements of stimuli such as inflections. These responses are a measure of the real-time interpretation of linguistic elements and can be captured by a P600 or a N400 effect. Typically, the P600 is a

positive waveform that shows up when there is a syntactic violation making the sentence ungrammatical, while the N400 is a negative waveform which is elicited by lexical mismatches (e.g. Friederici et al. 1996) or by morphosyntactic violations in early stages of L2 acquisition (McLaughlin et al. 2010). Both ERP effects are taken to reflect high sensitivity to syntactic or lexical violations, while the lack of ERP effects indicates no sensitivity to syntactic or lexical violations (e.g. Gabriele et al. 2013). Foucart and Frenck-Mestre (2012) investigated the processing of gender agreement in native and L2 French by means of an ERP experiment. Participants were presented with grammatical and ungrammatical noun - adjective agreement constructions in which the adjective was in an (prenominal or postnominal) attributive or a predicative position. In the L2 learners group gender agreement violations on postnominal adjectives triggered P600 effect, while violations on prenominal adjectives triggered a N400 effect. In contrast, gender agreement violations on predicative adjectives did not trigger any ERP effect. These results show that L2 learners of French are less sensitive to gender agreement violations on adjectives in a predicative position than in an attributive position, indicating that less attention is paid to gender agreement in predicative adjectives than in attributive ones. In a similar vein, Gabriele et al. (2013) investigated the processing of number and gender agreement in native and L2 Spanish by means of an ERP experiment, while controlling for proficiency. With respect to gender agreement, participants were presented with grammatical and ungrammatical noun – adjective constructions in which the adjective was in an attributive or a predicative position. For the native, intermediate and advanced L2 learners group the ERP results showed that noun – adjective constructions in which the adjective was in an attributive position yielded more P600 effects than noun – adjective constructions in which the adjective was in a predicative position, regardless of the sentences' grammaticality. This means that the predicative position of the adjective reduces the sensitivity to gender agreement in both grammatical and ungrammatical agreement constructions. For low proficient participants, however, this effect of adjective position on sensitivity to gender agreement did not show up. Alemán Bañón et al. (2018) tested native speakers and L2 learners of Spanish with different levels of proficiency in the same type of experiment as in Gabriele et al. (2013). By focusing on number and gender agreement they investigated how morphosyntactic development is modulated by typological similarities and the adjective's position in agreement constructions. In line with Gabriele et al. (2013), the ERP results showed that advanced learners elicited more P600 effects in noun – adjective constructions in which the adjective was in an attributive position as compared to noun – adjective constructions in which the adjective was in a predicative position. As in Gabriele et al. (2013), this effect did not show up in the low proficient learners group. Overall, these findings indicate that the L2 processing of gender agreement is affected by the adjective's position in the sense that noun – adjective constructions in which the adjective is in an attributive position trigger longer reaction times or more P600 effects on the adjective than noun – adjective constructions in which the adjective is in a predicative position. The reason for these findings can be sought in the fact that L2 learning is cognitively more taxing as compared to native language learning. Consequently, they lack the ability to retain linguistic information of the noun in their working memory during gender processing in constructions in which the adjective is separated from the noun, such as by a verb in noun – predicative adjective constructions

(Clahsen & Felser 2006). This means that less attention is paid to gender agreement on adjectives in a predicative position than in an attributive position. While this effect of adjective position on L2 gender agreement processing seems to suggest that the syntactic complexity of gender agreement constructions influences the sensitivity to gender agreement (violations) in L2, the effect of syntactic complexity has, however, not been investigated in previous studies on gender agreement processing in L2.

General cognitive abilities have also been related to the L2 processing of grammatical inflection. Of particular interest in studies investigating morphosyntactic processing in L2 is the learners' working memory capacity (e.g. Sagarra 2007, Havik et al. 2009, Sagarra & Herschensohn 2010). In this respect, working memory concerns the temporary storage and simultaneous manipulation of linguistic information during tasks demanding much cognitive effort such as the processing of linguistic input and is considered as a multicomponent model consisting of the central executive component, the phonological loop, the visuo-spatial sketchpad and the episodic buffer (Baddeley 2003). The central executive component principally deals with attentional control while coordinating and planning linguistic input. The phonological loop and the visuo-spatial sketchpad are considered as temporary store systems for phonological information and visuo-spatial information respectively. The episodic buffer component is principally concerned with the processing and temporary storage of linguistic information from different dimensions. Regarding processing, it assembles linguistic information from different dimensions (e.g. from phonological, visual or semantic representations, and from long-term memory) into a unitary multidimensional representation. Regarding storage, it temporarily stores unitary multidimensional representations of linguistic information during language processing (Rönnberg et al. 2009). As the processing of grammatical inflection involves the temporary storage of the first word of the agreement configuration until the second word is encountered, one may predict that working memory capacity affects the processing of gender inflection in L2. As mentioned in the introduction, an ongoing debate in L2 literature concerns the question of whether working memory constrains morphosyntactic processing in L2. Caplan & Waters (1999) argued that working memory constrains linguistic performances if the meaning of a sentence is used to execute these performances. More precisely, the accuracy of interpreting sentences decreases if working memory capacity decreases as well. However, processes during which syntactic structures need to be assigned to sentences are not influenced by working memory capacity (see also Rodríguez 2008, Foote 2011, Baek 2012). Based on different online (i.e. real-time) measures, recent studies showed contrastive results in the sense that working memory capacity affects the processing of L2 morphosyntax (self-paced reading: Havik et al. 2009, Sagarra & Herschensohn 2010, Dracos & Henry 2021; ERP: Reichle et al. 2016, Gabriele et al. 2021; Eye-tracking: Sagarra 2021). These studies demonstrated that the L2 learners' difficulty to process agreement constructions is due to working memory limitations (Clahsen & Felser 2006). Specifically, learners with decreased working memory capacity can store less linguistic information which leads to more cognitive efforts to process this information. As a result, these increased processing demands affect the implementation of linguistic cues of the first word of agreement dependencies (Hopp 2007). Sagarra (2007) found similar results in English learners of Spanish when focusing on the sensitivity to gender agreement violations. Reading times

collected by means of a self-paced reading experiment showed that learners with higher working memory capacity were more sensitive to gender agreement violations than those with lower working memory capacity (see also Sagarra & Herschensohn 2010 based on the same experimental design as Sagarra 2007). This study also showed an interaction between the effect of working memory capacity and the syntactic complexity of gender agreement constructions. Specifically, the sensitivity to gender agreement violations within the noun phrase (e.g. in attributive constructions) was found to be moderated by working memory, whereas the sensitivity to gender agreement violations across clauses (e.g. in relative constructions) was not. Since syntactic constructions in which gender agreement takes place within the noun phrase can be considered as less complex than those in which gender agreement takes place across clauses, the effect of working memory on L2 gender agreement processing might be mediated by the syntactic complexity of gender agreement constructions.

4. Research questions and hypotheses

The present study deals with the L2 processing of gender agreement in agreement constructions exhibiting different levels of syntactic complexity, while controlling for the learner's working memory capacity. Specifically, we will focus on gender inflection in noun – attributive adjective, noun – predicative adjective and relativized noun – adjective agreement constructions in French. We addressed the following research questions:

RQ1: Does syntactic complexity affect the processing of gender agreement in Dutch intermediate L2 learners of French during reading comprehension?
RQ2: If yes, which quantitative measure(s) of syntactic complexity account(s) for this effect in L2 French?
RQ3: Does working memory affect the processing of gender agreement in Dutch intermediate L2 learners of French during reading comprehension?

Based on previous studies on syntactic complexity, gender agreement processing and the role of working memory in gender agreement processing in L2, we hypothesized that

(i) the L2 processing of gender agreement reveals shorter reaction times in relativized noun – adjective agreement constructions than in noun – attributive adjective and noun – predicative adjective agreement constructions (De Jong 2005, Clahsen & Felser 2006, Pallotti 2015),
(ii) the L2 processing of gender agreement reveals shorter reaction times in noun – predicative adjective agreement constructions than in noun – attributive adjective agreement constructions, based on the complexity measures in terms of the number of words per constituent and the number of (syntactic) phrases per clause (De Jong 2005, Clahsen & Felser 2006, Foucart & Frenck-Mestre 2012, Gabriele et al. 2013, Pallotti 2015, Alemán Bañón et al. 2018),
(iii) the L2 processing of gender agreement reveals equal duration of reaction times in noun – predicative adjective agreement and noun – attributive adjective agreement constructions, based on the complexity measure in terms of the number of clauses per sentence (Pallotti 2015), and that

(iv) working memory affects the L2 processing of gender agreement in French during reading comprehension in noun - attributive and noun – predicative adjective agreement constructions and does not in relativized noun – adjective agreement constructions (Sagarra 2007).

5. Method

5.1 Participants

Thirty-seven Dutch learners of French (M_{age} = 17.7 years; SD_{age} = 4.3) took part in this experiment. Bilingual learners were excluded to avoid transfer effects from other languages than Dutch. By bilingual learners we mean language learners who acquired more than one language during early childhood and use both languages in their everyday lives (Grosjean 2008). They were all enrolled in French language classes for 5 to 7 years and were at an intermediate (B1 or B2) level of proficiency, which was tested by means of a standardized reading test. As proficient L2 learners have been shown to be sensitive to the effect of adjective position on L2 gender agreement processing (Gabriele et al. 2013' Alemán Bañón et al. 2018), this population can be taken as appropriate for this experiment. All participants confirmed that they had no language disorder such as dyslexia, and gave written informed consent for the experiment. They did not receive any information about the purpose of this study.

5.2 Materials and procedures

The materials consisted of a self-paced reading task to measure the speed of processing gender inflection and a forward-backward digit span task to measure the learner's working memory capacity. All data and experimental stimuli are available in the OSF repository at https://osf.io/m7xfh/?view_only=29d90e1025a04ca5909aabba4ab9dee4.

5.2.1 Self-paced reading task

The self-paced reading task was based on a non-cumulative moving window technique (Just et al. 1982) which has been shown to be appropriate to measure the L2 processing of inflectional morphology in previous studies (e.g. Hopp 2006, Jackson 2008; Pliatsikas & Marinis 2013). In the present experiment this technique provides the reaction time on the adjective which is assumed to reflect the sensitivity to gender agreement during the processing of the adjective combined with the structural dependency between the noun and the adjective agreeing with the noun in gender. Each segment comprises one word (determiners are integrated in the same segment as the noun (see Pan & Felser 2011 for instance)). Participants are presented with the test stimuli word-by-word on a computer screen and need to push on a pacing button once they have read the segment's word.

In this study the experimental items consisted of 75 stimuli which were categorized in 3 types of gender agreement constructions (i.e. noun – attributive adjective, noun – predicative adjective and relativized noun – adjective agreement constructions), resulting

in 25 stimuli per category. This categorization was based on the level of syntactic complexity of these gender agreement constructions as shown in section 2. Furthermore, 15 filler items targeting other grammatical elements than gender agreement were added. All items were created in accordance with the criteria described in Jegerski (2014). As such, each sentence contained 6 à 8 segments of which 1 contained a noun and 1 contained an adjective (e.g. for noun – attributive adjective constructions : *Louise / achète / #une jupe / #violette / dans / une boutique*, for noun – predicative adjective constructions: *La beauté / #est / #importante / pour / Claude / et / moi* and for relativized noun – adjective constructions: *Momo / déteste / la popularité / qui / #est / #importante / à / l'école*). Pronoun – adjective constructions (e.g. *elle est importante* 'she.F.SG is important.F.SG') were not used in our experiment. The # indication shows the regions of measurement. In each test item processing speed was measured in both the adjective segment and the segment preceding the adjective (i.e. a noun in the noun – attributive adjective construction and *est* 'is' in the noun – predicative adjective and the relativized noun – adjective constructions). As the segment preceding the adjective is not comparable across conditions (*est* vs. a noun), we only focused on the processing of *est* in the noun – predicative adjective and the relativized noun – adjective construction in order to ensure that potential differences in reaction times on the adjective between experimental conditions are exclusively related to effects of syntactic complexity on the processing of gender agreement. As such, the segment preceding the adjective (i.e. *est*) is a control segment by which latencies on the adjective may exclusively be related to effects of syntactic complexity on gender agreement (see Sagarra & Herschensohn 2010 for the same procedure). Furthermore, we did not focus on the potential effect of working memory on the processing of the segment preceding the adjective. With respect to the noun, all nouns were inanimate and in a feminine singular context. Masculine contexts were avoided because these contexts lack overt gender inflection on the adjective in French (e.g. *le ballon vert-ø* 'the ball.M.SG green.M.SG' vs. *la jupe violett-e* 'the skirt.F.SG purple.F.SG'). As correct gender assignment (i.e. categorizing a noun in a gender class such as masculine or feminine in French) has been shown to be a prerequisite for accurate gender agreement (Hopp 2016), gender was expressed by an overt determiner so that gender agreement processing was not affected by incorrect gender assignment. The noun's segment did not contain determiners in which elision (i.e. the suppression of unstressed vowels in French such as *l'* 'the') has taken place. Regarding the adjective, all adjectives contained 1 to 4 syllables and exhibited regular overt gender inflection ending in *-e* (e.g. *la jupe violette* 'the skirt.F.SG purple.F.SG'). Adjectives exhibiting stem alternations such as *beau* 'nice.M.SG' vs. *belle* 'nice.F.SG', or those derived from other lexical categories such as *travailleur* 'diligent.M.SG' vs. *travailleuse* 'diligent.F.SG', were not included in the experimental items. The adjectives included did not differ with respect to the number of syllables across experimental conditions ($X^2(2) = 1.38$; $p = .50$). This means that the length of adjectives varies to the same extent across conditions. Furthermore, only phonologically expressed gender inflection on adjectives was used to avoid effects of phonological cues on processing speed (as shown in Carrasco-Ortiz & Frenck-Mestre 2014). To minimize the effect of word frequency on L2 processing during reading comprehension (as shown in Kim & Kim 2012) all adjectives included were based on the Brunet (2014)'s corpus for word frequency in French and did not show

differences in word frequency across experimental conditions ($F(2,26) = 2.21$; $p = .13$). This means that the frequency of adjectives varies to the same extent across conditions. With respect to the noun – attributive adjective condition, all adjectives were in a postnominal position since previous research demonstrated that the L2 processing of gender inflection is affected by the (postnominal vs. prenominal) position of the adjective (Foucart & Frenck-Mestre 2012). Since the adjective segment was controlled for length, frequency and phonological expression of gender inflection, differences in reaction times on the adjective segment may be related to the processing of gender agreement.

To collect the reaction times in the regions of measurement self-paced reading software (ZEP) was installed on a Linux computer. In a quiet classroom, participants were seated in front of a computer screen on which the test stimuli were presented segment-by-segment. They proceeded to the next segment by pressing on a button box. During short instruction participants were told to press the button at their own pace. Before the task started 4 practice stimuli were presented so that participants were familiar with the experiment. After these practice stimuli each participant was presented with all experimental items (i.e. items from all experimental conditions) and these items were presented using one and the same self-paced reading task in which the presentation order was counterbalanced for each participant. A yes-no comprehension question showed up after a random set of stimuli to verify whether participants paid attention to these stimuli. Answers were used to check whether all participants understood the sentences. All participants finished the task well within 20 minutes.

5.2.2 Forward-backward digit span task

The participants' working memory capacity was measured by means of a forward-backward digit span task. This task was part of the WISC intelligence test (Wechsler 2003) and has been shown to highly predict L2 reading comprehension (Kormos & Sáfár 2008). Since other working memory tasks such as non-word repetition tasks and reading span tasks (e.g. Daneman & Carpenter 1980), seem to measure proficiency and experience rather than the learners' working memory (MacDonald & Christiansen 2002), a forward-backward digit span task has been used as an appropriate task to measure working memory capacity in previous studies (e.g. Kormos & Sáfár 2008, Juffs & Harrington 2011). In this task, a series of digits (i.e. numerals) was orally presented to the participants and they were asked to reproduce the digits. Each digit was 1 second in duration and was presented once. In case of the forward version, participants needed to reproduce the digits in the same order, while in case of the backward version, participants needed to reproduce the digits in reverse order. The first series comprised 2 digits and the last one comprised 9 digits for the forward version and 8 digits for the backward version (per 2 trials the series increased with 1 digit). The measure of working memory capacity was defined as the highest number of correctly reproduced series. All participants were in a quiet classroom and the task was administered by one of the researchers.

