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 (direct/indirect) preference 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 reveals a preference for DO-IO orders once animacy is neutralized and found that focus influences object order more strongly than a simple given/new contrast. The preferred word order is verb-direct-indirect because of its high judgment score across the task, indicating a wide contextual applicability.

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 find out 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). Some of the factors discussed in De Marneffe (2012) are not included in the present study. The reason for the exclusion is summarized in the next paragraph.

This study focuses on pragmatic rather than 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 the second position (Schütze, 1994). As

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[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.

clitics are used more frequently than pronouns, the object that is realized by a clitic will always occur in this position. Thus, clitics have been omitted from the study as their placement is purely syntactic, even though the choice of referring expression is clearly determined by pragmatics. Furthermore, as pronouns typically signal given arguments and are light, they have been excluded as well. Thus, in this study we will consider NP objects, and as we constructed them with equal length, as weight is not a factor in this study. We also decided not to test for definiteness in this task due to an imbalance of the status of definite and indefinite markings: Croatian does not have obligatory definiteness marking, but has more means for marking definiteness (demonstratives, possessives, and possibly some types of adjectives) than indefiniteness, the latter including the quantifier *neki* 'some' or 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.

Thus, an acceptability judgment task (AJT) was set up, with an array of conditions with different values of 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 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. 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 one in neutral conditions (no-animate/both-animate and no-given).

The paper is structured as follows: we provide a background section divided in two parts, the first one outlining the Croatian ditransitives (section 2.1) and the second one describing the factors and their effects (section 2.2). In the following section, we lay out the research questions and predictions (section 3). Then we proceed with a methodology section (section 4), and the results (section 5) followed by a discussion (section 6). The last section is reserved for the conclusions.

2.1 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, whereas 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). So, the relative ordering of the two objects should be the result of pragmatic factors and not of thematic role. 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. Jabuku   Ana   daje   Marku. - DSVI

   apple-ACC anne-NOM gives-3rd.SG   mark-DAT

f. Marku   Ana   daje   jabuku. – ISVD

   mark-DAT anne-NOM gives-3rd.SG apple-ACC

In the current study, we focus on the boldfaced orders (1a-1d), excluding the subject (S) because Croatian is a subject-drop language. When the subject is omitted, (1e) and (1f) correspond to (1d) and (1c) respectively. We do not take the verb-final possibilities (IDV and DIV) into consideration.

     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). In terms of verbal (V) position. 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		

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[2] Unfortunately, DIV was not included in the study as the HrAL corpus of spoken Croatian was opened 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 because it was the only source of spoken Croatian available at the moment.

A closer look to the data reveals that the high amount of IO-DO orders might be due to extensive use of clitic form of the IO (n=130). When these 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.

The verb-final word orders have been excluded due to their ambiguity with respect to the relative and absolute interaction of word order and definiteness (Šimík and Burianova, 2017). According to Šimík and Burianova (2017), if the definiteness of a bare NP is related to its relative position (i.e. *relative generalization*) in a sentence, it is definite when it is preverbal; whereas if the relation of word order and definiteness is absolute (i.e. *absolute generalization*), then an NP is definite when clause initial. In this study, we are interested in the positioning of the two objects in a double object structure, so we have reformulated the two generalizations in the following way: we consider relative the relation of word order and givenness (definiteness) when the two objects are adjacent and both follow the verb (VID, VDI); while the absolute relation is when the object is clause initial, thus preceding the verb (IVD, DVI). Both of these relations maintain the given>new order. Consequently, IDV and DIV are excluded because the objects are both preverbal and adjacent to each other, thus the first object is in both the relative and the absolute position. The different implications of these two relations will be further explained in our predictions.

When a language has two syntactic structures for expressing the arguments of a ditransitive verb, it is referred to as Dative Alternation (Oehrle, 1976:7). An example of Dative Alternation in English is found in (2) with the Prepositional Dative (PD) in (2a) and the Double Object Dative (DOD) in (2b).

(2) a. John gave a book to Mary.

b. John gave Mary a book.

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. 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.

