THE INFLUENCE OF ANIMACY, GIVENNESS, AND FOCUS ON OBJECT ORDER IN CROATIAN DITRANSITIVES

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Abstract

This study aims to investigate how animacy, givenness, and focus influence object order preference (direct-indirect, indirect-direct) in Croatian ditransitive structures. An online survey testing acceptability judgements of four target word orders in various contexts was conducted on 82 native speakers of Croatian. We found that all three factors have an effect on word order preference. The study revealed a preference for DO-IO orders once animacy was neutralized, and found that focus influences object order more strongly than a simple given/new contrast. The word order with the widest contextual applicability is verb-direct-indirect, thus indicating the potential underlying status of this structure.

1. Introduction

Factors that influence word order in ditransitive sentences have been widely studied cross-linguistically, and it is commonly agreed that definiteness, givenness, weight, pronominality, animacy, and focus influence the choice of dative structure (De Marneffe, 2012). More precisely, these factors follow a *harmonic alignment*,

according to which definiteness, givenness, pronominality, and animacy influence word order by placing the definite/given/pronominal/animate constituent in front of the constituent that does not have these properties; conversely, properties such as weight and focus affect word order by favoring the heavy or focused constituent to follow the constituent without this property. This study aims to determine how the preference of the order of the verb (V), indirect object (IO), and direct object (DO)[1] in Croatian ditransitive sentences varies in contexts with different animacy, givenness, and focus values of the object(s).

This study focuses on the pragmatic, rather than the syntactic, factors that influence word order in ditransitives. As a result, only NPs were considered, and other referring expressions (clitics and pronouns) were excluded. The main reason for doing so is that, in Croatian, clitics obligatorily occur in second position (Schütze, 1994), which is indented both as the second word or the second constituent, in case the first consitutne comprises of more words. Consequently, the placement of clitics is purely syntactic, even though the choice of referring expression is clearly determined by pragmatics. Pronouns, which typically signal given arguments and are light, have been excluded as well. Furthermore, weight is not a factor in this study, since we constructed the NP objects to they have equal length.

[1] The abbreviations IO and DO are used when the objects are referred to in isolation, and with regard to their relative word order (IO-DO/DO-IO); whereas, when we refer to word order including the verb, the following abbreviations will be used: VID, IVD, VDI, and DVI.

We also decided not to test for definiteness in this task, due to the imbalance in the status of definite and indefinite markings: Croatian does not have obligatory definiteness marking, and has more means for marking definiteness (demonstratives, possessives, and possibly some types of adjectives) than indefiniteness, the latter including the quantifier *neki* 'some' or the numeral *jedan* 'one'. These can also be ambiguous between specific and non-specific readings. The task, nevertheless, contains some instances of determiners, in order to keep the task more natural. The definiteness markings are not expected to play a role in word order preference, as they match the *given* and *new* values of the objects.

Therefore, the purpose of this paper is to discuss how animacy, givenness, and focus influence and interact with word order in Croatian ditransitives. Croatian is an understudied language in this regard, as most of the studies on word order have been conducted on other Slavic languages.

An acceptability judgment task (AJT) was set up, with an array of conditions with different values for the three factors that are the focus of this study, and 82 native speakers of Croatian took part in it.

The results show that animacy, givenness and focus have an effect and interact in their influence on word order. There is a clearer effect of givenness when animacy is neutral, which can be seen by comparing conditions where the IO is animate to the conditions in which both objects are animate, or neither object is animate. We also found that, when animacy is neutralized (no-animate and both-animate), the

DO-IO orders (VDI and DVI) are preferred to IO-DO orders (VID and IVD). This signals a discrepancy between our findings and naturalistic data, since corpus data from the Double Object Database (DODB) (Velnić, 2014) (Kovačević, 2004) and the Croatian Adult Spoken Language Corpus (HrAL) (Kuvač Kraljević and Hržica, 2016) show that the IO-DO object order is by far the most frequent one in naturalistic data. This study also found that the word order with the widest contextual applicability is VDI, as it is well accepted in all conditions, and the preferred word order in neutral conditions (no-animate/both-animate and no-given). We interpret this as an indication that VDI is the underlying word order for ditransitives in Croatian.

The paper is structured as follows: the introduction continues with a section on Croatian ditransitives and a section describing the factors and their effects. In the following section, we lay out the research questions and predictions. Then we proceed with a methodology section and the results, followed by discussion. The last section is reserved for the conclusions.

2. Ditransitive structures in Croatian

Since Croatian is defined as a 'free' word order language, all possible word order combinations of subject, verb (V), direct object (DO) and indirect object (IO) in ditransitive sentences are attested, but the variants are not interchangeable, as they depend on pragmatic factors (Siewierska, 1998). Research on the pragmatics of Slavic languages has mostly been conducted on Russian, Czech, and Polish. Mithun (1992)

states that, in these languages, pragmatics has strong effects on word order when compared to languages like English, where syntactic roles primarily determine word order.

Observing the effects of pragmatic factors on word order is more straightforward in ditransitive structures, because the prominence of one of the objects is contextual. This would not be the case in a subject-object relation of transitive sentences where the subject is more prominent than the object, because the subject has potential control over the action expressed by the sentence (Lamers and De Hoop, 2004). Thus, the relative ordering of the two objects should be the result of pragmatic factors, and not of thematic role. Croatian uses case to mark the thematic roles of theme and recipient present in ditransitive structures, and the cases used are accusative and dative respectively. Some examples of word order possibilities of ditransitive sentences are provided in (1).

(1)	a. Ana	daje	Marku	jabuku.	(S**VID**)
	Anne-NOM	gives-3rd.SG	Mark-DAT	apple-ACC	
	b. Ana	daje	jabuku	Marku.	(S**VDI**)
	Anne-NOM	gives-3rd.SG	apple-ACC	Mark-DAT	
	c. Ana	Marku	daje	jabuku.	(S**IVD**)
	Anne-NOM	Mark-DAT	gives-3rd.SG	apple-ACC	
	d. Ana	jabuku	daje	Marku.	(S**DVI**)

Anne-NOM	apple-ACC	gives-3rd.SG	Mark-DAT	
e. Ana	Marku	jabuku	daje.	(SIDV)
Anne-NOM	Mark-DAT	apple-ACC	gives-3rd.SG	
f. Ana	jabuku	Marku	daje.	(SDIV)
Anne-NOM	apple-ACC	Mark-DAT	gives-3rd.SG	

'Anne is giving the apple to Mark.'

In the current study, we focus on the boldfaced orders presented in (1a)-(1d). The position of the subject (S) is not taken into consideration here, since Croatian is a subject-drop language, and, in many of the test items in the task, the subject is omitted. The verb-final orders are possible (IDV and DIV), but are not taken into consideration in order to reduce the complexity of the task. The verb position was found to be an influential factor in this task regarding the judgment between VID and IVD, and thus a more detailed study is in order, in which the three possible positions of the verb (initial, mid, and final) will be investigated in more detail.

We have checked the distribution of three ditransitive verbs ('give', 'bring', and 'show') in the HrAL spoken corpus of Croatian (Kuvač Kraljević and Hržica, 2016), and found IO-DO (n=143) orders to be considerably more frequent than DO-IO orders (n=37). Table 1 shows the distribution of word orders found in HrAL.