5.3 Data analysis

As mentioned in section 5.2, reaction times were collected on both the adjective segment and the segment preceding the adjective. These reaction times (in milliseconds) were defined as the time lapse between the segment's onset and the button press, which reflects the speed of processing the segment under investigation. Based on predetermined cut-off points for non-native speakers, reaction times lower than 200 milliseconds (as in Luce 1986) and higher than 4000 milliseconds (as in Havik et al. 2009) were removed. For each participant the mean of reaction times were calculated per segment of measurement for each experimental condition. Per condition and segment of measurement the data were inspected for outliers. Outliers were removed by winsorizing the data. This means that outliers were replaced with the lowest or highest value that is not an outlier (see Field 2013). The data were analyzed by means of a mixed ANCOVA to detect differences in reaction times between the types of agreement constructions on both the adjective segment and the segment preceding the adjective (see Bril et al. 2021 for the same statistical analysis used in a self-paced listening study on syntactic complexity and reaction times in L2 listening). The dependent variable was the reaction time in milliseconds per segment, the independent within-subjects variable was the Segment of Measurement yielding 2 levels: the segment preceding the adjective and the adjective segment. The independent between-subjects variable was Sentence Type (i.e. the type of agreement construction) containing 3 levels: noun – attributive adjective, noun – predicative adjective and relativized noun – adjective constructions. To account for potential mediating effects of working memory, the scores of the forward-backward digit span task were included as a covariate. For an ANCOVA the covariate and the between-subjects variable need to be independent to avoid reduction of the experimental effect (Wildt & Ahtola 1978). Since the working memory scores were equal for all sentence types (i.e. each participant performed all sentence types), these scores did not affect the potential effect of Sentence Type across conditions and can therefore be considered as independent of the Sentence Type variable. Following the procedures described in Field (2013), the assumption of homogeneity of regression slopes was tested and did not reveal to be violated ($F(2,102) = .43$; $p = .65$). Except the reaction times on the segment preceding the adjective in the noun – attributive adjective condition, all segments of measurement were non-parametric ($p < .05$) and violated the assumption of normality. Since ANCOVA is robust for non-normality if group sizes are equal (Donaldson 1968), this statistical analysis can be taken as appropriate for data analysis. Post-hoc contrast analyses with Bonferroni correction were run to detect differences in reaction times between types of agreement constructions and segments of measurement. For all statistical analyses the α level of significance was .05.

6. Results

Table 2 displays the descriptive data of reaction times per segment of measurement and sentence type, and the working memory scores. As the data were found to be non-parametric, 5 parameter statistics were reported. These data are set out in Figure 1 and 2.

Table 2. Descriptive data of reaction times (in milliseconds) per segment and sentence type, and working memory scores

	Segment	Sentence type	*Min*	*Lower quartile*	*Median*	*Upper quartile*	*Max*
Reaction times	Segment preceding adjective	noun-attributive adjective	313.00	481.78	674.80	1304.82	2194.00
		noun-predicative adjective	270.00	421.12	524.44	722.78	955.32
		relativized noun-adjective	253.96	389.56	484.04	687.68	1036.16
	Adjective	noun-attributive adjective	339.64	477.26	654.28	954.78	1461.76
		noun-predicative adjective	273.68	485.82	637.56	908.32	1492.88
		relativized noun-adjective	284.20	423.14	562.08	873.12	1477.44
Working memory			12.00	16.25	20.00	23.00	27.00

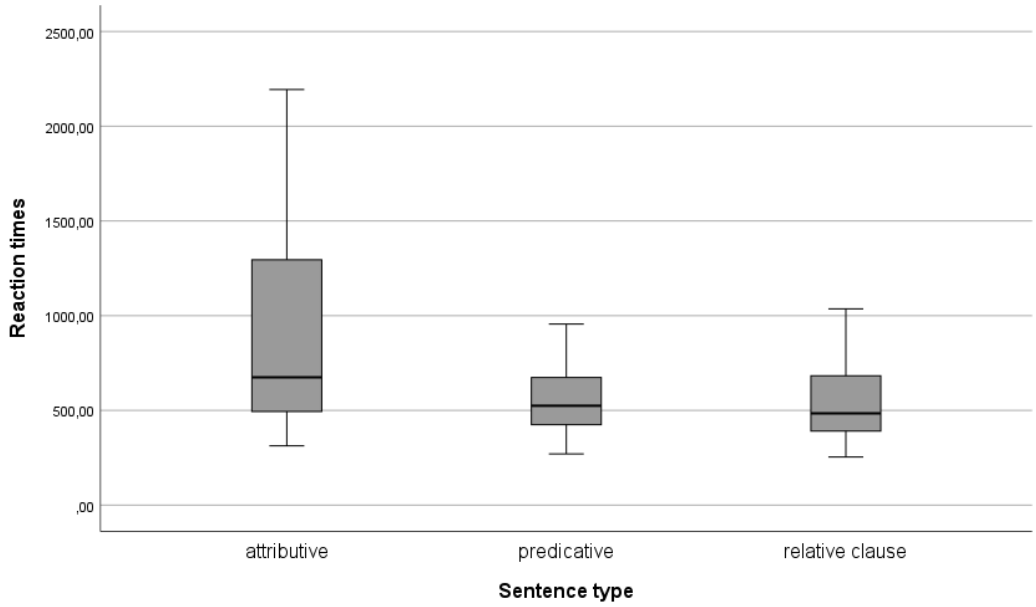

Figure 1. Mean reaction times (in milliseconds) on preceding segment per sentence type

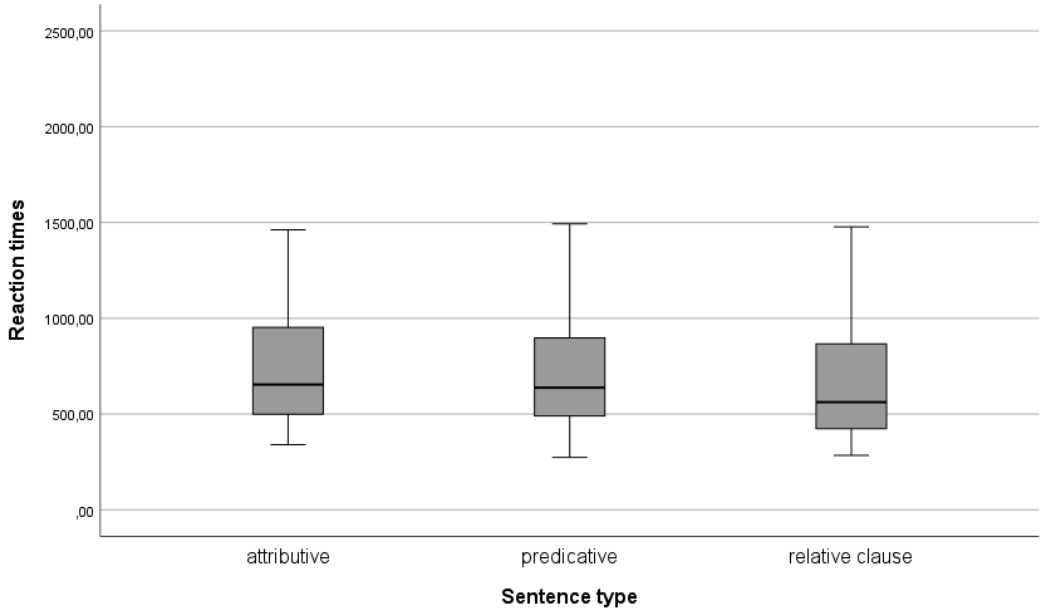

Figure 2. Mean reaction times (in milliseconds) on adjective per sentence type

The ANCOVA revealed a main effect for Sentence Type ($F(2,104) = 4.85$; $p = .01$; $\eta^2 = .09$). Bonferroni post-hoc analyses showed that reaction times in noun – attributive adjective constructions (e.g. *une jupe violette* 'a purple.F.SG skirt.F.SG') were longer than in noun – predicative adjective (e.g. *la beauté est importante* 'beauty.F.SG is important.F.SG') ($t(104) = 2.41$; $p = .05$; $r = .23$) and relativized noun – adjective constructions (e.g. *la popularité qui est importante* 'the popularity.F.SG which is important.F.SG') ($t(104) = 2.91$; $p = .01$; $r = .27$). However, reaction times in noun – predicative adjective constructions vs. relativized noun – adjective constructions did not differ ($t(104) = .51$; $p = 1.00$; $r = .05$). No main effect was found for Segment of Measurement ($F(1,104) = .001$; $p = .98$; $\eta^2 = .00$), indicating that reaction times did not differ between the adjective segment and the segment preceding the adjective. Furthermore, working memory capacity was not found to modulate the reaction times ($F(1,104) = .101$; $p = .75$; $\eta^2 = .001$). Interaction between Segment of Measurement and Sentence Type turned out to be significant ($F(2,104) = 25.32$; $p < .001$; $\eta^2 = .33$). This means that differences in reaction times between sentence types differed between segments of measurement. More precisely, contrast analyses showed that reaction times on the adjective segment significantly differed between noun – predicative adjective and relativized noun – adjective constructions ($t(104) = 3.89$; $p < .001$; $r = .36$), and noun – attributive adjective and relativized noun – adjective constructions ($t(104) = 4.53$; $p < .001$; $r = .41$). The reaction times measured on the adjective in predicative and attributive constructions were longer than those measured on the adjective in relative constructions. In contrast, no significant difference was observed in reaction times on the adjective segment between noun – attributive adjective and noun – predicative adjective constructions ($t(104) = .84$; $p = .39$; $r = .08$). Regarding the segment preceding the

adjective, we only focused on noun – predicative adjective and relativized noun – adjective constructions (as mentioned in section 5.2). A contrast analysis showed that the reaction times on the segment preceding the adjective did not significantly differ between these constructions ($T = 233.00$; $p = .07$; $r = .21$).

7. Discussion

As mentioned in Section 5.2, we focused on the segment preceding the adjective (*est* 'is') to ensure that differences in reaction times on the adjective segment are exclusively related to the processing of gender agreement. Since the significant main effect of Sentence Type is based on an overall effect (i.e. including both the segment preceding the adjective and the adjective segment) of types of agreement constructions on reaction times, this effect is not exclusively related to the processing of gender agreement. To focus on the processing of gender agreement we need to look at the Segment of Measurement x Sentence Type interaction and focus on the contrast analyses run on the adjective segment. This interaction revealed a medium-sized effect, indicating that this effect was robust (Cohen 1988). These results showed that reaction times in processing (noun – adjective) gender agreement in L2 French were shorter in relativized noun – adjective constructions as compared to noun – predicative adjective and noun – attributive adjective constructions, which confirms our first hypothesis. The effect sizes for both contrast analyses revealed to be medium. However, no difference in reaction times was observed between noun – predicative adjective and noun – attributive adjective gender agreement constructions. The effect size for this contrast analysis was small, which indicates that this difference was not robust. This does not confirm our second hypothesis predicting shorter reaction times in noun – predicative adjective constructions as compared to noun – attributive adjective constructions. Instead, this finding confirms our third hypothesis predicting equal duration of reaction times in both constructions. Regarding working memory, no effect of the learners' working memory capacity was found on the processing of (noun – adjective) gender agreement. Although this observation revealed a small-sized effect, this means that the fourth hypothesis predicting that working memory modulates the L2 processing of gender agreement during reading comprehension in noun – attributive and noun – predicative adjective agreement constructions cannot be confirmed by the results of this study.

We also analyzed the segment preceding the adjective in noun – predicative adjective and relativized noun – adjective constructions as a control segment (i.e. *est* 'is'). Whereas the reaction times measured on the adjective segment differed between both types of constructions, those measured on the segment preceding the adjective did not significantly. Although the effect size for this contrast analysis was small, this indicates that differences in reaction times measured on the adjective segment are related to noun – adjective gender agreement (since we controlled for the adjective's frequency, position, length in terms of syllables and the phonological expression of gender inflection across experimental conditions). As defined in section 2, relativized noun – adjective gender agreement constructions can be considered as more complex than noun – predicative adjective and noun – attributive adjective gender agreement constructions in French.

Whereas the measure of syntactic complexity based on the number of clauses per sentence predicted the same level of syntactic complexity in noun – predicative adjective and noun – attributive adjective gender agreement constructions in French, the measures of syntactic complexity based on the number of words per constituent or the number of (syntactic) phrases per clause predicted a higher level of syntactic complexity for noun – predicative adjective gender agreement constructions as compared to noun – attributive adjective ones in French. Based on the results found in our experiment, the number of clauses per sentence may be taken as an appropriate quantitative operationalization of syntactic complexity in relation to the processing of noun – adjective agreement constructions in L2 French. This means that syntactic complexity affects the L2 processing of (noun – adjective) gender agreement in the sense that the processing of gender agreement in non-embedded constructions triggers longer reaction times, indicating more sensitivity to gender agreement, than in embedded constructions. For L2 French we, thus, argue that embeddedness may account for the effect of syntactic complexity on the processing of (noun – adjective) gender agreement and that the level of syntactic complexity based on the number of clauses in gender agreement constructions is negatively correlated to the learners' sensitivity to noun - adjective gender agreement. It is important to mention that these results may not be found in low proficient learners of French, as this population has been shown to be less sensitive to gender agreement in L2 than intermediate learners (Gabriele et al. 2013, Alemán Bañón et al. 2018). As our results show longer reaction times on the adjective in noun – attributive adjective and noun – predicative adjective gender agreement constructions in French (as compared to relativized noun – adjective constructions), the L2 population under investigation may be assumed to be more sensitive to noun – adjective gender agreement in these constructions than to noun – adjective gender agreement in relativized noun – adjective constructions. This contrasts with previous studies on the L2 learners' sensitivity to noun – adjective gender agreement (e.g. de Jong 2005, Foucart & Frenck-Mestre 2012, Gabriele et al. 2013; Alemán Bañón et al. 2018) which showed that L2 learners are more sensitive to gender agreement on adjectives in an attributive position than in a predicative position. Although there was a small-sized effect, our experiment showed an equal level of sensitivity to gender agreement in these constructions in L2 French, but a reduced level of sensitivity to gender agreement in embedded constructions. This contrast may be explained by the research method used in Foucart and Frenck-Mestre (2012), Gabriele et al. (2013) and Alemán Bañón et al. (2018). Whereas these studies used the ERP technique to measure the L2 processing of noun – adjective gender agreement, we used the self-paced reading technique. Although both methods have been shown to be appropriate to measure the L2 processing of gender agreement, ERP is principally used to provide insights into the ongoing neurocognitive processes involved in processing L2 gender agreement and reflects immediate neural responses. Self-paced reading, however, is used to measure the L2 learner's processing efficiency during reading comprehension and provides the processing costs involved in processing L2 gender agreement. As such, the cognitive processes indexed by these two online measures are different and tap into different types of processing (e.g. Ditman et al. 2007). In self-paced reading experiments the processing of gender agreement spills over to the next segment in the sentence due to the participant's fixed button-press pace (Mitchell 2004). Participants may therefore press

the button before gender agreement has completely been processed, which affects the reaction times measured. As ERP reflects immediate responses and does not detect spill-over, ERP measures of gender agreement processing may differ from self-paced reading measures (cf. Bicknell et al. 2010 in which different results from self-paced reading vs. ERP were reported for noun-verb constructions), resulting in the contrast between the results found in Foucart & Frenck-Mestre (2012), Gabriele et al. (2013) and Alemán Bañón et al. (2018), and our results when it comes to the L2 processing of gender agreement on adjectives in attributive vs. predicative positions. Further research needs to focus on these potential differences between ERP and self-paced reading in measuring the L2 processing of (noun – adjective) gender agreement. In addition to these ERP studies, our results also contrast with De Jong (2005) in which longer reaction times on adjectives were found in attributive constructions as compared to predicative ones. Since De Jong (2005) focused on the processing of (noun – adjective) gender agreement in L2 Spanish, the perceptual salience of gender inflection in Spanish may have affected the learners' sensitivity to this type of agreement. Renaud (2014) for instance, investigated the processing of gender agreement in intermediate to advanced L2 learners of Spanish and French by means of a self-paced reading experiment and an acceptability task. The experiment focused on anaphoric adjective agreement in superlative constructions such as *el más sucio* 'the.M.SG most dirty.M.SG' vs. *la más sucia* 'the.F.SG most dirty.F.SG' for Spanish and *le moins lourd* 'the.M.SG least heavy.M.SG' vs. *la moins lourde* 'the.F.SG least heavy.F.SG' for French. Regarding the comparison between L2 learners of Spanish and French, the results showed more robust grammatical knowledge of gender agreement in the L2 Spanish group than in the L2 French group. The author concluded that this contrast may be explained by differences in the perceptual salience of gender agreement on adjectives, since Spanish exhibits more salient gender inflection on adjectives than French. This may also be an explanation for the contrast found between De Jong (2005) and the results found in the present study. A question for further research could be to investigate to what extent perceptual salience mediates the effect of syntactic complexity on the processing of (noun – adjective) gender agreement in L2 French.