With respect to the relative relation (VID and VDI) and the absolute relation (IVD and DVI) of word order and givenness, the preferred relation that Croatian speakers have should be revealed in the more contextually bound conditions (when one object is given); while the word order with the widest contextual applicability will be observed based on the overall judgments and the judgments of the neutral conditions.

2.2 Factors: animacy, givenness, and focus

Now we move on to describing the effects of the factors involved in this study. The effect of animacy on word order can be referred to as the animacy-first effect. This entails that in animacy-mixed pairs, 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 and 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. Thus, in ditransitive sentences, animacy is strongly related to the IO.

Animacy is a semantic property (it does not depend on the context) and this may cause animates to be more conceptually accessible than inanimates. Conceptual accessibility is related to how retrievable an item is from memory

(McdonaldBock and Kelly, 1993). According to Branigan, Pickering and Tanaka (2008) this tends to make them highly accessible conceptually and thus 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. Van Nice and Dietrich (2003) explored the relation of animacy and word order on passive constructions in German by using picture description tasks. The images depicted transitive actions with four combinations of animate/inanimate agents and patients. They found increased passivisation when only the patient is animate; conversely the condition with an animate agent and inanimate patient elicited the least passives. They concluded that it is accessibility that leads to the selection of animate agent first. Gennari, Mirković and Macdonald (2012) investigated production preferences related to animacy in English, Spanish, and Serbian relative clauses. The results showed that animacy exerts a strong influence when passive relative clauses were chosen in English, but less so for the other two languages, and especially for Serbian because passives are infrequently used in general. The results of most interest for the current study are the ones on Serbian, due to its close relation to Croatian. Serbian speakers do not need to use passivation in order to start the sentence with the animate referent; because of free word order the referents can simply be rearranged. This is why the use of passive is not necessary to ensure that the (animate) patient is placed first. They find that in Serbian, case marking dominates production choice (p.156). Therefore, the results find that Serbian speakers produce active sentences overwhelmingly across all animacy conditions. The authors conclude that the effect

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of animacy is minimal in Serbian for this task. However, this is not necessarily due to the limited effect of animacy, but rather due to the fact that passives are simply not extensively used. Thus, the effect of animacy should be sought elsewhere. From this perspective, our test provides a better testing ground for the effect of animacy, since it involves judgments on word orders that do not include passives.

In sum, we can conclude that animate elements tend to precede inanimate ones and that languages have mechanisms that provide a possibility for the animate-first order. Passivisation will thus be used in some languages, while in free word order languages the referents will simply be rearranged. The same can be applied to the Dative Alternation: in some languages speakers will have to use different structures in order to accommodate the desired word order, while in free word order languages this can be accomplished with a different ordering of arguments. With Croatian being a free word order language, a word order rearrangement is enough to accommodate the animate-first tendency.

With regard to givenness, we want to investigate whether the given before new (given>new) principle also applies to Croatian. According to this principle, Firbas (1964), referring back to Mathesius, claims that in languages such as Czech, sentences open with a theme and close with a rheme which roughly correspond to given and new information. 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 in a sentence was already mentioned in connection with the notion of Harmonic

alignment (De Marneffe, 2012) above. Other ways of organizing sentences according to information structure are: theme-rheme (Firbas, 1964), topic-comment (Gundel, 1988), and background-focus (Jacobs, 1986). All of these will be discussed in more detail below. Given information is thus related to background information and new information is related to focus.

For Slavic languages, most of the research on the given>new principle has been conducted on Czech (Firbas, 1964, Kučerová, 2007, Kučerová, 2012, Šimík, Wierzba and Kamali, 2014), and Polish (Grzegorek, 1984, Siewierska, 1993). We have already seen from Firbas (1964) that themes tend to precede rhemes in Czech. Other studies conducted on Czech suggest that only SVO, the basic word order, can be used in a variety of contexts, while other orders can only be used when they comply with the given>new principle (Kučerová, 2007). In Kučerová (2012) the research is expanded to Russian and Serbo-Croatian; she concludes that in these languages given elements precede new ones, and a new>given order is ungrammatical. In contrast to that, Šimík, Wierzba and Kamali (2014) claim that given objects can occur anywhere in the sentence, excluding the final position when there is neutral intonation, which has sentence final stress in Czech. Thus, the authors relate givenness to prosody, as a given argument cannot be stressed. The final position is possible for a given argument as long is it not stressed, which means that the sentence does not have neutral intonation. This approach makes the role of the given>new principle less strict, since also prosody interacts with word order to convey what is given. With regard to Polish, Grzegorek (1984) states that the communicative