Table 1: Distribution of word orders from HrAL

IO-DO			DO-IO		
VID	IVD	IDV	VDI	DVI	DIV[2]
69	63	11	4	3	30
143			37		

A closer look at the data reveals that the high number of IO-DO orders might be due to extensive use of the clitic form of the IO (n=130). When these occurrences are excluded, the number of IO-DO orders (n=38) is reduced with respect to DO-IO orders (n=16). This is why, in the current study, we only include NPs.

Languages that do not have case marking, such as English, employ different strategies for signaling the thematic roles of theme and recipient. Dative Alternation (Oehrle, 1976:7) is one of those strategies, and it consists of two distinct syntactic structures for expressing the arguments in a ditransitive. Thus, the two structures present in English are referred to as the Prepositional Dative (PD) in (2a) and the Double Object Dative (DOD) in (2b).

(2) a. Marlon gave an apple to Stig.

b. Marlon gave Stig an apple.

[2] Unfortunately, DIV was not included in the study, as the HrAL corpus of spoken Croatian became public after the data for the study has been collected. This study was designed based on the proportions of word orders found in child directed speech in the CHILDES corpus, which was the only source of spoken Croatian available at the moment.

Gračanin-Yuksek (2006) draws a parallelism between Croatian word order and the Germanic alternating structures of PD and DOD seen in (2). She claims that IVD (1c) is the semantic equivalent of DOD (2b) and VDI (1b) is equivalent to the PD (2a), while VID (1a) is structurally ambiguous between the two structures; no claims were made on the DVI. In order to keep the methodology as balanced as possible, we have decided to also investigate the preference for DVI in the present study.

Moreover, it has been claimed for Germanic languages that PD is an ambiguous structure that can be used across contexts, while the DOD is more contextually bound (Clifton and Frazier, 2004for English), (Kizach and Balling, 2013For Danish).

However, Gračanin-Yuksek (2006) analyzed this parallelism under neutral intonation. Here, we are analyzing the word order preferences in very specific contexts, so the two studies are not directly comparable. But if VID is structurally ambiguous, we can expect it to be more contextually applicable, and thus well accepted across the array of conditions tested in the survey. We expect the object-first orders to be more contextually bound due to the prominent (fronted) position of one of the objects.

How strong of an effect each of the three factors has on Croatian speakers should be revealed in the contextually bound conditions (when one object displays one of the three properties), and it should manifest as a stronger preference for the orders where the prominent (given/animate/focused) object precedes the object

without that property. By contrast, the word order with the widest contextual applicability will be observed based on the overall judgments and the judgments of the neutral conditions.

3. Factors: animacy, givenness, and focus

Now we move on to describing the effects of the factors involved in this study. We have chosen to investigate one semantic factor: animacy, and two pragmatic factors: givenness and focus. The latter is however only investigated in a sub-section of the task (see section on Methodology). Animacy is considered a semantic factor, because it is dependent on the referent and not the context, and its value does not change depending on the discourse; givenness and focus are considered pragmatic factors, because they are context-dependent, and the speakers need to update the givenness and focus value of the referents as the discourse progresses. We will address the influence of the semantic factor and pragmatic factors in turn.

3.1 The effect of Animacy

The effect of animacy on word order can be referred to as the *animacy-first effect*. This entails that, when animacy is not balanced, animate entities will tend to come first (Van Nice and Dietrich, 2003). A consequence of this is the use of animate nouns as subjects. Animacy and grammatical role also interact, as the stereotypic agent is animate, while the patient is inanimate (Van Nice and Dietrich, 2003:829).

With regard to theme (DO) and recipient (IO) in ditransitives, the prototypical theme is inanimate, while the recipient is animate. This is why we refer to the ditransitive condition with an animate IO and an inanimate DO as *prototypical*, while, when the two objects have the same animacy value, we call it *balanced*.

According to BraniganPickering and Tanaka (2008), animacy influences the conceptual accessibility of referents and makes them easier to retrieve; this influences both word order and grammatical function assignment, in that what is highly accessible is placed in front of what is not. Conceptual accessibility is related to how retrievable an item is from memory (McdonaldBock and Kelly, 1993).

Animacy is a very relevant part of this study because of its close link to the indirect object: indirect objects are usually animate in ditransitives since they have the role of recipient, and, prototypically, only animate entities are able to receive. Thus, we investigated the preferred word orders both when the animacy is *prototypical* (IO-animate, DO-inanimate) and when it is *balanced* (IO and DO animate / IO and DO inanimate).

3.2 The effects of givenness and focus

The two pragmatic factors are discussed together due to their relation to one another in the current task.

With regard to givenness, we want to explore whether the *given before new* (henceforth given>new) principle applies also to Croatian. According to the

given>new principle, speakers typically prefer to place given information earlier in the sentence and new information later in the sentence (Birner and Ward, 2009). This way of arranging elements was already mentioned in connection with the notion of harmonic alignment (De Marneffe, 2012) above.

For Slavic languages, most of the research on the given>new principle has been conducted on Czech (Firbas, 1971, Kučerová, 2007, Kučerová, 2012, ŠimíkWierzba and Kamali, 2014), and Polish (Grzegorek, 1984, Siewierska, 1993). The majority of these studies are conducted on word order in general, or on linearizations closely related to, but not quite the same as, givenness (definite-indefinite, topic-comment); sometimes, the findings for the same language are divergent. For example, Kučerová (2012) concludes that, in Czech, Russian, and Serbo-Croatian[2], given elements precede new ones, and a new>given order is ungrammatical. In contrast to that, ŠimíkWierzba and Kamali (2014) claim that given objects can occur anywhere in the sentence; with some exceptions regarding the final position, which is constrained by additional intonation and stress factors in some languages, like Czech. This approach makes the role of the given>new principle less strict.

Thus, the data provided from the precious studies is not unified and shows various degrees of accommodating the given>new principle. The current study investigates two of those levels: a simple given/new contrast, but also a given/focus contrast.

[2] Term used by the author

Hence, on the other side of the spectrum, this study also analyses focus. Focus differs greatly form givenness with regard to its effect on linearization, as it effects the focused argument to be placed last; thus, a background>focus order emerges. In this paper, we are only concerned with focus as an element contributing to information structure. Contrastive focus is not included in this study. Pereltsvaig (2004) defines focus as the new, non-presupposed, and informative part of the clause; focus is thus the piece of information that is communicatively more relevant than the background (Klabunde, 2004). The definition according to which we have structured the task in this study comes from Gundel (1999:295): focus represents the new information that is being asserted or questioned in relation to the background; it is implicitly or explicitly the answer to the relevant wh-question in a certain context. Thus, even if the given/new distinction does not match the background/focus distinction precisely, for the purposes of this study, we can consider *given* and *focused* information being in complementary distribution.

Røreng (2011) conducted a corpus study in German and found that the variation in object ordering in ditransitives is due to animacy and focus-background structures. She also found that IO-DO is the more common order in the corpus, but nevertheless claims that DO-IO is the basic word order; despite the low frequency, it is revealed in contexts when focus and animacy are neutralized. Røreng's (2011) results found that focus is a more relevant factor than animacy.