As mentioned in the introduction, a central question in L2 studies is to define and operationalize the construct of complexity. Based on our results from L2 French, we suggest that, to some extent, syntactic complexity being a subconstruct of inherent complexity may be related to the cognitive complexity of (noun – adjective) gender agreement constructions in L2 French. More specifically, the cognitive complexity of this type of agreement construction by L2 learners of French may be related to (non-) embeddedness in (noun – adjective) gender agreement constructions. This is in line with the fact that the number of (embedded) clauses is the quantitative operationalization of syntactic complexity that is most used in L2 research (Pallotti 2015) as compared to other operationalizations of syntactic complexity in L2 research such as the number of words per constituent or the number of syntactic phrases per clause. As no difference in reaction times was observed between noun – predicative adjective and noun – attributive adjective gender agreement constructions, syntactic complexity was not found to fully mirror cognitive complexity in our experiment, which may indicate that syntactic complexity can be related to a slightly different interpretation of complexity in L2 acquisition, as compared to cognitive complexity.

Regarding working memory capacity, the results showed no effect of the learners' working memory capacity on the processing of gender agreement in noun – attributive adjective and noun – predicative adjective gender agreement constructions. In contrast to previous studies (e.g. Havik et al. 2009, Sagarra & Herschensohn 2010, Dracos & Henry 2021) in which working memory was demonstrated to affect L2 morphosyntactic processing, our findings are in line with studies (e.g. Caplan & Waters 1999, Foote 2011, Baek 2012) in which working memory was shown to not affect structural processing in L2. As described in section 3, these studies showed that the L2 learners' working memory capacity only affects sentence processing when meaning is necessary to interpret these sentences such as animacy processing. Although our results did not show an effect of working memory on the L2 processing of gender agreement, these results need to be interpreted carefully as only one measure of working memory capacity was included in the present study. Within the context of language-related cognitive abilities, research on working memory often distinguishes between non-verbal and verbal working memory (e.g. White 2021). Whereas non-verbal working memory involves the temporal storage of digits while processing a non-verbal task such as arithmetic, verbal working memory involves the temporal storage of verbal units such as words or letters. In research on language interpretation an ongoing debate concerns the question of whether working memory needs to be considered as a cognitive system separate from other cognitive processes involved in language processing (e.g. Just & Carpenter 1992) or as a cognitive system equating to experience in language processing (e.g. Macdonald & Christiansen 2002). Based on the results of the present study, working memory considered as a separate cognitive system such as non-verbal working memory, has been found to not affect the processing of (noun – adjective) gender agreement in L2 French. As a non-verbal working memory task was used in this study, adding a verbal working memory task such as a reading span task, to future studies may complement our understanding of the role of working memory in the L2 processing of gender agreement.

A limitation of the present study is that few fillers have been used in the self-paced reading task. As such, participants may have known the purpose of the task. Although no research has been done on the potential effect of experimental item – filler ratio on reaction times in self-paced reading, Marsden et al. (2018) recommend a 1:1 experimental item – filler ratio in this particular task. Another limitation is that there were no stimuli containing noun – adjective gender agreement violations included in the experiment. In addition to the inclusion of the segment preceding the adjective and control for the adjective's frequency, the number of syllables, the phonological expression of gender inflection and the adjective's position in the sentence, the inclusion of this type of stimuli would have been an additional control condition to ensure that differences in reaction times are exclusively related to gender agreement processing.

8. Conclusions

In this study we investigated the role of syntactic complexity in the processing of (noun – adjective) gender agreement in L2 French, while controlling for the learners' working memory capacity. By means of a self-paced reading technique we tested

intermediate Dutch learners of French with respect to their performances at processing gender agreement in sentences exhibiting different levels of syntactic complexity. The results showed decreased sensitivity to gender agreement in embedded structures, but increased sensitivity to gender agreement in non-embedded structures. Based on these results, we may conclude that the quantitative measure of syntactic complexity based on the number of clauses in gender agreement constructions is an appropriate operationalization to account for effects of syntactic complexity on the L2 processing of (noun – adjective) gender agreement and that this measure is negatively correlated to sensitivity to gender agreement. Furthermore, we may conclude that (non-verbal) working memory does not affect the processing of gender agreement in L2 French.

Abbreviations

F	Feminine
M	Masculine
SG	Singular

Ethics and consent

This study has received approval from the Ethical Assessment Committee Linguistics – reference number: 'BRIL'0002-07-2019. Participants of this study gave written informed consent.

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ANIMACY IN THE ACQUISITION OF DIFFERENTIAL OBJECT MARKING BY ROMANIAN MONOLINGUAL CHILDREN

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Abstract: Differential object marking (DOM) has been shown, in an impressive number of production studies, to be acquired by monolingual children at around age 3. The picture which emerges from comprehension data, however, reveals that DOM is an area of vulnerability in L1 acquisition. This study investigates the acquisition of DOM by monolingual Romanian children using a preference judgment task. 80 monolingual Romanian children (aged 4;04-11;04) and a control group of 10 Romanian adults took part in the study. Results show that DOM is vulnerable and trace this vulnerability to the animacy feature. Romanian children incorrectly overgeneralize DOM to inanimate proper names and inanimate descriptive DPs until age 9. The vulnerability of animacy is predicted by its variable behaviour with respect to object marking as well as by the current increase in the use of clitic doubling, a DOM marker less sensitive to animacy. On the learnability side, we account for the findings in terms of Biberauer & Roberts' (2015, 2017) Maximize Minimal Means model. We suggest that, in accordance with the Feature Economy bias, Romanian children first identify only the role of referential stability (which has more robust cues in the input) and consider the possibility of animacy as a relevant feature later. In line with the Input Generalization bias, children maximize the role of referential stability which results in overgeneralization of DOM to inanimate objects, especially to inanimate proper names.

Keywords: differential object marking, animacy, overgeneralization, L1 acquisition, Romanian

1. Introduction

Differential object marking (DOM) is the phenomenon whereby highly prominent or highly individuated direct objects are differentially marked. Several features have been identified as triggers of DOM across languages, among which animacy, definiteness, specificity, referential stability, affectedness, telicity, topicality (Bossong 1991, 1998, Aissen 2003, Naes 2004, von Heusinger et al. 2008, a.o.). According to Bossong (1998), differential marking involves exclusively morphological marking. Other authors argue that DOM is a universal phenomenon (Carnie 2005, Rodríguez-Mondoñedo 2007, 2008) and that marking may also be syntactic, i.e. highly prominent or highly individuated direct objects can be assigned a distinct syntactic position.

Full acquisition of DOM involves the identification of morphological, syntactic, semantic and pragmatic properties which constrain object marking and which are subject to cross-linguistic variation. In spite of the complexity of the phenomenon, however, an increasing number of studies have been providing data which show that DOM is mastered surprisingly early. Rodríguez-Mondoñedo (2008) was the first to provide such data. His analysis of DOM use by Spanish-acquiring children convincingly revealed early acquisition, before age 3. Similar results were reported for Croatian and Russian (Hržica et al. 2015), Estonian (Argus 2015, Vihman et al. 2020), Hebrew (Uziel-Karl 2015),

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Korean (Chung 2020), Lithuanian (Dabašinskienė 2015), and Turkish (Ketrez 1999, 2006). All these early studies, however, relied exclusively on production data, many coming from longitudinal corpora (see Avram 2015, Parodi & Avram 2018, and Mardale & Montrul 2020 for surveys of the literature).

Comprehension studies based on experimental data reveal a totally different picture. Ketrez (2015) shows that young children acquiring Turkish have problems, as late as age 6, with the comprehension of the scope properties of Accusative-marked and unmarked objects. Other recent comprehension data for DOM in child Spanish (Guijarro-Fuentes et al. 2017) and in child Hebrew (Plaut & Hacohen 2022) indicate a similar production-comprehension asymmetry. DOM is attested early in production (though it may not be found in all possible contexts) but comprehension data indicate a significant acquisition delay. Such results reveal the limitations of production studies and suggest that extending the investigation to comprehension might contribute to a more fine-grained picture of the L1 acquisition of DOM.

For Romanian, the few available L1 studies (Ticio & Avram 2015, Avram & Tomescu 2020) report early emergence and early acquisition. By age 3, Romanian-speaking children use DOM correctly but this early use is restricted to definite objects. The production data clearly show that DOM is used correctly early but they do not cover DOM in all available contexts. Given the mismatch between DOM production and comprehension in child Turkish, Spanish and Hebrew, one can assume that a similar asymmetry might characterize the acquisition of DOM in other languages. The data on DOM in L1 Romanian come exclusively from production. The present study extends the investigation to the comprehension of DOM in L1 Romanian.

In Romanian, DOM is constrained by referential stability and animacy (Tasmowski 1987, Cornilescu 2000, Farkas & von Heusinger 2003, Mardale 2007, 2008, Tigău 2011), with animacy being the weaker (Irimia 2020) or the less stable trigger (Avram & Zafiu 2017). Though generally DOM with inanimate objects is incorrect, there are various configurations which allow or require DOM irrespective of whether the direct object is or is not animate. In spite of this variable behaviour, animacy has been shown to be integrated early in the DOM system in L1 acquisition; DOM overextension to inanimate objects is either not attested or extremely rare (Ticio & Avram 2015, Avram & Tomescu 2020). In this study we use experimental data to probe into the acquisition of the role of the animacy feature in the DOM system of Romanian.

The remainder of the paper is organized as follows. Section 2 offers a brief description of the Romanian DOM system, with a focus on the role of animacy. In section 3 we briefly review previous studies on the L1 acquisition of DOM which reveal the production-comprehension asymmetry mentioned above as well as previous studies which investigate DOM in L1 Romanian. Our experimental study on the comprehension of DOM in L1 Romanian is presented in section 4. Section 5 summarizes the main findings.

2. DOM in Romanian

Romanian has two overt differential markers, the (functional) preposition or case marker *pe* (the analysis varies from one author to another) (Tasmowski 1987, Dobrovie-Sorin

1994, Cornilescu 2000, Farkas & von Heusinger 2003, Mardale 2007, Tigău 2011, Hill & Mardale 2021, a.o.) and clitic doubling (which involves *pe* and a doubling Accusative clitic) (Bossong 1998, Mardale 2007, Tigău 2011, Hill & Mardale 2021, a.o.) (see 2).

(1) A vizitat **pe** vecinul de la parter.
has visited PE neighbour-the of at ground floor
'He visited the neighbour living on the ground floor

(2) O vizitam **pe** mama.
CL.ACC.3F.SG visited PE Mother
'I visited Mother.'

According to Farkas & von Heusinger (2003), one DOM trigger in Romanian is referential stability. On such a view, DPs differ with respect to the degree to which the condition which they contribute can restrict the choice of value for the variable which they introduce at a particular point in the discourse. The higher a DP is on the referentiality stability scale (in 3 below), the stronger DOM trigger it will be.

(3) Referentiality Stability Scale (Farkas & von Heusinger 2003)
proper nouns, definite pronouns > definite descriptive DPs > partitives > indefinite descriptive DPs

DOM use is obligatory with definite pronouns and proper names (see 3a) (Tasmowski 1987, Dobrovie-Sorin 1994, Mardale 2007, Tigău 2011, Hill & Mardale 2017, 2021 a.o.), whose interpretation remains unchanged throughout the discourse in virtue of their inherent properties; they are unconditionally referentially stable (Farkas 2002, Farkas & von Heusinger 2003, Ciovârnache & Avram 2013).

(4) *(Îl) vizitam *(pe) Vasile/el.
CL.ACC.3M.SG visited PE Vasile he
'I visited Vasile/him.'

DOM is optional with the DPs lower on the scale in (3), whose referential stability is context dependent. Their marking is conditioned by pragmatic factors. Single *pe* signals saliency, "the speaker's intention of placing the direct object in the spotlight" (Hill & Mardale 2021); the participant is presented as prominent in the event (Avram & Coene 2009). Clitic doubling signals D-linked topicality (Avram & Coene 2009, Hill & Mardale 2021), a property inherited from the clitic.

(5) (Îl) vizitam (pe) vecin/ un vecin.
CL.ACC.3M.SG visited PE neighbour a neighbour
'I visited the/a neighbour.'

DOM is generally ruled out with bare plurals (which do not have determined reference) (see 6a) or with incorporated indefinite DPs (as in 6b) (Mardale 2008, Tigău 2011):

(6) a. Am cunoscut (*pe) studenți.
have met PE students
'I met students.'
b. Caută (*pe) zugrav.
looks PE painter
'He is loooking for a painter.'

Animacy cuts across obligatory and optional contexts. Generally, only animate objects allow DOM:

(7) *(O) vizitam *(pe) Maria/(*pe) Londra.
CL.ACC.3F.SG visited PE Maria PE London
'I visited Maria/London.'
(8) (L-) am desenat pe copil/(*pe) pom.
CL.ACC.3M.SG have drawn PE child PE tree
'I drew the child/the tree.'

Animacy can, however, be overidden. There are syntactic contexts where the animacy restriction is either lifted or weakened. The animacy constraint, for example, does not apply to definite pronouns, which must be marked irrespective of whether their antecedent is animate or inanimate. Demonstratives used pronominally require obligatory marking with both animates and inanimates (as shown in 9). However, in the spoken language, with the colloquial forms *asta* 'this one' and *aia* 'that one', marking is optional if the antecedent is [−animate] (see the examples in 10):

(9) *(L-) am desenat *(pe) acela de acolo. [+/−animate]
CL.ACC.3M.SG have drawn PE that of there
'I have drawn the one over there.'
(10) a. *(O) cunoști *(pe) asta? [+ animate]
CL.ACC.3F.SG know PE this
Intended: 'Do you know this one?'
b. Ai citit (-o) doar (pe) asta? [− animate]
have read CL.ACC.3F.SG only PE this
'Have you read only this one?'

DOM is not sensitive to animacy in direct object relatives, where the relative pronoun must be marked in standard Romanian irrespective of animacy (as shown in 11). Other situations in which animacy can be overridden include clitic left dislocation (as in 12, where the modified DP is inanimate) and partitive structures (13):

(11) Articolul *(pe) care l- am citit.
article-the PE which CL.ACC.3M.SG have read
'The article which I have read.'

(12) Pe câteva le- am citit.
PE some CL.ACC.3F.PL have read
'Some of them I have read.'

(13) Am citit- o numai pe una dintre cărţile recomandate.
have read CL.ACC.3F.SG only PE one of books-the recommended
'I have read only one of the recommended books.'

In nominal (ellipsis) structures with the genitival *al* (14) and the adjectival *cel* (illustrated in 15) DOM is obligatory, irrespective of animacy. DOM with the quantifier *tot* 'all' (see 16) as well is indifferent to animacy (Irimia 2020):

(14) Nu *(l-) am citit *(pe) al lui Vasile.
not CL.ACC.3M.SG have read PE AL of Vasile
'I have read Vasile's.'

(15) Nu *(l-) am adus *(pe) cel albastru.
not CL.ACC.3M.SG have brought PE that blue
'I haven't brought the blue one.'