principle is more relevant than the grammatical principle for ordering the arguments in a sentence: old (given) information is placed before the verb while the information in focus (new) is marked by clause final position. Siewierska (1993) focuses on the topic>comment structure; but for the purposes of this literature review the topic can be compared to what is given and the comment to what is new, even though the two concepts do not map directly on to one another. In her study conducted on a Polish corpus of transitive sentences, the effect of weight is compared to the effect of givenness. The results showed that weight does not account for the attested word orders and thus the topic-comment structure must be responsible for the word orders in the corpus.

With regard to focus as a factor influencing word order[3], Pereltsvaig (2004) defines focus as the new, non-presupposed, and informative part of the clause; focus is thus the part of the information that is communicatively more relevant than the background (Klabunde, 2004). Gundel (1999:295) refers to this kind of focus as 'semantic focus': it 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. This is the method we use to elicit our focus conditions (see Methodology section).

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[3] In this paper, we are only concerned with focus as an element contributing to information structure. Contrastive focus is not included in this study.

Focus can be manifested in a language in various ways and Büring (2009) lists the following: pitch accent placement, prosodic phrasing, constituent ordering, use of special focus morphemes, or not marking focus at all. The current study was an acceptability judgment task with no audio, and it is thus unable to reveal if Croatian uses intonation as a means of focus marking. The manifestation of focus we are interested in this study is constituent ordering.

Røreng (2011) states that the focus of a sentence contains the main message, and that in German, word order is used to mark focus. She conducted a corpus study in German and found that the variation in object ordering in ditransitives is due to animacy and focus-background structures, with the animate object preceding the inanimate and the backgrounded object preceding the focused object. 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. This entails that in the naturalistic data, the majority of IOs is animate, and a lot of them are also part of the background.

For Russian, Kallestinova (2007:53) conducted a series of comprehension and production experiments on word order. The experiment of particular interest for this study is the one in which the production of various word orders of ditransitives with focus on S, IO, and DO is tested. Her data reveals that there is a very strong tendency to produce SVID and SVDI, and she considers those to be the basic ditransitive word orders. The second most frequent orders are SIVD and SDVI, ensuring that the focused object is always in final position.

Focused information is thus often defined as corresponding to new information; but instead of being contrasted with given information, it is contrasted with background information (background>focus). Background and focus often amount to a simple given/new distinction (Klabunde, 2004) and thus focus and givenness represent opposite sides of the same phenomenon, because like new information, focus follows what is the background, that is, given information. However, in our task, focused information is not simply new, as the focused element is being explicitly asked about (Gundel, 1999) and thus adds salience to the referent that is explicitly in focus when compared to the referents that are only new. Consequently, in this task, givenness and focus cannot have the same referent.

Following the presented literature, the given>new principle should also apply for Croatian, but no explicit tests have been conducted on this matter. Therefore, the judgments of given objects should reveal if there is preference for the given object to precede the new object; in addition, the setup of the focused object not being simply new 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 same givenness condition when the object is simply new. Animacy is part of this study because of its close relation 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 objects. We expect to find an effect as described for other languages, but the present research will reveal more about the interaction of these factors on word order in Croatian.

3. Research questions and predictions

The present study aims to find out if and how the three factors 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 animate-first order?

2. Does Croatian follow the given>new order?

3. Does Croatian follow the background>focus order?

4. How do these factors interact?

5. What role does the position of the verb play?

6. 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 see how influential a factor is. The survey 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

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new object is not in focus, and thus 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 also expected to play a role with regard to the preference either for the relative or the absolute relation of word order and givenness based on Šimík and Burianova (2017). Since this relation is linked to givenness, we expect to find a preference for either verb-first (relative relation) or object-first (absolute relation) word orders when one of the two objects is given.