Overall, the judgments of given objects should reveal if there is a preference for the given object to precede the new object; in addition, with the conditions in which an object is focused, we will reveal whether Croatian speakers pay attention to explicit focus by having stronger preferences for a certain word order when an object is focused, compared to the conditions in which the object is not in focus but simply not given (i.e new).

4. Research questions and predictions

The present study aims to determine if and how the three factors (animacy, givenness, and focus) influence word order preference, and how they interact in doing so. We have thus designed an acceptability judgment task (AJT) that will be thoroughly described in the following section. Our research questions are the following:

1. Does Croatian follow the orders of information structure previously described for other languages (animate-first, given>new, background>focus)?
2. How do these factors interact?
3. What role does the position of the verb play?
4. Which word order has the widest contextual applicability, and what word order is preferred in neutral conditions?

Based on the literature, we have no reason to assume that the three factors will not be influential in Croatian, or that they will act differently; we thus predict that the three factors influence word order as previously found in other languages. We also predict that these factors will interact, and, from these interactions we will understand how influential a factor is. The AJT contains contexts with and without focus, and, as focus and givenness are in complementary distribution, we expect the conditions with focus to fortify the givenness effect when compared to the conditions where the new object is not in focus; thus, we expect focus to provide a quantitative difference rather than a qualitative one.

Since all the word orders that are included in this study are grammatical and attested, we do not expect any order to be judged as completely unacceptable. Our prediction is that the word order pairs with the same object order (VDI with DVI, VID with IVD) will have similar judgments in each condition.

Verb placement is expected to play a role, as different usages have been reported in Gračanin-Yuksek (2006). In the current study the three word orders that Gračanin-Yuksek (2006) analyzed are included (VID, IVD, and VDI) in addition to VDI for symmetry sake (two IO-DO orders and two DO-IO orders). We expect that one of the verb-first word orders is more likely to be better accepted in neutral context than their object-first counterparts, as we expect these to be designated for conditions in which the fronted object is given.

When it comes to finding the word order with the widest contextual applicability, we make our prediction according to the implications made by Gračanin-Yuksek (2006): VID is structurally ambiguous and VDI is the equivalent to the Germanic PD, which was found to have a wider contextual applicability than the DOD (Clifton and Frazier, 2004, Kizach and Balling, 2013). The ambiguity of the VID and the wider contextual applicability of the PD and consequently its equivalent (VDI) makes us expect these orders to be more readily accepted across the task, especially in neutral conditions.

Some evidence for the status of VID is provided by corpus data from HrAL (Kuvač Kraljević and Hržica, 2016) with VID being the most frequently used word order in full ditransitive sentences, for three different verbs. Conversely, VDI was the least used word order in the section of the corpus we have looked at (4/180 ditransitive occurrences). Thus, the parallelism that VDI is claimed to have with the Germanic PD, might not entail it to also transfer the applicability that the said structure has in other languages. Either way, the task in this study will show how likely the speakers are to prefer the four word orders, depending on the variation of the three factors in play.

4. Methodology

The test consisted in an online acceptability judgment task (AJT) that provided different contexts involving various combinations of the three factors (see Materials

below). These context sentences were followed by the four target word orders that the participants had to judge on a 5-point Likert scale. The four target word orders (VID, IVD, VDI, and DVI) were randomized for each context.

4.1 Materials

The survey was created using SurveyGizmo and was available online. It contained a total of 12 contexts (combinations of the three factors) distributed over 18 test items. The experiment contained a total of 41 sentences, including fillers. The fillers had the same setup as the test items, but entailed rating long and short adjective in various contexts. Tables 2 and 3 show the distribution of test items per contexts.

Table 2: Distribution of test items in contexts without explicit focus[4]

	Balanced animacy		Unbalanced animacy
	Both animate	Both inanimate	IO animate
DO given	1	1	2[5]
IO given	1	1	2
No given	1	1	2
Total	12		

[4] Due to a compiling error, one of the examples in this slot has only 25/82 responses

[5] These sentences contain arguments that are new but, unlike in the examples in Table 2, do not constitute the target of the wh-questions.

Out of the various definitions of focus seen in section 2, we have chosen to set up the focus conditions as an answer to a wh-question, since that is the explicit and most straightforward way of defining focus (Gundel, 1999, Klabunde, 2004). Therefore, the context sentence was a wh-question, and the focused element was the answer (see example 5 below). The test items with focus included also what can be considered a baseline condition for this set, namely when neither object is in focus, and the referent explicitly being asked about was the subject (S focus condition). Table 3 provides an overview of the target examples with focus.

Table 3: Distribution of test items in contexts with focus

Focus	Balanced animacy: Both animate	Unbalanced animacy: IO animate
IO focus	1	1
DO focus	1	1
S focus	1	1
Total	6	

Each of the test items consisted of two parts: the context and the target sentences. The context had the function to set up the pragmatic factors (givenness or focus): it introduced the given object, or set the focus with a wh-question. The target sentences were presented in the four target word orders (VID, IVD, VDI, and DVI), randomized

for each example. Thus, an object was considered [+given] if it had been mentioned in the context sentence, and [-given] when it had not been mentioned in the context sentence; an object had the [+focus] value when it was the answer to a question provided in the context sentence, otherwise it was not considered in focus. Animacy was set as a binary distinction of +/- animate, as all animates had human referents and all inanimate referents were not human.

This is not a fully crossed design, since there were no examples with an animate DO and inanimate IO. The reason for this is that it is a quite an unnatural situation, and the examples would be marked, and it would require the use of infrequent verbs, e.g. 'to sacrifice'. In such a marked context, it would be hard to distinguish whether a word order preference is linked to the properties of the objects or to the verb and the context as a whole. Examples (3) - (6) provide an example for each factor.

(3) Test item: neutral, both animate and no-given

Context sentence:

a. Danas je učiteljica bila jako nervozna.
today is-AUX teacher-NOM was very nervous.

Target (expressed with four different word orders in a random order):

b. VID: Zato je bez razloga poslala ravnatelju učenika.
because is-AUX without reason-GEN sent-1st.SG principal-DAT pupil-ACC

c. VDI: Zato je bez razloga poslala učenika ravnatelju.

d. IVD: Zato je bez razloga ravnatelju poslala učenika.

e. DVI: Zato je bez razloga učenika poslala ravnatelju.

'Today the teacher-F was very nervous. That is why she sent the pupil to the principal.'

(4) Test item: balanced animacy, DO given

Context sentence:

a. Moja teta je jako stara no inače je veoma zdrava.

my-NOM aunt-NOM is very old but usually is very healthy.

Iznenada joj je jutros pozlilo.

suddenly her-DAT.CL is-AUX this_morning sick

b. VID: Zato sam odmah odvezla doktoru tetu.

Therefore am-AUX right away drove doctor-DAT aunt-ACC

c. VDI: Zato sam odmah odvezla tetu doktoru.

d. IVD: Zato sam odmah doktoru odvezla tetu.

e. DVI: Zato sam odmah tetu odvezla doktoru.

'My aunt is very old but is usually very healthy. This morning she suddenly felt sick. Thus, I drove my aunt to the doctor right away.'

(5) Test item: neutral givenness, prototypical animacy

Context sentence:

a. Žena čeka prijateljicu u kafiću.

woman-NOM waiting friend-ACC in café

A: Evo te napokon! Znaš li gdje su druge?

here you-ACC.CL at last know-2nd.SG Q-particle where are-3rd.PL.RFLX others

B: Za Anitu ne znam a

for Anita-ACC NEG know-1st.SG but

b. VID: Marina će kasniti, jer mora odnijeti mentorici tekstove.