(16) Le- a adunat pe toate. [+/− animate]
CL.ACC.3F.PL have gathered PE all.F.PL
'She gathered them all.'

Irimia (2020), following Pană Dindelegan (1997), includes equative comparative structures in the list of configurations which require obligatory DOM.

(17) L- am luat ca *(pe) un dar.
CL.ACC.3M.SG have taken like PE a gift
'I took it as a gift.'

Additionally, any inanimate descriptive DP can be marked in casual spoken Romanian, with an upgrading effect. Marking may indicate affective speaker stance (Mardale 2008), as in (18):

(18) Uitaţi cum o facem pe mămăliguţă.
look how CL.ACC.3F.SG make PE polenta-DIM
'Look how we are making this little polenta.'

(from Mardale 2008)

Such overextensions are rare. A brief examination of DOM use in CORV, a 220 minute corpus of spoken Romanian (Dascălu-Jinga 2002) identified 42 marked objects. But no DOM with an upgrading effect or with an affective use was found. Examples like the one in (19), however, are attested, though rarely, in child-directed speech (Avram & Coene 2009, Avram & Tomescu 2020).

(19) L- am spălat pe balon.
CL.ACC.3M.SG have washed PE balloon
'I washed the balloon.'

(from Avram & Coene 2009)

All the data discussed so far show that in Romanian the animacy constraint on DOM can or must be overridden. Interestingly, when DOM applies to inanimate objects, the marker is clitic doubling.

The Romanian DOM system is undergoing a change. For some speakers, DOM is exclusively clitic doubling (Klimkowski 2017, Avram & Zafiu 2017); these innovative speakers no longer use single *pe* (see also Bossong 1998). This undergoing change may further contribute to the weakening of the animacy constraint. The fact that clitic doubling signals D-linked topicality (Avram & Coene 2009, Hill & Mardale 2021) explains why it is less sensitive to animacy. Expansion of DOM to inanimate objects was documented for varieties of Spanish, such as Argentinian and Mexican Spanish (von Heusinger & Kaiser 2005, Montrul 2013; see also the discussion in Bautista-Maldonado & Montrul 2019). One of the factors identified as a possible facilitator of this expansion is clitic doubling. By analogy, it is plausible to assume that the current increase in the use of clitic doubling as a DOM marker in Romanian could facilitate a similar expansion to inanimate objects. Ciovârnache & Avram (2013) report that 4 participants in a control group of 15 Romanian-speaking adults in their study unexpectedly accepted the sentence in (20), with a DOM-ed inanimate proper name:

(20) L- au vizitat doar o dată pe Berlin.
CL.ACC.3M.SG have visited only a time PE Berlin
'They visited Berlin only once.'

In terms of language acquisition, there is an important amount of variation in the input which the child receives with respect to the role of the animacy feature. This predicts an early stage when children may "struggle" with animacy within the DOM system.

3. On DOM in L1 acquisition

3.1 DOM in L1 Romanian: previous studies

In spite of the complexity of the Romanian DOM system and of the non-robust input with respect to the role of animacy, DOM was argued to be acquired very early, by age 3. Ticio & Avram (2015) analysed DOM use in 3 longitudinal corpora of child Romanian (age range 1;09 – 3;01). Their data show that DOM emerges very early (1;09 – 2;02) and by age 3 it is used target-like. DOM omission in obligatory contexts (illustrated in 21) is rare and no longer found at age 3;00:

(21) *(pe) Panda bat. (Antonio 1;11)
PE Panda beat
Intended: 'I am beating Panda.'

The three children correctly "ignore" animacy when the direct object is a definite pronoun but marked inanimate descriptive DPs, as in (22) below, are very rare.

(22) O întrec pe minge.
CL.ACC.3F.SG outrun PE ball
'I am outrunning the ball.'
(Antonio 2;11, in Ticio & Avram 2015: 393)

The comparison with early DOM use in 3 longitudinal corpora of child Spanish (age range 1;01 – 2;05) further supports the conclusion that the role of animacy is acquired early. The rate of marked inanimate objects in the Romanian corpora is much higher than the one in the Spanish corpora (where only one child "incorrectly" extended DOM to inanimate objects), in line with the difference between the two systems (see Irimia 2020).

Similar results are reported in Avram & Tomescu (2020). The goal of their study is to investigate the acquisition of DOM by simultaneous bilingual children but the analysis of the control groups of monolinguals reveals early DOM acquisition on the basis of longitudinal data (age 1;09 – 3;01). No incorrect DOM omission or overgeneralization is found in *frog story* narratives (3-year-olds, 4-year-olds and 9-year-olds) either. But optional DOM, which is constrained by discourse-pragmatics (see also Chiriacescu & von Heusinger 2009, 2010), is underused by the younger children when compared to the 9-year-olds and to adults, i.e. the discourse use of DOM is delayed in L1.

Avram et al. (2023) also provide data from *frog story* narratives. The 5-year-old monolinguals in their study (where they serve as a group of control for child heritage speakers of Romanian) used DOM target-like. In particular, in optional contexts, they never extended DOM to inanimate descriptive DPs.

The few available studies provide evidence that DOM is acquired early in child Romanian. In spite of the weak role of the animacy feature, the DOM system is constrained by animacy very early. Several remarks are in order, though. Firstly, all these production studies rely on either naturalistic data or *frog story* narratives. Secondly, in all the studies DOM is attested only with animate definite DPs. Indefinite objects are practically absent and expansion to inanimate objects is extremely rare. In *frog story* narratives, personal pronouns and proper names are very rare and hence the data have nothing to say about DOM in obligatory contexts.

Summing up, in the available production studies DOM is not attested in all possible contexts and hence information with respect to knowledge of DOM in L1 Romanian is incomplete.

3.2 On selective vulnerability of DOM in L1 acquisition

The Romanian data are not singular. DOM has been shown to be acquired early in a variety of languages, irrespective of the nature of the marker and irrespective of the features which constrain object marking. The longitudinal studies in Avram (2015), in line with the pioneering study of Rodríguez-Mondoñedo (2008), provide evidence that DOM is acquired early in Croatian, Estonian, Hebrew, Lithuanian, Romanian, and Spanish. The only exception is the study on child Turkish. Ketrez (2015) draws attention to a production-comprehension asymmetry in the acquisition of DOM (Accusative case marking) in L1 Turkish. Previous studies, which investigated DOM on the basis of naturalistic data, showed that DOM emerges early and that Turkish-speaking children make very few errors (Ketrez 1999, Ketrez & Aksu-Koç 2009). But target-like use was attested in a narrow range of contexts (Ketrez 2015). During the early stages, Turkish-speaking children case-mark only definite direct objects. Marked indefinite objects are not attested. Cases of object marking which involve "ability to attribute complex morpho-semantic/pragmatic functions to case marking, such as the specificity or the wide scope reading with respect to other constituents" (Ketrez 2015: 423) are absent. This absence in the production data leaves unanswered the question of whether children master DOM in these contexts as well. Ketrez (2015) uses a truth-value judgment task (Crain & Thornton 1999) to investigate the comprehension of marked indefinite objects, in different syntactic positions, in a context in which they have wide scope reading over negation in contrast to non-marked objects in the same context. The results reveal that even 6-year-olds have problems comprehending case-marked objects and unmarked ones.

Experimental results which challenge the neat DOM picture in longitudinal studies are also available for L1 Spanish. Guijarro-Fuentes et al. (2017) report experimental data coming from an acceptability judgment task which show that DOM is problematic in L1 Spanish even at the age of 10-15 years. This contrasts with the findings in Rodríguez-Mondoñedo (2008) or in Ticio & Avram (2015), according to which Spanish-speaking children use DOM "virtually without mistake" (Rodríguez-Mondoñedo 2008:21) before they turn 3. An important finding of the study by Guijarro-Fuentes et al. (2017) is that DOM is not equally difficult across the board. Integrating animacy within the system is not problematic but integrating aspect or the semantic features of the subject is and it remains so until late.

Different production and comprehension results are also found in studies which investigated DOM in L1 Hebrew. Uziel-Karl (2015) provides production data which convincingly show that DOM is acquired early. The study relies on data coming from three longitudinal corpora of monolingual Hebrew (age 1;05 – 3;00) which reveal very early emergence (before age 3) and a very low number of errors (6%). Plaut & Hacohen (2022), on the other hand, provide data from a gradable acceptability task which offer a totally different picture. Hebrew-speaking monolinguals, aged 3;06 – 7;10, cannot systematically distinguish between marked definite, unmarked definite and marked indefinite objects.

For the few languages for which both production and comprehension data are available, the former indicate early acquisition whereas the latter show that DOM is (selectively) vulnerable. For Romanian, as mentioned in the previous sub-section, only production data are available and the general picture is that DOM is not problematic. Given the discrepancy between production and comprehension data reported for other languages, as well as the differences between naturalistic and experimental data, investigating the comprehension of DOM in L1 Romanian on the basis of experimental data might contribute to a more comprehensive picture of the acquisition of this interface phenomenon.

4. DOM in L1 Romanian: the view from comprehension

4.1 Aim

The goal of the present study is to investigate the comprehension of DOM in L1 Romanian. As mentioned before, Guijarro-Fuentes et al. (2017) showed that in Spanish, a language whose DOM system is similar to the Romanian one in several respects, vulnerability can be selective: animacy is not problematic, whereas the agentivity of the subject and the aspectual properties of the predicate are. But in Romanian, animacy is a weak feature within the DOM system; it can be overridden in several contexts, which translates into variable input for the language acquirer. This identifies the animacy feature of the object as a possible vulnerability area. In this study we focus on the acquisition of this feature within the DOM system of Romanian. The bonus is that the results could also contribute to our understanding of how children cope with a possible incipient change in the language. As mentioned in Section 2.1, clitic doubling, which is less sensitive to animacy, is gaining ground in contemporary Romanian, being the only differential object marker for some speakers. This innovative system, more restrictive in terms of available markers, is less restrictive with respect to animacy. Under conditions of language change, children may opt for the innovative option, advancing language change (Cournane 2019). If this is indeed the case, the prediction is that children acquiring Romanian could extend DOM to inanimate objects at a rate higher than the one in the input which they receive.

4.2 Methodology

4.2.1 Participants

80 native speakers of Romanian, aged 4;04–11;04, were recruited from kindergartens and schools in Bucharest and Cluj-Napoca. They all come from monolingual families. They are typically developing children, with no history of language or cognitive impairment. The details are summarized in Table 1.

Table 1. Participants

Group	Age range	Mean	No
5-year-olds	4;04 – 5;11	5;01	20[1]
7-year-olds	6;03 – 7;08	7;00	20
9-year-olds	9;00 – 9;07	9;02	20
11-year-olds	10;08 – 11;04	11;00	20

A control group of 10 adults (aged 21-73 years) also took part in the study.

4.2.2 Design and material

We designed a preference judgment task (PJT) which included 16 test sentences across 2 conditions balanced for animacy: (i) DOM with proper names, i.e. obligatory DOM, and (ii) DOM with (definite) descriptive DPs, i.e. optional DOM. In spite of the fact that optional DOM can apply to both definite and indefinite descriptive DPs, in the task only definite DPs were used. This decision took into account the very low number of marked indefinite objects in both child-directed speech and in adult-to-adult speech. Avram & Tomescu (2020) examined DOM use in child-directed speech in two longitudinal corpora (a total of 23 hours of spontaneous conversation). No marked indefinite object was attested. Romanian-speaking children practically never use DOM with indefinites (Ticio & Avram 2015, Avram & Tomescu 2020).

Given the increase in the use of clitic doubling as a DOM marker in the contemporary language, the test sentences contained clitic doubling (see the examples in Table 2). The test sentences were controlled for length. They are given in the Appendix at the end of the paper.

Table 2. Test sentences

DP type	animacy	test sentences: examples	number
Proper name	+animate	(a) Doamna o piaptănă pe Ana. woman-the CL.3.F.SG.ACC combs PE Ana (b) *Doamna piaptănă Ana. woman-the combs Ana 'The woman is combing Ana.'	8
	−animate	(a) Eu am desenat Franța. I have drawn France (b)*Eu am desenat-o pe Franța. I have drawn CL.3.F.SG.ACC PE France 'I drew France.'	

[1] Three children in this young group had to be excluded from the analysis. They constantly said that the same alien (the green or the blue one) said it better.

DP type	animacy	test sentences: examples	number
Descriptive DP	+animate	Domnul îl felicită pe pompier. man-the CL.3.M.SG.ACC congratulates PE firefighter (b) Domnul felicită pompierul. man-the congratulates firefighter-the 'The man is congratulating the firefighter.'	8
	−animate	(a) Pisoiul lovește balonul. cat-the hits balloon-the (b)*Pisoiul îl lovește pe balon. cat-the CL.3.M.SG.ACC hits PE balloon 'The cat hits the balloon.'	

The task also included 2 warm up sentences, 4 control sentences with DOM with personal pronouns (indifferent to animacy) and 4 control sentences with reflexive clitics. Given the number and the diversity of the control sentences, no distractors were included.

The children received a booklet whose main characters were two aliens: a blue one and a green one. On each page there was a picture and the two aliens said something related to that picture: one of them used a sentence in which the object was marked, the other one a sentence with an unmarked object (see Figure 1). The experimenter told the children that the two aliens had recently studied Romanian and read what each of them said. The child was asked to decide "which alien said it better" and to circle that alien. "Both" answers were allowed. The two aliens randomly said a sentence with/without DOM but the same alien never said it "better" for more than 3 times in a row. The two aliens could appear on the right or on the left part of the page, but never on the same part for more than 3 times in a row.

Experimenter: This is the picture of Paris.
Paris is a city in France.

Experimenter: The green alien said:
Turiștii vizitează Parisul. (no DOM)
'Tourists visit Paris.'

Experimenter: The blue alien said:
Turiștii îl vizitează pe Paris. (+ DOM)
'Tourists visit Paris.'

Experimenter: Which alien said it better?

Figure 1. Preference judgment task. Sample.

4.2.3 Coding

The responses were coded as "better with DOM", "better without DOM" and "both". "Both" answers were counted as "better with DOM" (i.e. the child accepted DOM in that particular context) but they were also counted separately. These three response types were correct or incorrect depending on sentence type (see the examples in Table 2). With animate proper names, only "better with DOM" was correct. With inanimate proper names and inanimate descriptive DPs only "better without DOM" was correct. With animate descriptive DPs, all three response types were acceptable. Accepting "both" answers had different implications for the different test sentences. Giving a "both" answer when evaluating a test sentence with an animate proper name indicates incomplete acquisition of obligatory DOM, developmental optionality. In this case, the child accepts both the correct sentence with a marked proper name and the incorrect unmarked one. A "both" answer for a sentence with an inanimate proper name or an inanimate descriptive DP signals uncertainty with respect to the role of the animacy feature, since the child incorrectly accepts DOM with an inanimate object. With optional DOM, i.e. with an animate descriptive DP, such an answer is more difficult to evaluate. It can signal developmental optionality but it can also indicate knowledge that DOM is optional, i.e. the child is aware that both a marked and an unmarked object are acceptable.

Given these differences among the various test sentences, we will present the results for each sentence type separately.

4.3 Results

The control group of adults gave 100% correct responses. They never opted for a marked inanimate object and gave exclusively "both" answers for the sentences with animate descriptive DPs.

Figure 2 presents the descriptive results for the children's preference judgments of sentences with an animate proper name (PN), i.e. the sentences which tested knowledge of DOM in obligatory contexts. They indicate a high preference rating for marked objects across age groups (ranging from 87.5% to 100%). Input divergent acceptance of unmarked animate proper names (as in 23) was attested only with the 5-year-olds and even with this group the rate was very low (see Figure 2).

(23) *Prințesa a acoperit David.
princess-the has covered David
'The princess covered David.'