When it comes to finding the word order with the widest contextual applicability, we predict that on of the less prominent word orders, where the object is not fronted so verb-first (VID and VDI), will be the most widely accepted one. According to Gračanin-Yuksek (2006) VID is structurally ambiguous and it has also been found to be the most frequently used word order in naturalistic data (Kuvač Kraljević and Hržica, 2016, Velnić, 2014). Thus, we expect it to be more contextually applicable, and this should result in it being more readily accepted across the task, especially in neutral conditions.

4. Methodology

The test consisted of an online acceptability judgment task (AJT) that provided different contexts consisting of 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 distributed over 18 targets. The experiment contained a total of 41 sentences including fillers. Tables 2 and 3 show the distribution of examples per contexts.

Table 2: 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		

We have seen various definitions of focus in section 2 and 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). Table 3 provides an overview of the target examples with focus.

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[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 not asked about like in the examples in table 2

Table 3: 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	

All the examples consisted of two sentences: the context sentence, that had the function to introduce the given object or to set the focus with a wh-question; and the target sentences which were presented in the four target word orders (VID, IVD, VDI, and DVI) randomized for each example. So, an object was considered [+given] if it had been mentioned in the context sentence, it was [-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 is 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) -(5) provide an example for each factor.

(3) CONDITION: Both Animate, No Given

  Context sentence:

  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):

  VID: Zato   je   bez   razloga   poslala   ravnatelju   učenika.

    because is-AUX without reason-GEN sent-1st.SG principal-DAT pupil-ACC

  VDI: Zato je bez razloga poslala učenika ravnatelju.

  IVD: Zato je bez razloga ravnatelju poslala učenika.

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

(4) CONDITION: IO Animate, DO Given

  Context sentence:

  A: Imaš   li   još uvijek   onaj   svoj   kalkulator?

  have-2nd.SG Q-particle more   still   that-ACC your-ACC   calculator-ACC

  B: Ne, nažalost   nemam,   sad koristim   onaj na   mobitelu.

no unfortunately do_not_have-1st.SING now use-1stSING that on   mobile

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

VID: Pred puno godina sam   dala   nećaku   kalkulator

      ago many years have-AUX gave-1stSING nephew-DAT calucator-ACC

VDI: Pred puno godina sam dala kalkulator nećaku

IVD: Pred puno godina sam nećaku dala kalkulator

DVI: Pred puno godina sam kalkulator dala nećaku

'A: DO you still have that calculator of yours? B: No, unfortunately I don't have it, now I am using the one in my mobile. Many years ago, I gave the calculator to my nephew.' (VID, VDI, IVD, and DVI alternatives are provided for the participant to judge).

(5) CONDITION: DO Focus, IO Animate

  Context sentence:

  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):

VID: Ponuditi   ću   kolegama   palačinke.

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

VDI: Ponuditi ću plačinke kolegama.

IVD: Kolegama ću ponuditi palačinke.

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 order in which the four word order targets were presented was randomized.