Marina-NOM will-AUX be_late-3rd.SG because must-3rd.SG take supervisor-DAT texts.ACC

c. VDI: Marina će kasniti, jer mora odnijeti tekstove mentorici.

d. IVD: Marina će kasniti, jer mora mentorici odnijeti tekstove.

e. DVI: Marina će kasniti, jer mora tekstove odnijeti mentorici.

'A woman is waiting for a frend in a café.

A: Finally, here you are! Do you know where the others are?

B: I don't know about Anita, but Marina will be late because she had to bring her supervisor some texts.'

(6) Test Item: focused DO, prototypical animacy

Context sentence:

a. Što ćeš ponuditi kolegama kad dođu kod tebe?

what will-AUX offer colleagues-DATwhen come-3rd.PL to you-GEN

Target (expressed with four different word orders in a random order):

b. VID: Ponuditi ću kolegama palačinke.

offer-1st.SG will-AUX colleagues-DAT pancakes-ACC

c. VDI: Ponuditi ću plačinke kolegama.

d. IVD: Kolegama ću ponuditi palačinke.

e. DVI: Palačinke ću ponuditi kolegama.

'What will you offer to your colleagues when they come to visit? I will offer pancakes to my colleagues.'

VID, VDI, IVD, and DVI alternatives are provided for the participant to judge.

4.2 Participants

A total of 82 native speakers of Croatian completed the survey; the ages were between 18 and 53 (mean=23.3), and 16 were male. The participants found out about the survey through social media, and we distributed web links along with QR-codes to students of the Economy, Law, and Philosophy faculty at the University of Rijeka. Before starting the survey, the participants had to accept that their answers

will be used for research purposes. Sensitive data was not collected: the participants did not provide their name, so there was no need for anonymisation.

4.3 Procedure

The survey was created with SurveyGizmo. Before starting the survey, the participants had to fill in a questionnaire concerning their age, gender, native language, what other languages they spoke, and where they grew up. The participants then had to proceed with the survey by reading the context sentence and then judge the follow-up sentences based on their contextual acceptability on a 5-point scale, with 1 being unacceptable and 5 perfectly acceptable. The participants saw both the context sentence and the targets at once, but the order in which the four targets were presented was randomized per each test item. All test items were presented to the whole group of participants.

5. Results

First, we wanted to make sure than none of the used word orders had a bias towards it. We did so by looking at the mean for each word order in the survey (table 4). Since this is an acceptability judgment task, and all of the word orders are grammatical, a very low score was not expected for any of the word orders. We also looked into the distribution of the highest judgment score (judgment=5) per each

participant, to check if any of our participants had a preferred word order and thus judged it with a 5 across the task. No such outliers were found.

Table 4: Average judgments in the AJT

All conditions	VDI	DVI	VID	IVD
	3.96	3.70	3.07	3.41

Table 4 shows a high similarity of the judgments values of the four word orders, entailing that there was no bias towards a particular word order, and thus any difference that might be found in the following sections can be considered context-related.

5.1 Comparison of the models

The survey items do not have a fully crossed design, as the six conditions with focus have an additional factor (+Foc) on one of the items (IO or DO), and that would make a single statistical model too complex. We have thus chosen to have two separate analyses: one including only the targets without questions that provide explicit focus (data from Table 2); the other one including only the examples with explicit focus (data from Table 3). With regard to the analysis for the responses from Table 2, we have set up a model (*All mod* in Table 5) using linear mixed effects in R that included the DO-IO preference and three factors (the levels for each factor are

presented in brackets): animacy (IO, No, Both), givenness (IO, No, DO), and verb placement (Verb-first, Object-first). Participant and the order in which the word order appeared in each condition were set as random effects. Following that, we have set up three additional models, each excluding one of these three factors (No Animacy mod, No Givenness mod, and No Verb Placement mod). Then, a likelihood ratio test was conducted: it consisted in using ANOVAs to compare the model with all the factors to a model without one of the factors, in order to establish the significance of its effect on word order acceptability.

We find that all of the three factors are responsible for word order choice in the AJT. Animacy affected the DO-IO over IO-DO preference (p-value=$5.98e^{-10}$); givenness affected the DO-IO over IO-DO preference (p-value=$6.955e^{-05}$); and verb placement also had an effect (p-value=$2.2e^{-16}$), entailing that the participants had different preferences on verbal position in different contexts. The concise results of the statistical analysis are presented in Table 5.

Table 5: Results of ANOVAs of the full model compared to the models without one factor

	Df	AIC	BIC	logLik	deviance	Chisq	Df	p-value	Significance
No Animacy mod	9	7230.8	7280.6	-3606.4	7212.8				
All mod	21	7186.3	7302.3	-3572.1	7144.3	68.549	12	$5.98e^{-10}$	***
No Givenness mod	9	7202.4	7252.1	-3592.2	7184.4				
All mod	21	7186.3	7302.3	-3572.1	7144.3	40.087	12	$6.955e^{-05}$	***
No Verb placement mod	12	7292.9	7359.2	-3634.5	7268.9				
All mod	21	7186.3	7302.3	.3572.1	7144.3	124.64	9	$2.2e^{-16}$	***

The same method was applied to the data with focus: a model was set up including DO-IO preference, animacy, verb position, givenness, and whether the context sentences was formulated with a wh-question or not (focus vs. non-focus). Then, it was compared to a model that did not have focus as a variable. Thus, this model included the full dataset, as the key comparison is between the examples with focus (given-focus distinction) and without focus (given-new distinction). The results show that the presence of explicit focus influences DO-IO over IO-DO preference (p-

value=0.02), but less so than the previous factors. The concise results of this test are presented in Table 6.

Table 6: Results of ANOVAs of the model with focus compared to the model without focus

	Df	AIC	BIC	logLik	deviance	Chisq	Df	p-value	Significance
No-Foc model	11	5959.1	6017.7	-2968.5	5937.1				
Foc model	19	5957.0	6058.3	-2959.5	5919.0	18.046	8	0.02088	*

However, Tables 5 and 6 are not directly comparable, as they are conducted on different data sets, since the latter includes the examples with focus and the former one does not, and there are fewer examples with explicit focus than examples with a simple given-new distinction. The following sections will provide a more graphic insight on the relevance and interaction of the factors.