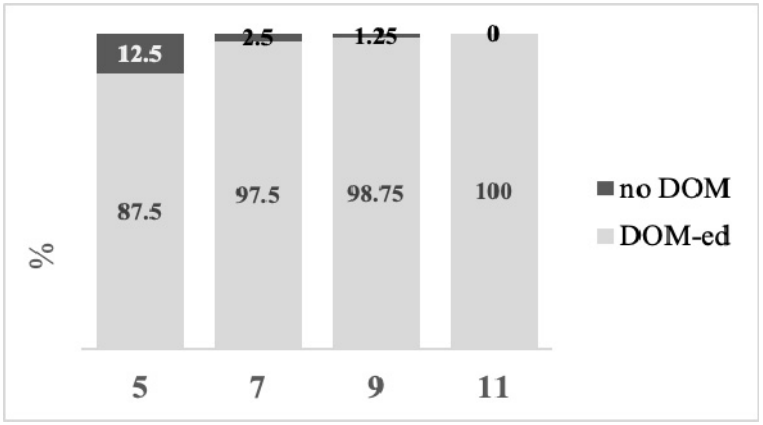

Figure 2. DOM with animate proper names: responses (%) per age group

Children's judgments of this sentence type was categorical. Only two 5-year-olds and three 7-year-olds gave one "both" response, i.e. they accepted both marked and unmarked animate proper names.

The results for the test sentences with inanimate proper names are unexpected given the data reported in previous production studies. The descriptive results summarized in Figure 3 reveal a high preference rate for marked inanimate proper names (as in 24) with the 5- and the 7-year-olds. Such sentences continue to be accepted by the 9-year-olds, but at a low rate. The responses are target-like only with the 11-year-olds.

(24) *Eu am colorat- o pe România.
I have coloured CL.ACC.3F.SG PE Romania
'I coloured Romania.'

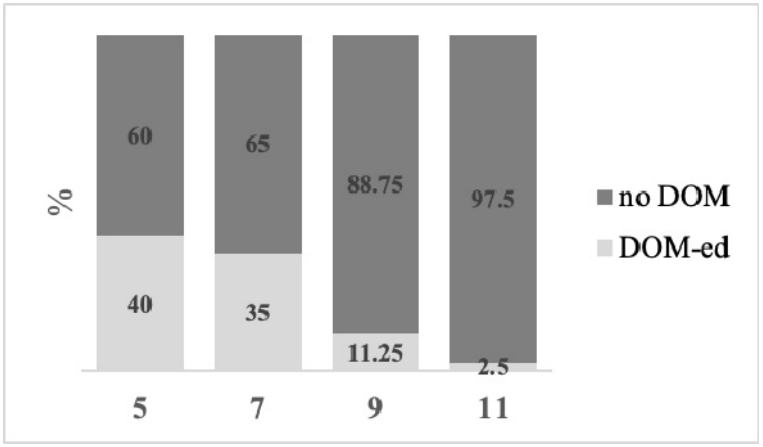

Figure 3. DOM with inanimate PNs: responses (%) per age group

Only 11 "both" responses were found across age groups (i.e. 11 responses out of a total of 320 responses) and no child gave such a response more than once.

The preference judgments of the test sentences with animate descriptive DPs (with which DOM is optional) show more variation with the 5- and the 7-year-old groups, and the preference rating is getting higher with age (as can be seen in Figure 4).

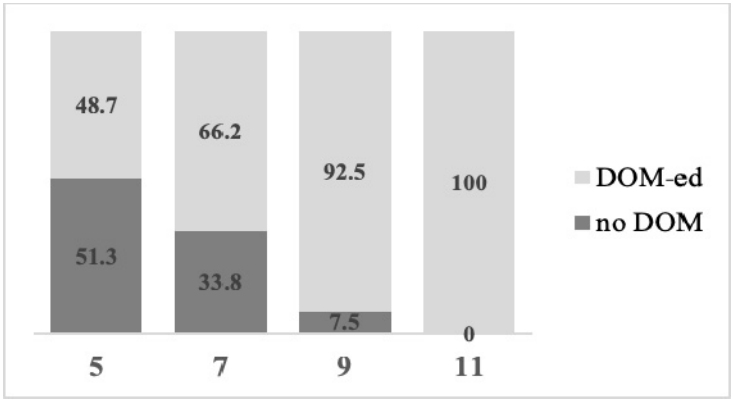

Figure 4. DOM with animate descriptive DPs: responses (%) per age group

Table 3 summarizes the number of "both" responses and the number of the children who gave such responses. It indicates a high number of "both" responses and that this number got higher with age. The number of the children who gave "both" answers also increased with age. The 11-year-olds gave practically only "both" responses, accepting both marked and unmarked objects as equally "good", i.e. the 11-year-olds evaluated these sentences adult-like.

Table 3. DOM with animate descriptive DPs. "Both" responses

Age group	Total nr of "both" responses	Nr of children who gave only "both" responses
5-year-olds	24/80	5/20
7-year-olds	27/80	2/20
9-year-olds	69/80	16/20
11-year-olds	78/80	18/20

With the exception of the 5-year-olds, the participants correctly evaluated as "better" the unmarked inanimate descriptive DPs. Input-divergent sentences like the one in (25) were only rarely chosen as "better", as can be seen in Figure 5. The number of "both" responses was very low, which indicates that children's evaluation of this sentence type is categorical. Only 6 "both" responses were attested across the four age groups. No child gave more than one "both" response.

(25) *Copilul a tăiat-o pe hîrtie.
child-the has cut CL.ACC.3F.SG PE paper
'The child cut the piece of paper.'

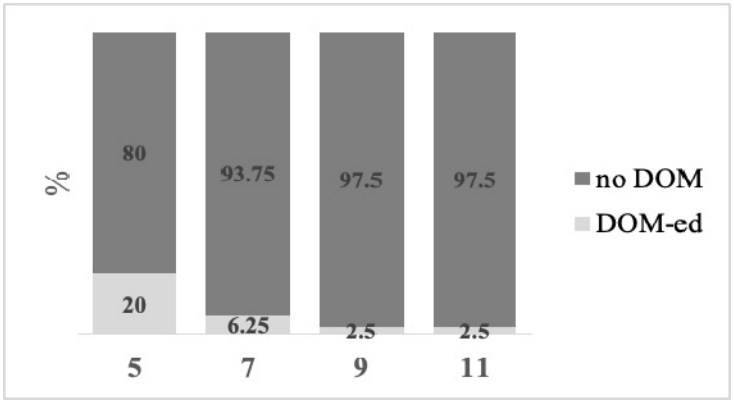

Figure 5. DOM with inanimate descriptive DPs: responses (%) per age group

We followed-up on the higher rates of incorrect responses to sentences with inanimate proper names of the 5- and the 7-year-olds and to sentences with inanimate descriptive DPs of the 5-year-olds. In order to determine if the difference between the acceptance rate of DOM with animate and inanimate objects is significant we conducted pairwise comparisons for each test sentence type. DOM with animate proper names received higher preference ratings than DOM with inanimate proper names. The difference was significant with both the 5-year-olds ($t(19) = 2.63$, $p = .016$ (two-tailed)) and the 7-year-olds ($t(19) = 8.83$, $p < .001$)). Similar results were obtained for DOM with descriptive DPs. The preference ratings were higher with the animate objects than with the inanimate ones in both age groups: 5-year-olds: $t(19) = -3.35$, $p = .003$ (two-tailed) and 7-year-olds: $t(19) = 6.09$, $p < .001$(two-tailed).

Sentences with inanimate proper names received higher acceptability ratings than those with inanimate descriptive DPs, i.e. the younger children preferred DOM with inanimate objects more often with proper names than with descriptive DPs (5-year-olds: $t(19) = 2.63$, $p = .016$ (two-tailed); 7-year-olds: $t(19) = 6.09$, $p < .001$ (two-tailed)) (see Figures 6 and 7 below).

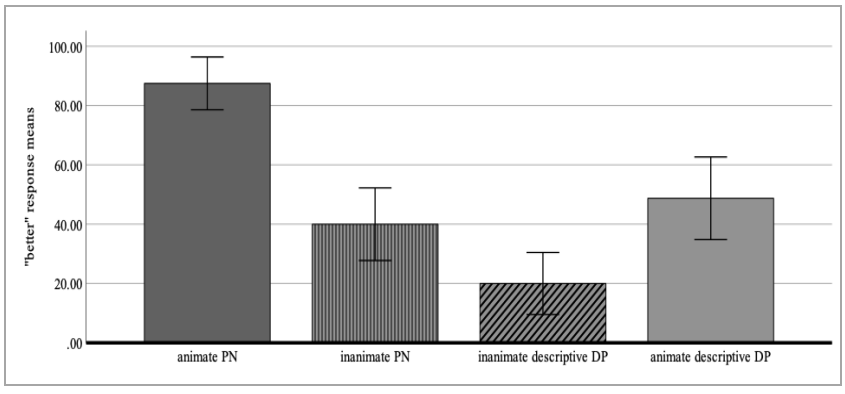

Figure 6. 5-year-olds: Mean scores (with standard error bars) for "better with DOM" responses per sentence type

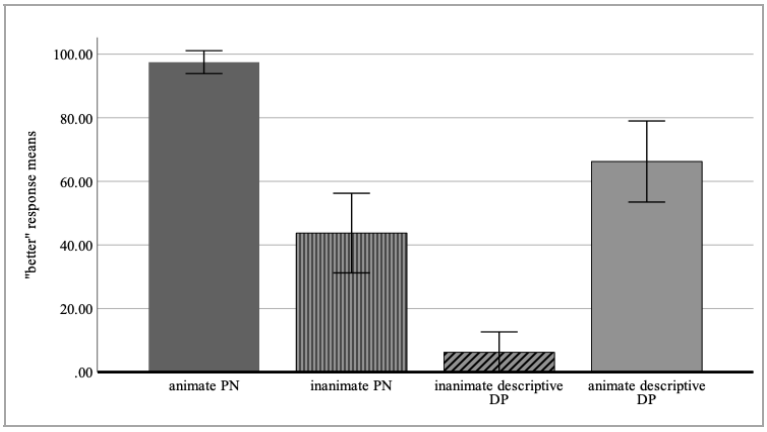

Figure 7. 7-year-olds: Mean scores (with standard error bars) for "better with DOM" responses per sentence type

We followed on the score of the younger two age groups in the proper names condition. One-sample t-tests were run to determine whether the preference score for DOM with inanimate proper names was different than chance (defined as 50%) with the 5- (M = 40%, SD = 19.02) and the 7-year-olds (M = 43.75%, SD = 7.69). The results showed that the mean score was significantly lower than chance in both groups: 5-year-olds: $t(19) = 6.5$, $p < .001$ (two-sided) and 7-year-olds: $t(19) = 6.98$, $p < .001$ (two-sided). They indicate that animacy is already identified as a relevant feature in the DOM system at age 5 but at age 7 it is not fully acquired yet.

The descriptive results for the older groups are summarized in Figures 8 and 9. They indicate target-like responses across sentence types. In particular, the rate of "better with DOM" responses for inanimate objects is very low with both groups.

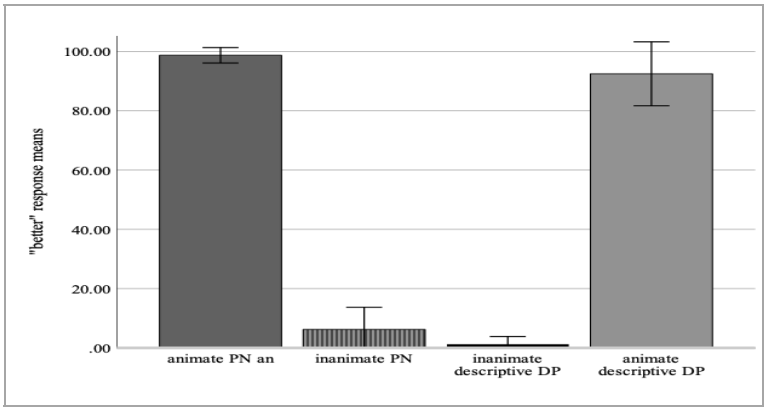

Figure 8. 9-year-olds: Mean scores (with standard error bars) for "better with DOM" responses per sentence type

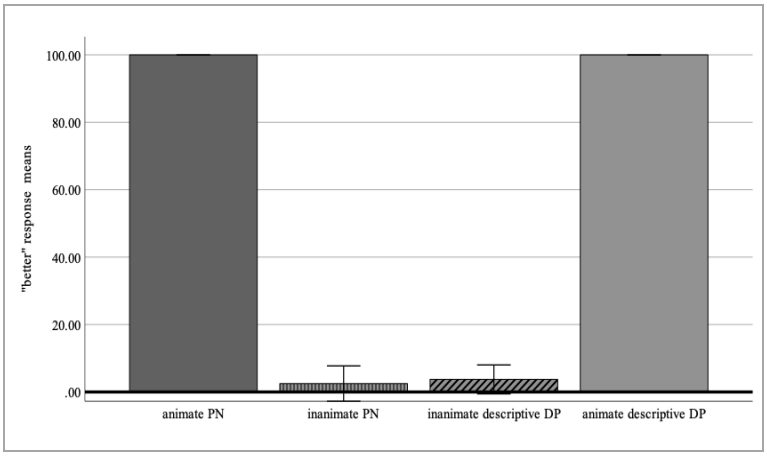

Figure 9. 11-year-olds: Mean scores (with standard error bars) for "better with DOM" responses per sentence type

In order to determine if there are age effects on the preference judgments for the various sentence types, ANOVAs were conducted for each sentence type, followed by post-hoc *t*-tests. The results revealed a main effect of age on all sentence types: (i) DOM with animate proper names: $F(3,76) = 5.78$, $p = .001$; (ii) DOM with inanimate proper names: $F(3,76) = 21.28$, $p < .001$; (iii) DOM with animate descriptive DPs: $F(3,76) = 20.76$, $p < .001$; (iv) DOM with inanimate descriptive DPs: $F(3,76) = 6.98$, $p < .001$). The following pairwise comparisons reached significance: (i) sentences with animate proper names: the 9-year-olds gave a significantly higher rate of "better with DOM" responses ($M = 98.75\%$, $SD = 5.59$) than the 5-year-olds ($M = 87.5\%$, $SD = 19.02$): $t(38) = -2.53$, $p = .015$ (two-tailed); (ii) sentences with animate descriptive DPs: the 9-year-olds gave a significantly higher rate of "better with DOM" responses ($M = 92.5\%$, $SD = 23.08$) than the 5-year-olds ($M = 48.75\%$, $SD = 29.77$): $t(38) = -5.19$, $p < .001$ (two-tailed); (iii) sentences with inanimate proper names: the 9-year-olds gave a significantly lower rate of "better with DOM" responses ($M = 6.25\%$, $SD = 15.96$) than the 7-year-olds ($M = 43.75\%$, $SD = 26.75$): $t(38) = 5.38$, $p < .001$ (two-tailed); (iv) sentences with inanimate descriptive DPs: the 9-year-olds gave a significantly lower rate of "better with DOM" responses ($M = 1.25\%$, $SD = 15.97$) than the 5-year-olds ($M = 48.75\%$, $SD = 29.77$): $t(38) = 3.64$, $p < .001$ (two-tailed). The data indicate significant progress for all test sentences at age 9. The descriptive results are given in Figure 10.

To sum it up, the results revealed that at age 5, Romanian children are sensitive to the referential stability of the DP. They treat obligatory and optional DOM contexts accordingly, i.e. there is a high rate of "better with DOM" responses for those sentences with a proper name in object position. Knowledge that descriptive DPs can be both marked and unmarked fully develops at around age 9, when children explicitly accept both at significant rates. The animacy feature constrains DOM early, as shown by the higher rates of "better with DOM" responses with animate objects across age groups. It is not, however, fully integrated in the DOM system as early as shown in production studies. Romanian children continue to accept DOM with inanimate objects at

unexpected rates until age 7 or 9. DOM with inanimate proper names, though, turned out to be more difficult. At age 5 and 7, children gave more "better with DOM" responses for inanimate proper names than for inanimate descriptive DPs. The descriptive results show that DOM with inanimate proper names begins to be consistently evaluated as unacceptable at age 9, when the "better with DOM" responses reach a low 6.25%. The same rate is reached with DOM with inanimate descriptive DPs at age 7. DOM with inanimate proper names seems to be more vulnerable.