5. Results

First, we wanted to make sure that there is no bias towards any of the used word orders. 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 regarding 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). Following that, a likelihood ratio test was conducted: it consisted in using ANOVAs to compare the model with all the factors with 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 with 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 sentence was formulated with a wh-question or not (focus vs. non-focus). Then it was compared to a model that did not have 'question' as a variable. Thus, this model included the full dataset as the key comparison is between the examples with a question (given-focus distinction) and without a question (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 with 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
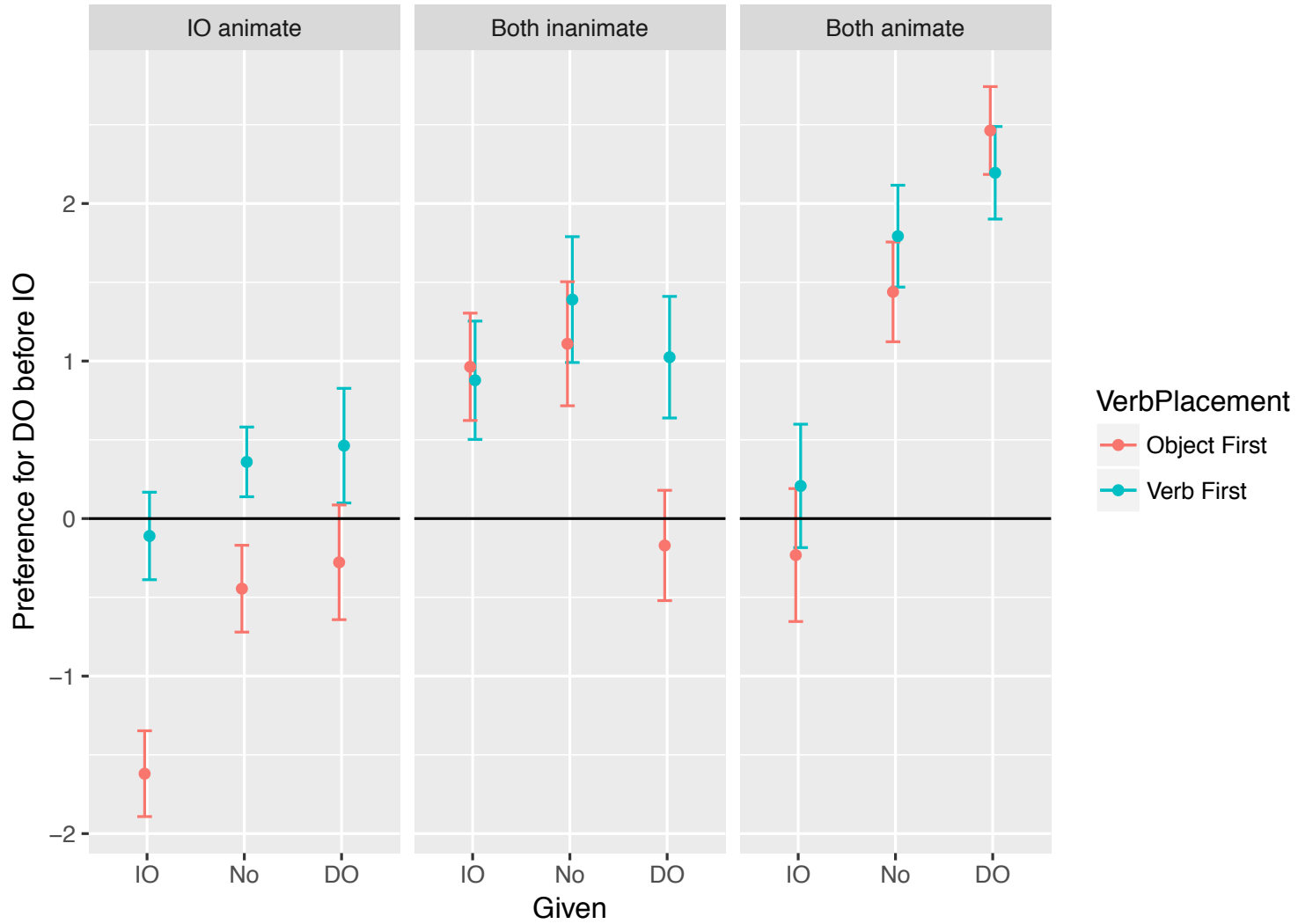
The analyses in the previous section showed that all factors affect word order preference to a high degree. Figure 1 shows the IO-DO and DO-IO preferences in the task as a result of animacy, givenness, and verb placement. The examples with explicit focus are excluded from the data in figure 1 because 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.

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 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.

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

For example, some of the IOs that were used here as inanimates are 'the lawyer's office' and 'the dry cleaners' and they 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 (e.g. IO='professor' DO='student'), they both 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: the bars for the IO-given and DO-given conditions are significantly different from each other: 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 have to look at the judgment values and the example itself. In this example, 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 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. 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. For a more detailed overview, the means for every word order in each condition are presented in table 7.

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 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.