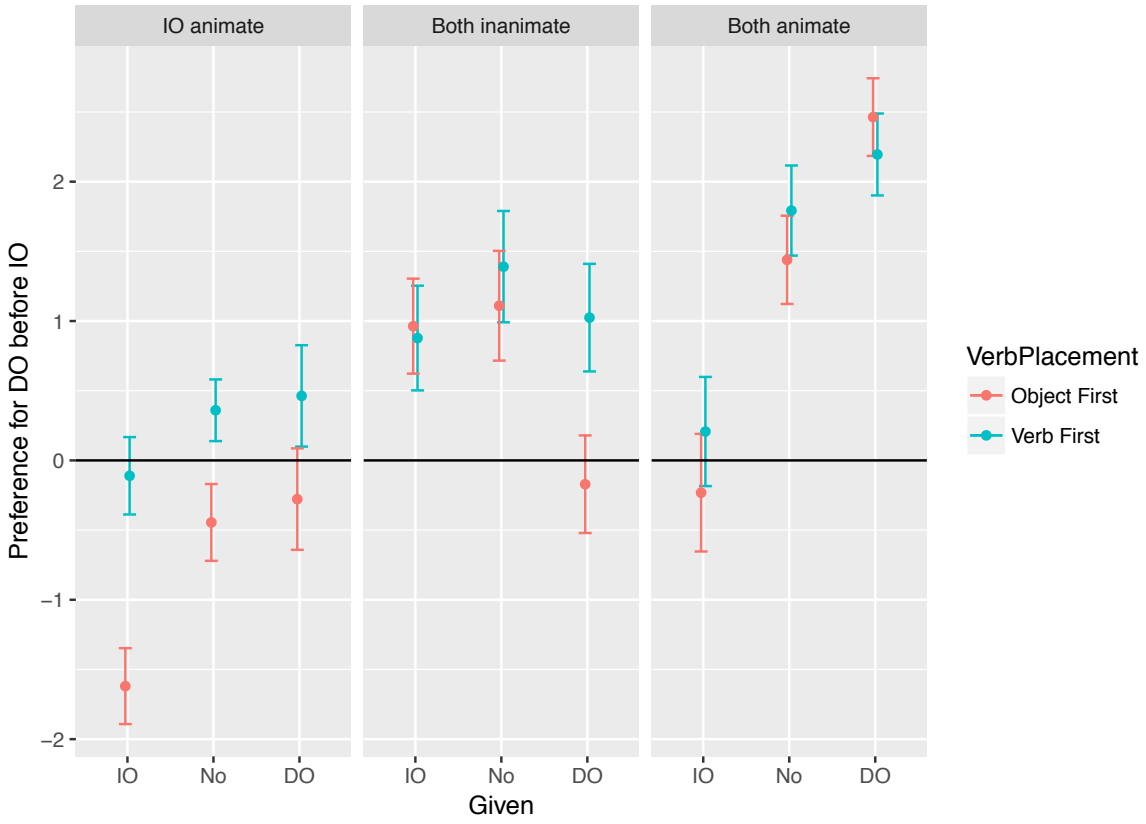
These results confirm that all of the factors are influential, but do not tell us anything about their interaction. In the next section, we will look into the variation in word order preferences in different conditions.

5.2 The influence of animacy, givenness, and verb placement on word order preference

The analyses in the previous section showed that all factors affect word order preference to a high degree. Figure 1 shows the IO-DO and DO-IO preferences in the task as a result of animacy, givenness, and verb placement. The examples with explicit focus are excluded from the data in Figure 1, because the additional factors of [+/- focus] would have made the graph unintelligible. The graph was plotted with a 95% confidence interval: if the two bars do not overlap, the difference is significant at a p-value <0.05; this graphical visualization of significance is valid for the entire figure: within a condition and for comparing conditions.

In Figure 1, we can see the interaction of the factors: the participants' preferences are grouped into three sections, based on the animacy values of the objects: IO, none, and both; givenness values are represented on the x-axis: IO, No, and DO for each animacy section; the y-axis represents the preference of DO-IO order: the bar below the 0 line signals a preference of IO-DO order, while the bar above the 0 line signals a DO-IO preference; the colors of the bars represent verb placement: the red bar is object-first (IVD and DVI), while the blue bar is verb-first (VID and VDI); which one is preferred depends on the position of the bar with respect to the 0 line.

Figure 1: Interaction of animacy, givenness, and verb placement



The animacy effect is clear in the graph, as the preference shifts progressively from IO-DO to DO-IO as the animacy becomes more balanced: we can see that from the bars moving from the lower part of the graph towards the top part. However, we expected the two conditions with balanced animacy (No and Both) to give similar results, but, as we can see from Figure 1, that is not the case. A possible reason for that is the fact that examples with no animate objects are difficult to convey, and,

even when on the surface level both are inanimate, the IO is never truly inanimate. For example, look at the following sentences used in the task[3]:

(7) a. I would like to ask you for a favor because you like across the lawyer's office. *Please bring the lawyer's office these documents.*

b. I hate it when I get my things dirty. *Again, I have to bring my silk dress to the drycleaner's*

The IOs used here as inanimates ('the lawyer's office' and 'the dry cleaners') can very easily be intended as 'the lawyers in the lawyer's office' and 'the staff at the dry cleaner's' respectively, and are thus more animate than 'the documents' or 'my silk dress' that were used as respective DOs in these examples. Conversely, in cases when both objects are animate, such as 'The professor told his assistant not to send anyone to his office. *But the assistant nevertheless sent the professor a student…*'[4] both the IO (professor) and DO (student) have the same degree of animacy, and this condition is truly balanced in this regard. This can explain why the acceptability values in No-animate conditions are in-between the IO-animate and both-animate conditions.

The givenness effect can be observed within each animacy quadrant, as the bars for the IO-given and DO-given conditions are significantly different from each

[3] Note that the sentence in Italics represents the target sentence, everything before that sets up the context. Each of the target sentences was given in the four word orders analysed here.

[4] The target sentence is marked in italics.

other. As previously specified, an object was considered given when it was mentioned in the context sentence preceding the target sentences. Thus, an example of a given IO (guests) is a context like 'We are having guests for dinner tonight. I have to go home and cook, *because I will serve the guests lasagna*', while a given DO (my aunt) would be 'My aunt is very old, but generally in good health. This morning she got suddenly sick *so I brought my aunt to the doctor*'. The bars of the IO-given conditions tend to be in the lower part of the figure (IO-DO preference), whereas the DO-given conditions have the bars significantly higher in the figure (DO-IO preference) when compared to the IO-given conditions. The DO-given values pair with the No-given values in the IO-animate and Both-animate conditions, which means that DO-IO is the preferred order both in cases of neutral and DO givenness.

We can observe the preference for verb placement by looking at the distance between the red and blue bar in each condition. Verb placement plays a role when the IO is animate (the bars are far apart, especially in the IO-given condition), not so much in the other conditions, since the two verb placement bars have a big overlap. An exception is the condition of given DO and No-animate object. This example thus requires some additional attention, and we need to look at the judgment values and the example itself. In this example ('I am filling in an application for a grant, the deadline is tomorrow. *I have to hurry up and send the application to the ministry*'), the given DO is "the application" and the IO is "the ministry"; the IO is in the dative case as the rest of the data set, but it might have been interpreted either as a location

or as the 'people working in the ministry'. Caused location (Levin, 2008) is not a factor that we have accounted for in the task, and we do not know what effect it might have on word order. For a more detailed overview, the means for every word order in each condition are presented in Table 7. We can see from Table 7 that a high judgment value for both VDI (4.29) and IVD (3.89) is causing the irregular distribution of the bars in Figure 1, so that both object order and verb placement play a role.