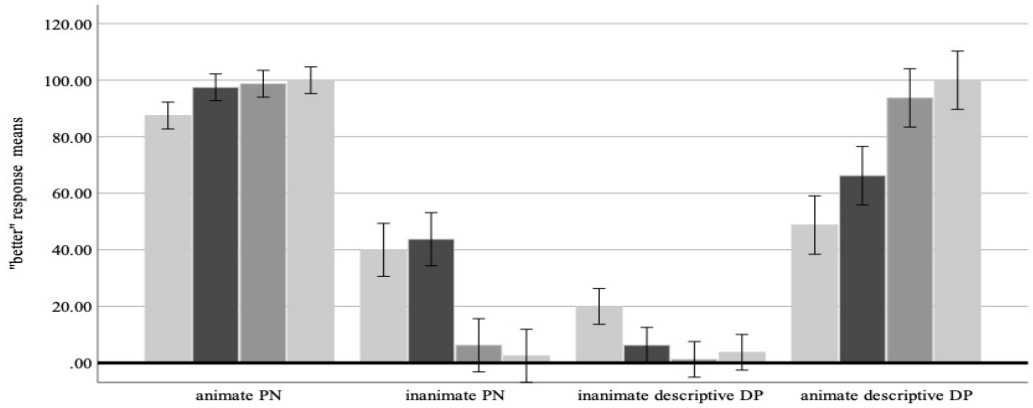

Figure 10. Mean scores (with standard error bars) for "better with DOM" responses per sentence type and age group (in chronological order from left to right in each group of columns).

4.4 Discussion

In this study we investigated knowledge of DOM in L1 Romanian. The aim was two-fold. Firstly, we extended the investigation to comprehension with a view to testing to what extent the Romanian data confirm the production-comprehension asymmetry reported for DOM in L1 Turkish (Ketrez 2015), L1 Spanish (Guijarro-Fuentes et al. 2017) and L1 Hebrew (Plaut & Hacohen 2022). Secondly, we probed into the acquisition of the role of the animacy feature, predicted to be a vulnerable area. In particular, we aimed to determine if Romanian children expand DOM to inanimate objects at a rate higher than the one in the input. In order to address these issues, we conducted a preference judgment task, in which we manipulated type of DP with respect to referential stability and animacy.

Our results show that DOM is mastered later than reported in previous production studies, adding to the increasing evidence that DOM is subject to late acquisition. They also indicate that vulnerability of DOM is selective: referential stability is acquired before animacy. As early as age 5, children treat DOM with proper names and descriptive DPs differently. The former receive higher preference ratings than unmarked proper names. The responses are more categorical with DOM in obligatory contexts; children preferentially opt for sentences with marked animate proper names. With descriptive DPs, they correctly identify the acceptability of both marked and unmarked forms. At the same

time, at age 5 we found a low rate of incorrect acceptance of unmarked animate proper names, contrary to the errorless picture of earlier production studies.

The most important finding was the high acceptability rating of DOM with inanimate objects. This is surprising when compared to the results of production studies but it is in line with the prediction which we made on the basis of the properties of DOM in the contemporary language. The animacy feature has always been the weaker one in the Romanian DOM system (see e.g. Avram & Zafiu 2017). The current expansion of clitic doubling, a D-linked DOM marker which is less sensitive to animacy, can further weaken its role. When there are two competing variants in the input, children have been argued to be able to identify the innovative variant and use it "beyond the level of their caretakers and role models" (Cournane 2019), thereby possibly advancing language change. All these factors predict overuse of DOM with inanimate objects, at least during the early acquisition stages. Indeed, this prediction was borne out by our findings. Though at age 5 animacy is identified as a relevant feature, a fact reflected in the significant difference between the evaluation of sentences with animate and with inanimate objects, the acquisition of the DOM system is delayed. Overgeneralization of DOM to inanimate descriptive DPs decreases to a rate below 10% at age 7 and to inanimate proper names at age 9. This input divergent DOM use gets fully retracted at age 11.

Our results can be accounted for in terms of Biberauer & Roberts' (2015, 2017) Maximize Minimal Means model, which integrates Chomsky's (2005) "third factors" with linguistic experience and genetic factors. According to this language acquisition model children have a tendency "to maximally utilise minimal resources" (Biberauer 2019). Two main biases are identified: Feature Economy and Input Generalization. The former captures the early tendency to postulate as few (contrastive) features as possible to account for the input. The latter captures the tendency to maximise already postulated features in accounting for the input. New features are added only when the acquired features cannot be adjusted to capture relevant contrasts.

In line with the Feature Economy bias, Romanian children possibly first identify and acquire the role of referential stability (which has more robust cues) and consider the possibility of animacy as a relevant feature later. Our experimental data show that at age 5 the role of referential stability has been acquired. Animacy, on the other hand, is present in the system, it has been identified as a relevant feature but it is not yet fully acquired. In line with Input Generalization, children maximize the role of one feature, referential stability, and "go beyond the finite input". This bias favours, in Biberauer's (2019) terms, an "ignorance-based child-driven overgeneralization" of DOM to inanimate objects, which is stronger with proper names. At age 9 the identification and acquisition of animacy as a relevant feature in the DOM system finally leads to retraction of the ignorance driven innovative use.

5. Conclusions

The present study provides, as far as we know, the first comprehension data on the L1 acquisition of DOM in Romanian. Our results confirm the previously noticed

difference between production and comprehension in the acquisition of DOM in L1 Turkish (Ketrez 2015), L1 Spanish (Guijarro-Fuentes et al. 2017), and L1 Hebrew (Plaut & Hacohen 2022). They reveal that the Romanian DOM system is mastered much later than previously assumed on the basis of production data.

Our comprehension data also confirm the selective vulnerability of the relevant features for object marking reported for L1 Spanish (Guijarro-Fuentes et al. 2017). But the data in the present study differ from those for L1 Spanish, where animacy was the least problematic feature. In Romanian, as predicted on the basis of the properties of the DOM system in conjunction with the undergoing change in object marking, animacy turned out to be more vulnerable than referential stability. Under conditions of diachronic instability, Romanian-acquiring children amplify the use of DOM with inanimate objects and they continue to do so until age 9. This overgeneralization is gradually retracted. At age 11, the grammar of the DOM system is no longer input divergent with respect to animacy.

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Appendix. Test sentences per condition

A. DOM with proper names

[+animate]

1. (a) Prințesa l- a acoperit pe David cu pătura.
   princess-the CL.ACC.3M.SG has covered PE David with blanket-the
   (b) Prințesa a acoperit David cu pătura.
   princess-the has covered David with blanket-the
   'The princess covered David with the blanket.'
2. (a) Elefantul îl stropește pe George.
   elephant-the CL.ACC.3M.SG splashes PE George
   (b) Elefantul stropește George.
   elephant-the splashes George
   'The elephant is splashing George with water.'
3. (a) Doamna o piaptănă pe Ana.
   woman-the CL.ACC.3F.SG combs PE Ana
   (b) Doamna piaptănă Ana.
   woman-the combs Ana
   'The woman is combing Ana.'
4. (a) Mama a dus- o pe Ioana la baie.
   Mother has taken CL.ACC.3F.SG PE Ioana at bathroom
   (b) Mama a dus Ioana la baie.
   Mother has taken Ioana at bathroom
   'Mother has taken Ioana to the bathroom.'

[−animate]

1. (a) Eu am desenat-o pe Franța.
   I have drawn CL.ACC.3F.SG PE France
   (b) Eu am desenat Franța.
   I have drawn France
   'I drew France.'
2. (a) Turiștii îl vizitează pe Paris.
   tourists-the CL.ACC.3M.SG visit PE Paris
   (b) Turiștii vizitează Parisul.
   tourists-the visit Paris-the
   'Tourists visit Paris.'
3. (a) Eu am colorat- o pe România.
   I have coloured CL.ACC.3F.SG PE Romania
   (b) Eu am colorat România.
   I have coloured Romania
   'I coloured Romania.'
4. (a) Eu îl cunosc pe București.
   I CL.ACC.3M.SG know PE Bucharest
   (b) Eu cunosc Bucureștiul.
   I know Bucharest-the
   'I know Bucharest.'

B. DOM with descriptive DPs

[+animate]

1. (a) Domnul îl felicită pe pompier.
   man-the CL.ACC.3M.SG congratulates PE firefighter
   (b) Domnul felicită pompierul.
   man-the congratulates firefighter-the
   'The man is congratulating the firefighter.'
2. (a) Cîinele l- a speriat pe iepuraș.
   dog-the CL.ACC.3M.SG has frightened PE rabbit-DIM-the
   (b) Cîinele a speriat iepurașul.
   dog-the has frightened rabbit-DIM-the
   'The dog frightened the little rabbit.'
3. (a) Soldatul o admiră pe prințesă.
   soldier-the CL.ACC.3F.SG admires PE princess
   (b) Soldatul admiră prințesa.
   soldier-the admires princess-the
   'The soldier admires the princess.'
4. (a) Mama a servit- o pe fetiță cu ceai.
   Mother has served CL.ACC.3F.SG PE girl-DIM with tea
   (b) Mama a servit fetița cu ceai.
   Mother has served girl-DIM-the with tea
   'Mother gave the girl some tea.'

[−animate]

1. (a) Băiatul a spart- o pe fereastră.
   boy-the has broken CL.ACC.3F.SG PE window
   (b) Băiatul a spart fereastra.
   boy-the has broken window-the
   'The boy broke the window.'
2. (a) Pisoiul îl lovește pe balon.
   cat-the CL.ACC.3M.SG hits PE balloon
   (b) Pisoiul lovește balonul.
   cat-the hits balloon-the
   'The cat is hitting the balloon.'
3. (a) Pisoiul îl bea pe suc.
   cat-the CL.ACC.3M.SG drinks PE juice
   (b) Pisoiul bea sucul.
   cat-the drinks juice-the
   'The cat is drinking the juice.'
4. (a) Copilul a tăiat-o pe hîrtie cu foarfeca.
   child-the has cut CL.ACC.3F.SG PE paper with scissors-the
   (b) Copilul a tăiat hîrtia cu foarfeca.
   child-the has cut paper-the with scissors-the
   'The child cut the sheet of paper with the scissors.'

EXPLICITATION AND THE TRANSLATION OF ENGLISH ADJECTIVAL COMPOUNDS INTO ROMANIAN

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Abstract: While English and other Germanic languages make extensive use of compounding as a means of expanding their lexicons, in Romanian and Romance languages, in general, compounding is merely a minor word formation process. For this reason, the translation of English compounds into Romanian is a challenging endeavour that usually involves the spelling out of syntactic and semantic information otherwise implicit in the original derivatives. Building on these ideas, the present paper explores the translation strategies employed to render deverbal *-ed* adjectival compounds into Romanian. It is shown that the typological differences between the two languages lead translators to adopt strategies which, to a large extent, entail obligatory explicitation (see Klaudy & Károly 2005, Klaudy 2003, 2009, 2017, Molés-Cases 2019, etc.), though cases of implicitation are not excluded.

Keywords: deverbal *-ed* adjectival compounds, translation strategies, grammatical transposition, compensation techniques, explicitation

1. Introduction

English and Romanian, and Germanic and Romance languages, in general, are typologically different with respect to the word formation processes they regularly employ to expand their lexicons. While English displays a marked preference for compounding (and conversion), Romanian is partial to affixation. Not only is compounding a minor derivational process in Romanian, but the compounds it derives follow patterns unlike those in English, patterns that frequently incorporate inflectional morphology as well. This typological distinction makes translating compounds from English into Romanian problematic for two readily apparent reasons: (i) most lexicalized compounds in English do not have equivalent compound forms in Romanian; (ii) English compounding regularly generates new, spontaneous creations, which, naturally, lack corresponding items in Romanian, and whose high semantic and syntactic variability complicates their rendition.

In view of these observations, the present study investigates the translation into Romanian of a specific subclass of synthetic compounds characterized by a high degree of syntactic and semantic variability – that of deverbal *-ed* adjectival compounds. The aim of the analysis is twofold: (i) to identify the strategies translators adopt to render them into Romanian, as well as the range of patterns said strategies generate; (ii) to relate the identified patterns to the general concept of explicitation as a translation universal, as proposed by Blum-Kulka (1986), Klaudy & Károly (2005), Klaudy (2003, 2009), among others. To this purpose, the analysis will rely on a corpus of hyphenated compounds selected from three fantasy books by Joe Abercrombie, each rendered by a different translator: *The Heroes* (2011), translated by Monica Şerban (*Eroii*, Editura Nemira, 2019), *Best Served Cold* (2009), translated by Ruxandra Toma (*Dulce răzbunare*, Editura

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Nemira, 2017), and *Last Argument of Kings* (2008), translated by Mihnea Columbeanu (*Puterea armelor*, Editura Nemira, 2017). Abercrombie's books are especially suited to this study since the fast pace of the narratives is supported by a wide range of semantically rich, though syntactically compact structures, among which a substantial number of deverbal *-ed* adjectival compounds (409 tokens), distributed into four semantically and syntactically distinct patterns: N-V-ed items (188 tokens), Adv-V-ed items (162 tokens), Q-V-ed items (45 tokens), and A-V-ed items (14 tokens).

The analysis will reveal two opposing tendencies in the translation of deverbal *-ed* adjectival compounds. On the one hand, such derivatives will often be shortened in translation, possibly due to a strong preference for single adjectives as equivalents of lexicalized English compounds in bilingual dictionaries. On the other hand, the high degree of variability of new, spontaneous compounds will force translators to lengthen their renditions into Romanian in order to make explicit the semantic and syntactic relations between the two stems of the original derivatives. Of the two opposing tendencies, the latter will dominate the picture, mainly due to the fact that novel creations, which are typically translated by means of phrases and clauses, represent an open class of items. What is more, the findings of the present analysis, which are similar to those of studies of compound translation into other Romance languages, will further confirm that explicitation, as defined by Blum-Kulka (1986), Klaudy & Károly (2005), Klaudy (2003, 2009, 2017), Molés-Cases (2019) and others, is, indeed, a universal strategy, since most of the translation techniques identified in this study involve explicitation (grammatical transposition, compensation by splitting, compensation in kind, compensation in place, free translation).

The article is structured as follows. Section 2 defines deverbal *-ed* adjectival compounds, identifies several syntactic and semantic patterns, and makes a number of predictions based on these patterns. Section 3 provides an analysis of the corpus from the perspective of the translation strategies outlined by Hervey & Higgins (1992). Section 4 discusses the results of the analysis and relates them to the concept of explicitation. Section 5 summarizes the findings.

2. Background and predictions

-Ed adjectival compounds are a subclass of synthetic compounds whose second stem is deverbal and whose first stem, be it a noun, an adjective, an adverb or a quantifier, is interpretable either as an internal argument (complement) or as a semantic argument (adjunct) of the verb (see Lieber 1983, Plag 2003, Baciu 2004). As already stated, several patterns can be distinguished, depending on the lexical category of the first stem.

N-V-ed compounds, of which there are 188 tokens in the present corpus, represent a highly productive group, which includes many spontaneous formations. The nominal stem of this kind of compound, which corresponds to a prepositional phrase in syntax, typically operates as semantic argument of the verbal stem and is attributed diverse interpretations: Agentive (*man-made* (*thing*) < '(thing) made by man', *flea-bitten* (*nags*) < '(nags) bitten by fleas'), Cause (*rain-spoiled* (*gear*) < '(gear) spoiled by rain',

travel-stained (*coat*) < '(coat) stained by travel', *wind-torn* (*tent*) < '(tent) torn by the wind'), Locative (*pan-fried* (*rump steak*) < '(rump steak) fried in a pan', *battle-hardened* (*Carl*) < '(Carl) hardened in battle'), Locatum (*mud-smeared* (*animals*) < '(animals) smeared with mud', *blood-sprayed* (*boy*) < '(boy) sprayed with blood', *mud-spattered* (*clothes*) < '(clothes) spattered with mud'), Instrument (*straw-filled* (*mattress*) < '(mattress) filled with straw', *leather-bound* (*ledger*) < '(ledger) bound with leather', *gold-embroidered* (*white coat*) < '(white coat) embroidered with gold'). Infrequently, the nominal stem may function as argument of the verb (direct object/subject (?) in *jaw-clenched* (*effort*) < 'effort that clenches one's jaws/makes one's jaws clench', prepositional object in *clothes-obsessed* (*old women*) < '(old women) obsessed about clothes' and *self-satisfied* (*man*) < '(man) satisfied with oneself').