Table 7: Means of word orders for the conditions represented in Figure 1:

Givenness	VDI	DVI	VID	IVD	Animacy
IO	3.39	2.58	3.51	4.19	IO
No	4.03	3.82	3.67	4.27	
DO	3.55	3.42	3.71	4.18	
IO	4.54	3.48	3.67	2.52	No
No	4.08	3.92	2.69	2.81	
DO	4.29	3.71	3.26	3.89	
IO	3.65	3.65	3.45	3.89	Both
No	4.24	4.46	2.45	3.02	
DO	3.89	4.58	1.69	2.12	

5.3 Comparison of the effect of focus and givenness

Focus was excluded from the analysis in the previous section in order to have a straightforward graphic representation of the influence of two factors. Since focus and givenness are in complementary distribution in this task, here we will analyze whether word orders are accepted differently in conditions where the focus is explicit (with wh-questions) compared to the condition where one of the objects is simply new. Figures 2 and 3 show the acceptability judgments for the IO-animate and both-animate conditions respectively. The two figures are divided into two sections, based on what is given (DO or IO): in case of a given DO, the IO is considered new or in focus, depending on the presence/absence of a question, and vice versa. The presence of explicit focus is expressed on the x-axis: if the context sentence did not have an explicit question asking about the new object (examples 1 and 2), then we do not consider the object as being in focus; conversely, if there was a question asking for the object (example 3), then the object is focused. Examples with no explicit focus were already looked into in the previous figure—here, they are reintroduced for comparison purposes. The word order preference and verb placement are marked as in Figure 1. We expect explicit focus to have an extra effect on top of the givenness effect, which will strengthen the preference for a specific word order.

Figure 2: Comparison of explicit and non-explicit focus conditions when IO-animate

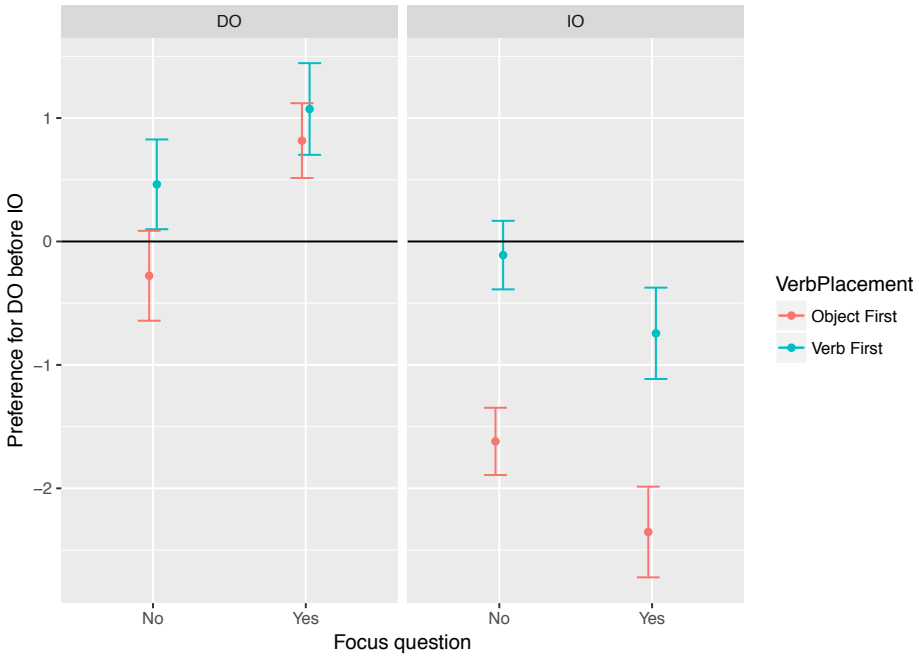
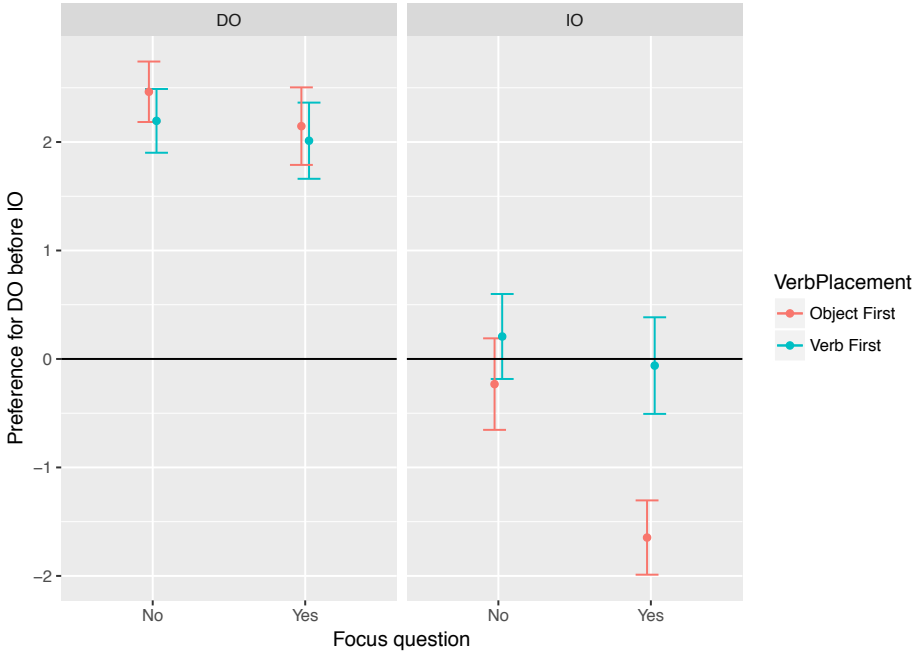


Figure 3: Comparison of explicit and non-explicit focus conditions when Both-animate



Figures 2 and 3 suggest that having an object in focus does not change the response trend, as it is the same in the two focus conditions (No and Yes). Overall, we can see that focus strengthens the preference from the condition where there is no explicit focus; this difference is significant when the bars do not overlap. So, in Figure 2 (IO-animate) in the DO-given quadrant, where the IO is new or in focus, there is a significant difference regarding IVD, which is well accepted when the IO is not in focus, but only IO-final orders are accepted when there is an explicit question asking about the IO. This is only a quantitative effect of focus, as preference for a certain word order is strengthened, not altered, when compared to the condition with a simple given/new distinction.

In the IO-given quadrant, where the DO is either new or in focus, the trend of responses is the same; however, based on the position of the bars, we can see that IVD is judged as significantly more acceptable when the DO is in focus, and VID is marginally better accepted, as the two bars have a minor overlap.

When both objects are animate (Figure 3), there is no difference in the judgments when the IO is new/focused; there is, however, a significant difference for the acceptance of IVD, since it is much better accepted when the DO is in focus compared to when it is just new information. Therefore, for this condition, there is also a qualitative effect of focus, because when there is no focus, there is no preference of either IO-DO or DO-IO, but when the DO is focused, IO-DO is accepted significantly more.

Animacy does not seem to play a role, as the word order preferences are fairly similar in Figures 2 and 3, based on what is in focus. There is an observable animacy effect in the condition when neither object is in focus, i.e. when the subject is focused. These examples are not represented in the graphs, but we provide the means of the judgments in Table 8, along with the other means of the focus condition. These means show how the preference of word order depends on the animacy value.

Table 8, as mentioned, presents the means of the data in Figure 2 and 3; some of the values are repeated from Table 7, in order to facilitate a direct comparison of the conditions in question.

Table 8: Means of word orders for the conditions represented in Figures 2 and 3

Focus/new	VDI	DVI	VID	IVD	Animacy
IO-new	3.55	3.42	3.71	4.18	IO
IO-focus	4.02	4.02	2.95	3.20	
DO-new	3.39	2,58	3.51	4.19	
DO-focus	3.19	2.46	3.54	4.56	
IO-new	3.89	4.58	1.69	2.12	Both
IO-focus	4.01	4.54	2.00	2.40	
DO-new	3.65	3.65	3.45	3.89	
DO-focus	3.19	2.46	3.25	4.10	
S-focus	3.34	3.18	3.56	3.84	IO
S-focus	4.45	4.46	2.52	2.59	Both

5.4 Widest contextual applicability

We had predicted that the word order with the widest contextual applicability will be highly accepted across all conditions. Here, we will see if there is such a word order and which one it is. Figure 4 depicts the judgment of the four word orders. However, again due to a simpler graphic representation of factors, the conditions with focus were not included. The full array of judgments can be seen in Tables 7 and 8.

Figure 4: Means of each word order per condition

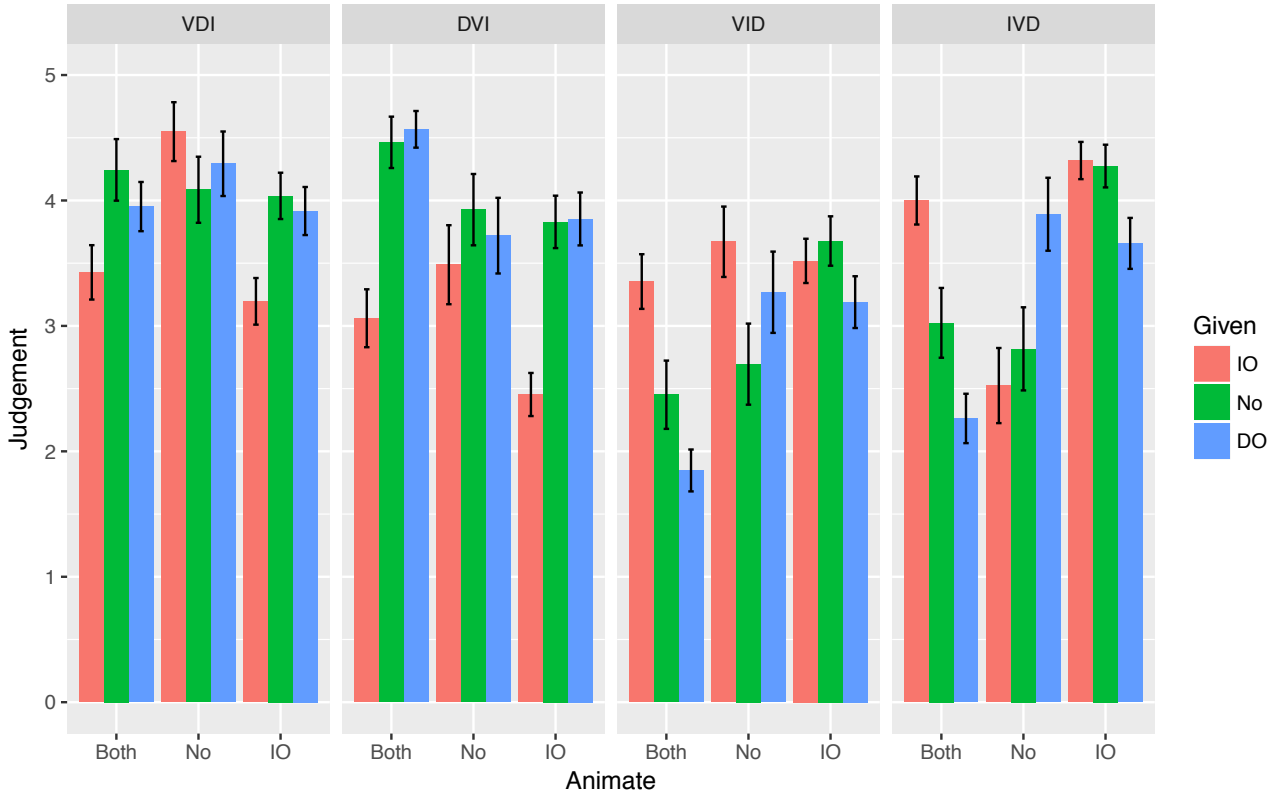


Figure 4 clearly shows that there is a difference between DO-IO and IO-DO orders, as the former are overall judged as more acceptable than the latter. Recall that in the previous sections, IVD was judged more highly than VID, and it is obvious from Figure 4 that the observed difference is due to an overall low acceptance of VID.

Between the two DO-IO orders, VDI seems to be overall better accepted, since it has a higher judgment value than DVI in 6/9 conditions in Figure 4. It is better accepted in all conditions where neither object is animate (no-animate), and it is also much better accepted than DVI in the condition with IO-animate and IO-given; here, DVI is at the limit of grammaticality with a mean score of 2.58. Our prediction was that the verb-first orders would be better accepted. However, we found that VDI is the most widely accepted order, but VID, as previously mentioned, is the least accepted order.

We also made a prediction about the neutral context, namely that the order that is most widely accepted through the survey, should be the word order with the best score in the full neutral context. In Figure 4, the neutral context is the green bar (No-given) of the first and second set of columns (Both and No-animate). DVI seems to be more prominent when both objects are animate, while VDI has the best judgment in the No-animate condition. Either way, there is a very consistent difference between DO-IO and IO-DO orders, and the difference between VDI and DVI is minimal in both neutral conditions. As predicted and based on the finding above, VDI is the best accepted word order, but the high acceptance of DVI places it in a more prominent

position than we expected, indicating that the position of the verb might not be relevant for differentiating the two DO-IO orders.

6. Discussion

Here the data from the Results section will receive a more thorough explanation, and we will indicate how the data fits the predictions made for the research questions.

The results showed that animacy, givenness, and focus influence word order preference, and that there is an interaction of the three factors.

In Figure 1, we have seen that IO-DO orders are preferred to DO-IO only when the animacy is prototypical, along with the preference for object-first, as IVD (mean=4.19) is preferred over VID (mean=3.15). The role of givenness starts to emerge when animacy is balanced, as the IO-DO order becomes less preferred, along with verb placement. When neither object is animate, the preference for DO-IO becomes stronger, and the relevance of verb placement decreases. This indicates that VDI and DVI are equally accepted in the specified conditions. This is not the case for VID and IVD, as the speakers showed divergent preference in favor of IVD in contexts where the preference for IO-DO orders were expected to surface. When both objects are animate, the givenness effect becomes very clear, as the IO-given condition shows a preference for IO-DO, while the two other givenness conditions group together with a DO-IO preference, reaching the highest values of DO-IO preference in the survey. The two neutral conditions (No-given in No- and Both-

animate) have very similar results and a preference for DO-IO. The results from the neutral conditions thus indicate that DO-IO order corresponds to the basic order, while the fact that this preference surfaces also in contexts of balanced animacy, indicates that animacy is a very relevant factor. The prototypical distribution of animacy can explain the vast majority of VID occurrences in naturalistic speech.