The Adv-V-ed pattern is another highly productive group that is well-represented in the corpus (162 tokens). In such cases, the adverbial stem operates as semantic argument of the verbal stem, denoting mostly Manner (*well-polished* (*heels*), *ill-defined* (*order*), *richly-dressed* (*corpses*), *brightly-coloured* (*Union uniforms*), *perfectly-shaped* (*thumbnail*)) and, infrequently, Time (*long-forgotten* (*designer*), *long-founded* (*institution*), *short-lived* (*relief*)). At the same time, the first stem may be a *bona fide* adverb (*brightly-coloured* (*Union uniforms*), *richly-dressed* (*corpses*), *well-structured* (*violence*)), or an adjective functioning as adverb in the context (*long-established* (*master*), *rough-forged* (*swords*), *tight-packed* (*slaughter*), *hard-packed* (*earth*), *deep-set* (*eyes*)). Quite importantly, many compounds built on *well*, *ill*, *long* (*well-known*, *well-deserved*, *ill-equipped*, *ill-advised*, *long-lived* and others) are lexicalized forms that have lexicalized (mainly single-adjective) equivalents in Romanian.

The Q-V-ed combination, illustrated by 45 tokens, is a subset of the Adv-V-ed pattern, in which the quantifier operates as semantic argument of the verbal stem and denotes Manner (*half-written* (*letter*), *half-remembered* (*ghosts*), *half-shrouded* (*festoons of decorative stonework*), *half-glimpsed* (*face*)).

Finally, the A-V-ed pattern, of which only 14 tokens are present in the corpus, is characterized by low productivity, most likely because these compounds are somewhat less freely built. Specifically, they are based on the passivized forms of resultative constructions, with the adjectival first stem functioning as Result Phrase. Most of the A-V-ed compounds (*green-dyed* (*cloak*), *black-forged* (*double coat of chain mail*), *hard-boiled* (*egg*), *blue-painted* (*forearm*), *red-soaked* (*bandages*), *clean-shaven* (*young officer*), etc.) are adjectival passives of weak/false resultatives (see Washio 1997, Kaufmann & Wunderlich 1998, Farkas 2011), i.e. secondary predicate structures built on telic change-of-state verbs accompanied by Result Phrases specifying the final state lexicalized by the verbs themselves. Infrequently, the compounds may derive from strong/true resultatives, which consist of atelic activity verbs and adjectival Result Phrases whose meanings are independent of the meanings of the verbs they associate with (*clean-picked* (*bones*), *bright-polished* (*weapons*)).

Given the complex picture introduced above, there are a number of predictions that can be made regarding the translation of this class of compounds into Romanian. Generally speaking, since compounding is restricted in Romanian, but highly productive in English, where it generates complex words whose stems are found in various semantic and syntactic relations, the translation of English compounds into Romanian is predicted

to be considerably problematic. On the one hand, lexicalized compounds are not expected to be an issue as they will be listed in bilingual dictionaries with their Romanian equivalents, be they corresponding lexicalized forms (typically single adjectives) or paraphrases. On the other hand, new spontaneous creations are expected to prove difficult to translate because of the variety of patterns, which translators will have to decode, i.e. make explicit by adding lexical material. As a result, the translators' solutions are expected to reveal two opposing tendencies, the shortening or the lengthening of the derivatives in the source language, with the latter taking centre stage since the new spontaneous formations represent an open class of items.

The next section, which focuses on the strategies adopted by the translators to render deverbal *-ed* adjectival compounds and the patterns they generate, will shed light on which of the suggested tendencies actually dominates the picture.

3. Translation strategies

As stated in the introduction, the analysis of the corpus is conducted within the framework provided by Hervey and Higgins (1992). Accordingly, the main strategy selected by the translators to compensate for the lack of corresponding compound forms in Romanian is grammatical transposition. This strategy entails the replacement of a given grammatical structure in the source language with another in the target language. However, in this case, there is no single corresponding structure, but rather a wide array of patterns, ranging from phrases (complex APs, PPs and NPs) to gerundial structures to clauses, be they independent or subordinate clauses of various types. What is more, as will be evidenced in what follows, the translators use grammatical transposition concurrently with a number of other compensatory techniques, and this accounts for the many different translation patterns.

Generally speaking, the strategy of compensation in place, which entails replicating a certain effect in the source text in a different place in the target text, is almost always at work since obligatory premodification in English is typically replaced with postmodification in Romanian. At times, compensation in place may have local effects as well, resulting in the reshuffling of the elements that translate the modifier and the modified in the source language, as illustrated below:

(1) a. … hauled him into the air with a **jaw-clenched effort**.
b. … îl ridică în aer, cu **fălcile strînse de efort**... (lit. ‘jaws clenched with effort’)

(2) a. He ground Jezal's face into the **vomit-spattered floor** with his boot.
b. Şi, apăsând cu cizma, frecă faţa lui Jezal în **voma de pe pardoseală**. (lit. ‘the vomit on the floor’)

(3) a. Cosca was bent over on his knees, shaking with **ill-suppressed mirth**.
b. Cosca se ţinea de burtă şi **hohotea de râs, incapabil să se stăpânească**. (lit. ‘roared with laughter, unable to restrain himself’)

In both (1) and (2), the first stems of the compounds (*jaw* and *vomit*) are translated as the modified elements (*fălcile 'jaws'* and *voma* (*vomit*)), i.e. they become heads of the complex NPs, while the modified nominals in the original structures (*effort* and *floor*) are rendered as complements of the prepositions heading the modifying PPs (*de* (*efort*) (*with* (*effort*)) and *de pe* (*pardoseală*) (lit. 'from on floor' > *on the floor*)). The translation of the compound modifier - modified nominal combination *ill-suppressed mirth* in (3) is even more complex, since it results in the association of clausal structures. The head nominal *mirth* is rendered by a verb-adjunct combination (*hohotea de râs*, lit. 'roared with laughter'), while the compound itself is translated by means of an adjective modified by a subordinate clause (*incapabil să se stăpânească* 'unable to restrain himself'). It should also be pointed out that *compensation in place* results in the lengthening of the original structures, to a greater or lesser degree, as Romanian requires at least the use of prepositions, if not of other more complex relational elements, to clarify the semantic and syntactic relations obtaining between the two stems of the compound, as well as between the compound and the nominal it modifies.

Alternatively, the translators use the strategy of compensation in kind, which entails the compensation for one type of textual effect in the source text by means of another type in the target text; specifically, it involves the replacement of literal meanings in the source text with connotative meanings in the target text and vice versa, as illustrated below:

(4) a. The Carls there were hunched behind their **arrow-prickled shield wall**...
b. Mercenarii de acolo se ascundeau după **scuturile lor înţepate de sute de ori**... (lit. 'their shields prickled hundreds of times')

(5) a. ... holding **one ring-encrusted hand** out towards it.
b. ... i-l arătă cu **un deget care abia dacă se vedea prin atâtea inele**. (lit. 'a finger which one could hardly see under the many rings')

(6) a. Being in charge can seem like **a thing iron-forged**, but in the end it's just an idea everyone agrees to.
b. Să conduci pare **o chestie bine stabilită**, dar în definitiv, nu e decât o idee cu care toată lumea trebuie să fie de acord. (lit. 'a thing well-acknowledged')

Examples (4) and (5) illustrate the replacement of denotative meanings with connotative meanings. The translation of *arrow-prickled shield wall* in (4) adds extra information about the high number of arrows prickling it, giving rise in the reader's mind to a particular image that is not entailed by the original structure. Similarly, the translation of *one ring-encrusted hand* in (5) adds a hyperbolic comment on the number of rings covering the finger by stating that one could hardly see it because of them. In contrast, the connotative dimension of *a thing iron-forged* gets lost in translation, being replaced with the denotative *o chestie bine stabilită* (lit. 'a thing well-acknowledged'), though notice that this is one of the few occasions the translator actually uses a Romanian compound (*bine stabilit* 'well-established', 'well-acknowledged').

Aside from grammatical transposition, the most widespread compensatory strategy is compensation by splitting. It involves the use of several words in the target text to render the meaning of a specific word in the source text. In the present corpus, this

translates into a shift from a compound to either a phrase or a clause, thus lengthening the original derivatives. In particular, compounds are rendered by a variety of syntactic phrases, as illustrated below:

(7) a. the **sun-drenched fields**
b. **câmpurile scăldate în lumina soarelui** (lit. 'the fields bathed in the light of the sun/in sunlight')
(8) a. the inn's **weed-colonised courtyard**
b. **curtea năpădită de bălării** a hanului (lit. 'the courtyard overgrown with weeds')
(9) a. That and a whole crowd of **heavy-armed**, **heavy-scarred**, heavy-scowled Carls.
b. Ceva mai încolo zeci de mercenari **greu înarmaţi**, **plini de cicatrice** (lit. 'full of scars') şi foarte încruntaţi.
(10) a. He had crept from his **sweat-soaked bed**...
b. Se strecurase din **patul jilav de transpiraţie**... (lit. 'the bed damp with sweat')
(11) a. piles of **leather-bound ledgers**
b. grămezi de **registre în scoarţe de piele** (lit. 'ledgers in covers of leather')
(12) a. "Not unless you call **a full-blown revolt** serious."
b. "Numai dacă nu găseşti serioasă **o răscoală în toată regula**."
(13) a. … through small, high windows, their thick bars casting **cross-hatched shadows** across the shining floor.
b. … prin geamurile foarte mici, situate la înălţime, ale căror gratii groase aruncau **carouri de umbre** pe pardoseala strălucitoare. (lit. 'diamonds of shadows')
(14) a. My long retreat from Puranti, which you thought so **ill-advised**...
b. Îndelungata mea retragere din Puranti, pe care tu ai considerat-o **un gest necugetat**... (lit. 'a gesture reckless')

Whereas the compounds in (7) and (8) are rendered by complex APs built on adjectival participles accompanied by adjunct PPs ([*scăldate*]$_{\text{adjectival participle}}$ [*în lumina soarelui*]$_{\text{PP}}$ (≈ 'bathed in sunlight') and [*năpădită*]$_{\text{adjectival participle}}$ [*de bălării*]$_{\text{PP}}$ (lit. 'overgrown with weeds')), those in (9) and (10) are translated as complex APs built on *bona fide* adjectives modified by PPs with adjunct status ([*plini*]$_{\text{A}}$ [*de cicatrice*]$_{\text{PP}}$ (lit. 'full of scars') and [*jilav*]$_{\text{A}}$ [*de transpiraţie*]$_{\text{PP}}$ (lit. 'damp with sweat')).

Alternatively, the adjectival head of the complex AP can be modified by an AdvP, as is the case in (9) (*heavy-armed* (lit. '[greu]$_{\text{AdvP}}$ [înarmaţi]$_{\text{adjectival participle}}$'). This structure is an instance of literal translation, a strategy typically employed to render the Adv-V-ed pattern since Romanian can also readily generate the [adverbial modifier + adjectival participle] combination. In fact, 41 out of the 45 items illustrating the Q-V-ed pattern, which was analyzed as a subset of the Adv-V-ed pattern since the quantifier, just like the adverb, functions as Manner-denoting semantic argument, follow this particular word order.

In their turn, the compounds in (11) and (12) are rendered by PPs with attributive function (*în scoarţe de piele* for *leather-bound* and *în toată regula* for *full-blown*, which is actually an idiomatic PP). Finally, the compounds in (13) and (14) are translated as complex NPs, i.e. modified nouns. The translation of *cross-hatched shadows* as *carouri de umbre* is not only an example of compensation by splitting, but also of compensation in place, as once again, the first stem of the compound (*cross*) becomes the nominal head (*carouri* 'diamonds') modified by a PP which incorporates the original nominal head as the complement of P (*de umbre* 'of shadows'). On the other hand, *ill-advised* (*retreat*) in (14) is replaced with a full-fledged NP *un gest necugetat* (lit. 'a gesture reckless' > 'a reckless gesture') whose nominal head the translator adds as extra element.

Once again, notice the pervasiveness of prepositional elements in the rendering of most of the above compounds, triggered by the need to spell out the syntactic and semantic relations between the two stems of the compounds and between the compounds and the nouns they modify. Naturally, their added presence will contribute to the lengthening of the original structures, making it the translators' dominant tendency.

In addition, the use of compensation by splitting may produce clausal structures of various kinds and lengths, either independent or subordinate clauses, as illustrated below:

(15) a. They looked up at him, **pain-twisted**, dirt-smeared or bandaged faces...
b. Se uitară direct la el, **schimonosindu-se de durere**, cu feţele bandajate mânjite de noroi... (lit. 'grimacing with pain')

(16) a. … across the **battle-scarred** ground before the walls...
b. … terenul din faţa zidurilor, **care purta rănile luptei de mai devreme**... (lit. 'the grounds before the walls, which bore the wounds/scars of the earlier battle')

(17) a. But I feel **duty-bound** to point out that there is such a thing as being *too* determined.
b. Dar cred **că este datoria mea** să precizez că prea multă hotărâre strică uneori. (lit. 'that it is my duty')

(18) a. … it seemed almost **a thing man-made**.
b. … încât părea **că oamenii îl ridicaseră special acolo**. (≈ '[seemed] that people had purposely built it there')

(19) a. "Cardotti's House of Leisure is an old merchant's palace," Vitari was saying, voice chilly calm. "**Wood-built**, like most of Sipani..."
b. "Casa de Huzur a lui Cardotti este fostul palat al unui negustor," spunea Vitari pe un ton calm şi rece. "**E făcută din lemn**, ca mai toate construcţiile din Sipani..." (lit. 'it is made of wood')

As the examples above indicate, the clausal structures translating the compounds may range from non-finite (gerundial) structures (15b) to different types of finite subordinate clauses – relative (attributive) clause (16b), direct object clause (17b), subject clause (18b)) to independent/root clauses (19b). They are mostly paraphrases and, in some cases, like in (18b), even instances of free translation.

In contrast to the strategies investigated so far, which all contribute to the expansion of the original compounds, compensation by merging has the opposite effect. It

is a technique that entails the conversion of a complex phrase in the source text to a single word or a shorter phrase in the target text. In the present corpus, the two-stem compound is reduced to a single adjective, as illustrated below:

(20) a. a touch less **house-broken**
b. mai puţin **dresat** (lit. ‘trained’)
(21) a. Gorst’s **soot-stained** jacket
b. haina **pătată** a lui Gorst (lit. ‘stained’)
(22) a. **blood-daubed** palm
b. palma **însângerată** (lit. ‘bloodied’)
(23) a. Hairy’s bellow turned to a **high-pitched** howl...
b. Răgetul Părosului deveni un urlet **ascuţit**. (lit. ‘shrill’)
(24) a. a **heavy-built** veteran with a scar on his cheek
b. un veteran **voinic**, cu o cicatrice pe obraz (lit. ‘stout’)
(25) a. his **blood-spotted** aspect
b. aspectul lui **înfiorător** (lit. ‘terrible’, ‘horrifying’)
(26) a. The **long-established** master of the middle ground.
b. De o veşnicie este maestrul **incontestabil** al compromisului.
(lit. ‘incontestable’, ‘indisputable’)
(27) a. their **bright-polished** weapons ready
b. cu armele **lucitoare** gata de luptă (lit. ‘shining’)
(28) a. her good **green-dyed** cloak
b. pelerina ei **verde** (lit. ‘green’)

Leaving aside the statistics for the next section, most of the compounds that get translated as single adjectives are of the N-V-ed or the Adv-V-ed patterns, although the reasons why they end up translated as single adjectives only partially overlap.