With regard to focus, we found a quantitative and qualitative difference in word order judgments when we compare the conditions with a given-new contrast to the conditions with a given-focus contrast. The quantitative difference consists of the focused object having a stronger effect on word order preference than simply an object that is new. The qualitative difference consists of a significantly stronger preference for IVD in the DO-focus condition, when compared to the IO-given condition with no explicit focus (Figure 3). This means, that in the condition with focus, having more contrast between the two objects is preferred; and thus, IVD, which places the objects far apart, is preferred to VID. Thus, VID once again is not a preferable candidate. The effect of animacy in the conditions with focused is diminished as the mean judgments are the same for the IO-focused conditions in both animacy conditions, as well as for the DO-focused conditions (Table 8). Its effect is only visible in the conditions where neither object is in focus (subject-focus). Here, the preferences follow the already observed trend: IO-DO orders are preferred when animacy is prototypical, while DO-IO orders are preferred when it is balanced. This entails that focus is a stronger factor than animacy, unlike the given-new

contrast, in which animacy more strongly affects word order preference (Figure 1). Thus, the study revealed that all three factors (animacy, givenness, and focus) contribute to word order preference in Croatian.

Moreover, the data provided is enough to postulate a hierarchical ordering of the factors. Animacy was found to be an extremely relevant factor, as the effects of givenness surface only when animacy is balanced. Thus, we can safely conclude that animacy is a stronger factor than givenness. However, when focus is involved, the effects of animacy are diminished, as IO-final and DO-final orders are preferred when IO and DO respectively are in focus, and the animacy effect is only visible when neither object is in focus. Thus, we propose that focus is the most influential factor, followed by animacy, and finally givenness.

The focus>animacy order is in line with results obtained by Røreng (2011) from German corpora, for which she finds that both the background-focus structure and animacy are responsible for the ordering of objects in ditransitive structures, but focus is the more relevant factor. Givenness does not seem to be a strong enough factor that would permit us to claim that Croatian follows the given>new principle, even though givenness does have an effect; hence, we place the relevance of givenness along the lines of what ŠimíkWierzba and Kamali (2014) have claimed for Czech. Perhaps, in order to observe a more sound effect of givenness, arguments that are higher in the Givenness Hierarchy (GundelHedberg and Zacharski, 1993), such as discourse topics, should also be considered.

An outline for a possible reasoning regarding this hierarchy follows. Animacy is a semantic property of a referent, and, as such, is it constant no matter the context. Whereas, any argument can be given or in focus, and this property is not constant, meaning that it can change as the discourse progresses. The current study did not focus on a larger discourse, as we tested isolated test items. Nevertheless, speakers are very likely aware that pragmatic properties were not constant and were established *ab ovo* for every argument in each test item. A possible reason why focus proves to be stronger than animacy, while givenness is weaker, is the very straightforward setup that we had for focus, i.e. as an answer to a wh-question. The given argument was, of course, mentioned in the context, but the contrast between given and new might not have been strong enough, as some of the new arguments could have been implied.

Our second prediction was that the word order pairs (VID and IVD, VDI and DVI) will have similar results in each condition, and this is what we find for most of the conditions (Tables 7 and 8). The study has also revealed that DO-IO is judged better than IO-DO across the task, and, more precisely, that the word order with the widest contextual applicability is VDI (Figure 4). Surprisingly, VID, which is a highly frequent word order in naturalistic data (HrAL (Kuvač Kraljević and Hržica, 2016) and the DODB database (Velnić, 2014), is the least accepted word order in the task, as it is judged worse that other word order across the task. We have thus found a discrepancy between the naturalistic data and the survey judgment. This discrepancy

is not uncommon, and has been also found in other studies, such as McdonaldBock and Kelly (1993). The cause for the VID being highly attested but not preferred is that, in the naturalistic data, the vast majority of IOs are animate and, moreover, expressed with clitics (130 out of the 180 occurrences examined from HrAL) and consequently fixed in second position; while the AJT tested a different array of animacy contexts that are not frequently attested in naturalistic data, and thus reveals a preference for the DO-IO, which is not mirrored in every day speech. Therefore, our prediction that VID and VDI would be the better accepted word orders was not borne out, since only VDI is well accepted across the task, while VID is definitely not. A possible reason could be that VDI is, in fact, base-generated, as Gračanin-Yuksek (2006) claims, and it is thus well accepted across contexts; conversely, the ambiguity of VID could have divergent effects on this word order when its production and acceptance are compared. The results we have obtained thus show empirical evidence for DO-IO being the basic word order in Croatian ditransitives, in contrast to IO-DO being more frequent in naturalistic speech. Different effects on production and comprehension have been previously noticed (McdonaldBock and Kelly, 1993), as speakers are more permissive in production than in comprehension. The large amount of VID in naturalistic speech is most definitely related to the animacy of the IO, however the claimed ambiguity of the VID could also contribute to it being the preferred order to produce because it is underspecified. Conversely, with regard to comprehension, listeners will have a preference for structures that are

not ambiguous, and thus will not prefer the VID, which is what we see across the conditions in our task.

7. Conclusions

In the AJT, most of the word orders were judged with a high enough value, in order to be considered appropriate for a certain context, entailing that Croatian indeed allows an array of word orders even when it comes to more complex structures such as ditransitives. The speakers were also not biased for any of these orders (Table 4), so the differences in acceptability are due to the different pragmatic contexts.

The study found that animacy, givenness, and focus contribute to the word order preference and interact in doing so: the effect of givenness is strengthened as animacy becomes balanced, and focus enhances the established givenness effect as the preference for a certain word order is clearer when an object is focused, compared to the examples with no explicit focus.

The study also reveals an overall preference for DO-IO orders, and that VDI is the word order with the widest contextual applicability, as this word order is highly accepted across all conditions, neutral conditions included. VID is the word order with the worst judgments overall. Thus, contrary to our prediction, verb-first orders are not both more commonly accepted. Our results nevertheless indicate, according to previous theoretical claims, that VDI is base-generated. The base generation of IVD cannot be confirmed in light of the current data, as this order is accepted best

only in semantically favorable conditions: when the IO is animate (prototypical condition and Both-animate). This order is not preferred when the factors are not in its favor, on the contrary, it is very poorly judged, and could even be considered unacceptable, in conditions when the IO is in focus or simply not given. The ambiguity of the VID is possibly confirmed by our data, as we found a discrepancy between the AJT and the naturalistic data. This can be attributed to the different status that ambiguous structures have in production, when compared to comprehension.

The position of the verb was found to be marginal, as both DO-IO orders are overall better accepted, while preference for IVD between the two IO-DO orders is most likely caused by the overall low acceptance of VID, rather than a preference for a clause-initial IO.

Overall, this study shows how relevant animacy, givenness, and focus are, and reveals a high acceptance of DO-IO orders that has, so far, been unnoticed due to a frequent production of IO-DO orders. This indicates that claims made based on purely syntactic or naturalistic data should be reconsidered, since context plays a crucial role in word order choice and also in determining what is underlying.

The reason behind an overwhelming amount of IO-DO productions in naturalistic data is the animacy of the IO because, as the study shows, the IO-DO preference declines as animacy becomes balanced. The study also shows that, with regard to givenness and focus, focus is stricter than givenness, as the conditions with explicit focus had clearer preferences when compared to conditions of a simple

given/new contrast, where both object orders were judged more similarly to each other.

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