Thus, N-V-ed compounds are rendered by single adjectives if there is a lexicalized equivalent in Romanian, as is the case in (20) (*dresat* for *house-trained*), or if the adjunct first stem is not deemed relevant enough to translate (see (21), where *soot* is lost in translation), or if there is an item in Romanian whose meaning combines the semantics of the two stems of the original compound (see (22), where *blood-daubed* (*palm*) becomes (*palma*) *însângerată* (lit. ‘bloodied’), an adjectival participle derived from the denominal verb *a însângera* (lit. ‘to bloody’, ‘to cover or stain with blood’). In other cases, compensation by merging occurs simultaneously with compensation in kind, allowing the translator to employ a lexicalized single adjective of their choice. It is the case in (25b) and (26b), where there is a shift from denotative to connotative meaning, as the descriptive compound adjectives *blood-spotted* and *long-established* are replaced with the evaluative adjectives *înfiorător* ‘terrible’, ‘horrifying’ and *incontestabil* ‘incontestable’, ‘indisputable’.

It is interesting to notice that the number of Adv-V-ed compounds rendered by single adjectives is roughly three times higher than that of N-V-ed compounds (there is a 56 to 18 ratio in favour of the Adv-V-ed pattern). A possible explanation is that most Adv-V-ed compounds are already lexicalized forms with recurrent first stems in English (*long* in *long-lived*, *long-established*, *long-held*, etc., *well* in *well-groomed*, *well-muscled*,

well-worn, etc., *ill* in *ill-disciplined*, *ill-equipped*, *ill-advised*, etc. and the list goes on). What is more, they have lexicalized equivalents in Romanian, for instance, *long-lived* is *îndelungat*, *well-groomed* is *fercheș*, *ill-disciplined* is *indisciplinat*. This is also the case for *high-pitched* in (23) (*ascuțit*) and *heavy-built* in (24) (*voinic*).

Finally, more than half of the number of A-V-ed compounds are rendered by single adjectives (8 out of 14 tokens), though this number is less significant given the scarcity of the pattern. However, notice that it is the first stem that is translated as a single adjective (*bright-polished* (*weapons*) becomes (*armele*) *lucitoare* (lit. 'shining') in (27) and *green-dyed* (*cloak*) becomes (*pelerina*) *verde* (≈ 'green cloak') in (28). This is not surprising considering that, as stated in the previous section, A-V-ed compounds are passivized versions of resultative constructions. Therefore, it is only natural that the focus fall on the first stem, since it is the item that functions as Result Phrase denoting the final state achieved by the modified noun.

So far the analysis has covered translation strategies that either expand or reduce the source language structures (grammatical transposition, compensation in place, compensation in kind, compensation by splitting vs. compensation by merging). In contrast, literal translation is defined by Hervey & Higgins (1992: 250) as:

> a word-for-word translation, giving maximally literal rendering to all the words in the ST [source text] as far as the grammatical conventions of the TL [target language] will allow; that is, literal translation is SL [source language]-oriented, and departs from the ST sequence of words only where the TL grammar makes this inevitable.

According to this definition, there are two ways in which literal translation is employed in the present corpus and they are illustrated in (29) to (33) below:

(29) a. a **much-loved** leader
b. **mult-iubitul** lider
(30) a. … your **well-deserved** elevation to the throne.
b. … **binemeritata** urcare pe tron.
(31) a. the **new-mortared** parapets
b. parapetele [**proaspăt**]$_{Adv}$ [**tencuite**]$_{A}$
(32) a. their **fresh-dug** ditch
b. şanţul lor [**recent**]$_{Adv}$ [**săpat**]$_{A}$
(33) a. the blades of their **rough-forged** swords
b. tăişurile săbiilor [**făurite**]$_{A}$ [**rudimentar**]$_{Adv}$ (lit. 'forged roughly')

On the one hand, literal translation is only infrequently used to render English compounds by means of equivalent compounds in Romanian since Romanian compounds are few and far between and, moreover, do not generally follow the same patterns. The present corpus includes only four such items that perfectly mirror the original derivatives, two of them exemplified in (29) and (30) above (see also (6b)). On the other hand, as already pointed out, the Adv-V-ed pattern is frequently rendered by literal translation in so far as Romanian has a parallel syntactic structure with the modifying adverb preceding

the modified adjective, though without the two of them combining into a compound (see (31) and (32) above). As a rule, literal translation is applied concurrently with compensation in place, since the adverb-adjective modifying combination follows the noun. Alternatively, compensation in place may be taken one step further, when the order of the two stems – the adverb and the adjective – is reversed as well, as illustrated in (33).

Overall, the corpus analysis conducted in this section has demonstrated that, due to the general absence of corresponding lexicalized forms in Romanian, the translators are usually forced to forgo literal translation and, instead, frequently employ alternative strategies which, more often than not, expand the original derivatives by spelling out the semantic and syntactic relations between the stems.

4. Statistical analysis

This section provides a statistical analysis of the translation patterns uncovered in the previous section in order to assess the validity of the predictions stated in section 2.

The general prediction was that the strategies adopted by the three translators would reveal two opposing tendencies: the shortening or the lengthening of the source text structures, depending on the type of compound translated (lexicalized item or spontaneous creation). It was speculated that the tendency towards shortening would be related to the translators' possible preference for single adjectives as equivalents of lexicalized English compounds in bilingual dictionaries. In contrast, it was hypothesized that the tendency towards lengthening would be triggered by the variable semantic and syntactic relations between the stems of novel compound formations in English, which, in the absence of equivalent lexicalized forms, had to be made explicit to avoid translation loss. Last but not least, it was predicted that the tendency towards lengthening would dominate the picture due to the fact that new compound creations form an open class.

The statistical data in the tables below indicate that the predictions are borne out. Table 1 provides an inventory of the translation patterns generated by the various strategies discussed in section 3, shedding light on the translators' shortening/lengthening tendencies. Table 2 provides information about the distribution of single item vs. phrase/clause per identified compound pattern.

Table 1. Translation patterns

Compound to phrase / clause	Compound to single item	Compound to compound	Omission	Shift in meaning (error)	Free translation	Total
278 68.65%	86 21.02%	4 0.97%	23 5.62%	12 2.93%	3 0.73%	409

Table 2. Single item and phrase/clause distribution/compound pattern

Pattern	Complex AP	PP	Complex NP	Clausal structures	Single item
N-V-ed (188 items)	128	15	4	7	18
Adv-V-ed (162 items)	70	12	3	3	56
Q-V-ed (45 items)	32	1	0	2	4
A-V-ed (14 items)	2	1	0	1	8
	232/278 83.45%	29/278 10.43%	7/278 2.51%	13/278 4.67%	86

Table 1 confirms that the translators' tendency towards lengthening the original derivatives does dominate the picture, with 278 out of 409 tokens (68.65%) being either phrases of various types (complex APs, complex NPs, PPs) or clauses (both root and subordinate clauses, as indicated in the previous section). It follows the frequent application of grammatical transposition operating simultaneously with different compensatory techniques (compensation by splitting, compensation in place, compensation in kind). These strategies are needed to render the diverse semantic and syntactic relations existing between the two stems of compounds that are novel formations. It is the case of the great majority of items in the N-V-ed group as well as of more than half the items in the Adv-V-ed set.

Notice also that, when compounds are rendered by means of phrases and clauses, more often than not, they are translated as complex APs (232 out of 278 tokens – 83.45%), and less frequently as PPs (29 out of 278 tokens – 10.43%) or clausal structures (13 out of 278 tokens – 4.67%); in other words, there is a sharp contrast between the percentage of complex AP structures and the rest. One possible reason is that in both English and Romanian, past participles can operate as adjectives and can easily associate with semantic arguments by virtue of their basic verbal nature, hence, that would make them the translators' first choice.

Rendering compounds by means of single adjectives, thus shortening the original structures, ranks second, with 86 out of 409 tokens (21.02%), which is less than one third of the percentage of lengthened structures (68.65%). This choice derives from the application of the strategy of compensation by merging. As previously mentioned, it concerns mainly derivatives of the Adv-V-ed pattern (56 out of 86 tokens – 65.11%), to which one might add the four compounds in the Q-V-ed group, since it is a subset of the former. The 60-item group is followed by the set of derivatives belonging to the N-V-ed pattern (18 out of 86 tokens) and that of A-V-ed compounds (8 out of 14 tokens). The reason why the Adv-V-ed set has the highest percentage of single-adjective translations is that, as already shown in the previous section, many of the items in this group are lexicalized forms built on a small number of adverbs and adjectives operating as adverbs in the respective combinations (*ill*, *well*, *long*, *short*, *hard*, *heavy*, etc.) and they have corresponding lexicalized forms in bilingual dictionaries, which are usually single

adjectives, though sometimes they may also be paraphrased (*ill-fated* (*ghinionist*), *ill-tempered* (*irascibil*), *well-known* (*celebru*), *short-lived* (*trecător*, *de scurtă durată* (lit. 'of short duration')), etc.).

Although the number of A-V-ed items is small (14 tokens), eight of them are also translated as single adjectives (57.14%). Most likely, this is because the translated A stem corresponds to the Result Phrase of the resultative construction each compound is based on. As has been shown, the RP is the element that introduces the relevant information, i.e. it denotes the resulting state achieved by the entity affected by the event. What is more, in most cases, when the compounds are passivized versions of false/weak resultatives, the Result Phrase further specifies the resulting state inherent in the meaning of the change-of-state verb, so it is only natural that the translator should choose to focus on the element that details the achieved state.

Last but not least, the presence of only four compounds as the lexicalized equivalents of the English items verifies the claim that English and Romanian are typologically different with respect to the derivational processes they favour for expanding their lexicons (compounding and conversion for the former, and affixation for the latter).

Overall, the findings of this investigation are similar to those of studies of compound translation into other Romance languages (see Labrador de la Cruz & Ramón García 2010 for Spanish, Pierini 2015 for Italian). They also emphasized the typological differences between English and each of the respective languages and pointed out the translators' need to adopt strategies that would expand and explicate the original compounds. The existence of three separate studies of compound translation into Romance languages with similar conclusions lends support to the view that explicitation is, indeed, a universal strategy (see Blum-Kulka 1986, Klaudy & Károly 2005, Klaudy 2003, 2009, 2017, Molés-Cases 2019, etc.) since many of the techniques uncovered by these studies are operations that involve explicitation. They may call them "(syntactic) transposition", "modulation", "functional translation", whereas here they are called "grammatical transposition", "compensation by splitting", "compensation in place", "compensation in kind", but they all have the same effect – explicitation. However, although explicitation is obligatory due to the above-mentioned typological differences between English and Romanian (Romance), implicitation, i.e. the shortening of the source text derivatives, is also (infrequently) a distinct possibility when it involves lexicalized forms.

5. Conclusions

Starting from the typological differences between English and Romanian regarding their preferred means of expanding their lexicons (compounding vs. affixation) and the minor status of compounding in the latter language, the present article has investigated the issue of compound translation into Romanian by focusing on the strategies involved in rendering deverbal *-ed* adjectival compounds.

The analysis has identified two tendencies in the way in which translators render deverbal *-ed* adjectival compounds into Romanian.

On the one hand, because Romanian has different means of deriving compounds and does so infrequently, translators are forced to opt for strategies that lengthen the English compound structures (grammatical transposition, compensation by splitting, compensation in place, compensation in kind) in order to clarify the syntactic and semantic relations existing between the two stems.

On the other hand, under specific circumstances, translators may opt for strategies that have the opposite effect – the shortening of the original structures. This occurs when the English compound is a lexicalized item that has a lexicalized equivalent in Romanian.

Of the two, lengthening the original structure is the dominant tendency given that compounding is an active derivational process in English constantly producing novel, spontaneous forms. These new creations represent an open class of items that are non-existent in Romanian and, thus, always require clarification, hence, they lead to the lengthening of compounds in translation.

The present analysis falls in line with other studies of compound translation into other Romance languages. Their similar findings regarding the translators' tendency towards expanding the source language structures supports the view whereby explicitation is a universal translation strategy.

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Diana Hornoiu. 2021. *Understanding Pragmatics: From Theory to Practice*. Constanţa: Ovidius University Press. 207 pp. + xiii

Reviewed by Costin-Valentin Oancea*

Diana Hornoiu's book *Understanding Pragmatics: From Theory to Practice* is included in the book series 'Studies in Linguistics', published by Ovidius University Press. The book consists of eight chapters, followed by appendices and references.

Chapter 1, "Defining pragmatics" (pp. 1-12), starts by briefly presenting the history of pragmatics (conferences, volumes, journals). The need for pragmatics is also succinctly discussed, as well as the relation between pragmatics and syntax/semantics. The last part of the chapter tackles different approaches to pragmatics (i.e. linguistic-philosophical pragmatics, sociocultural-interactional pragmatics and intercultural pragmatics).

As the title indicates, Chapter 2, "Reference, deixis and anaphora" (pp. 13-28), focuses on the concept of deixis, deictic reference and different types of deixis (person deixis, time deixis, place deixis, discourse deixis, social deixis). The author then swiftly moves to deictic and non-deictic usages. The chapter ends with a discussion of anaphora and cataphora.

Chapter 3, "Presupposition" (pp. 29-47) opens with a brief discussion regarding the phenomenon of presupposition as first raised by Frege in 1892. Different types of presupposition are presented and exemplified.

In Chapter 4, "Context, implicature and cognition" (pp. 48-86), Grice's theory of conversational implicature is presented at length. Grice's famous maxims of conversation that govern rational change and bridge the gap between what is said and what is meant are discussed and commented upon. The author also tackles generalized and particularized conversational implicatures, based on the distinction originally drawn by Grice. The last part of the chapter focuses on Neo-Gricean theories of implicature.

Chapter 5, "Language as action: Speech acts" (pp. 87-103) presents Austin's (1962) theory of speech acts. According to Austin, certain types of sentences are designed to do something, instead of just saying something which can be deemed as either true or false. He labels these sentences "performatives", in contrast to what he calls "constatives". Also included here is a discussion of locutionary, illocutionary and perlocutionary acts, meaning what is said, what is done and the effect. Searle's taxonomy of speech acts is also highlighted as well as indirect speech acts.

"Relevance Theory" constitutes the topic of Chapter 6 (pp. 104-119). According to Sperber & Wilson's (1986a, 1986b) Relevance theory, in a given context, the decoded meaning of the sentence is compatible with a number of different interpretations. They also mention that for a piece of information to be deemed relevant, it has to produce some effect on the addressee's cognitive environment. In Sperber & Wilson's (1986a: 158) own words, the principle of relevance is defined as follows: "every act of ostensive communication communicates the presumption of its own optimal relevance." Also included here is a brief overview of the key principles of Relevance Theory.

Chapter 7, "Politeness Phenomena" (pp. 120-153) is devoted to the concept of politeness, as put forward by Brown & Levinson (1978, 1987). Brown & Levison's proposal has as central tenet the concept of "face", defined as "the public self-image that every member wants to claim form himself" (1987: 61). Face has two sides: "positive face", which is the desire to be approved of and "negative face", seen as the desire to be unimpeded in one's actions. The chapter is strewn

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with relevant examples that illustrate positive face and negative face, which are meticulously analysed and accounted for.

The last chapter, "Conversation Analysis" (pp. 154-187), delves into conversation analysis, an approach to discourse which is derived from ethnomethodology. The author starts by drawing a distinction between "conversation" and "conversational analysis". The former refers to a line of linguistic inquiry which is also known as ethnomethodological conversation analysis, associated with the works of Sacks, Schegloff, and Jefferson and Pomerantz (1978), among others. The latter aims at describing the conversational uses of language and has as proponents authors like Gumperz, Tannen and Schiffrin. The next section is addressed to turn-taking organization and the local management system. This chapter also draws on naturally-occurring Romanian conversations, part of the Constanţa corpus which the author collected throughout the years.

Diana Hornoiu's book, *Understanding Pragmatics: From Theory to Practice* is a useful tool for anyone interested in the fascinating domain of pragmatics. The chapters on Relevance Theory and Politeness Phenomena, usually missing from other introductory textbook to pragmatics, add value to the book. The interesting examples from Romanian, part of the Constanţa corpus, together with the instructions provided in Appendices 1 and 2 regarding transcription procedures represent a big plus. Also worth mentioning is the fact that each chapter is followed by a "Checking understanding" section which contains exercises designed to reinforce the concepts tackled in the aforementioned chapter and a "Further Reading" section for the readers interested in finding out more about a particular topic. All in all, the book under review represents a valuable addition to the exciting domain of pragmatics in general and English and Romanian pragmatics, in particular. For achieving this, the author deserves ample credit and congratulations.

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