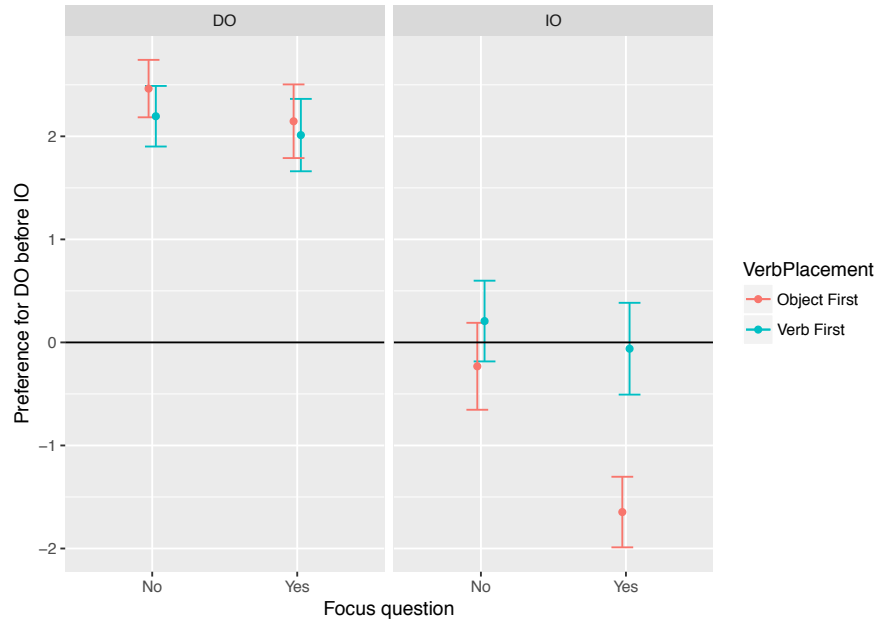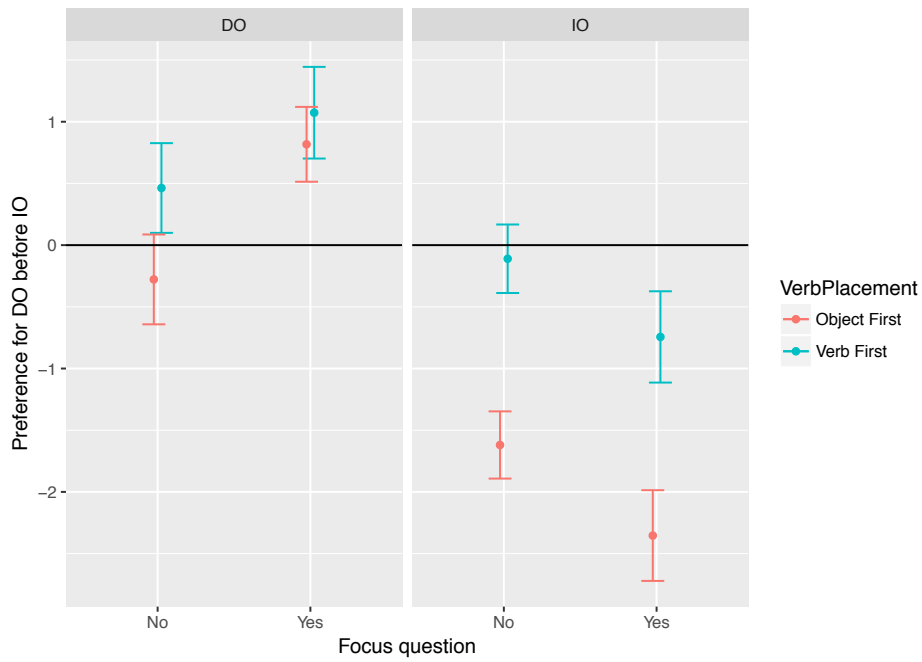Figure 2: comparison of explicit and non-explicit focus conditions when IO-animate

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 the acceptance of IVD that 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, but 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, but 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. So here 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.

The means of the data in figure 2 and 3 are presented in table 8; some of the values are repeated from table 7 in order to have a direct comparison of the conditions in question.

Table 8: means of word orders for the conditions represented in figures 2 and 3

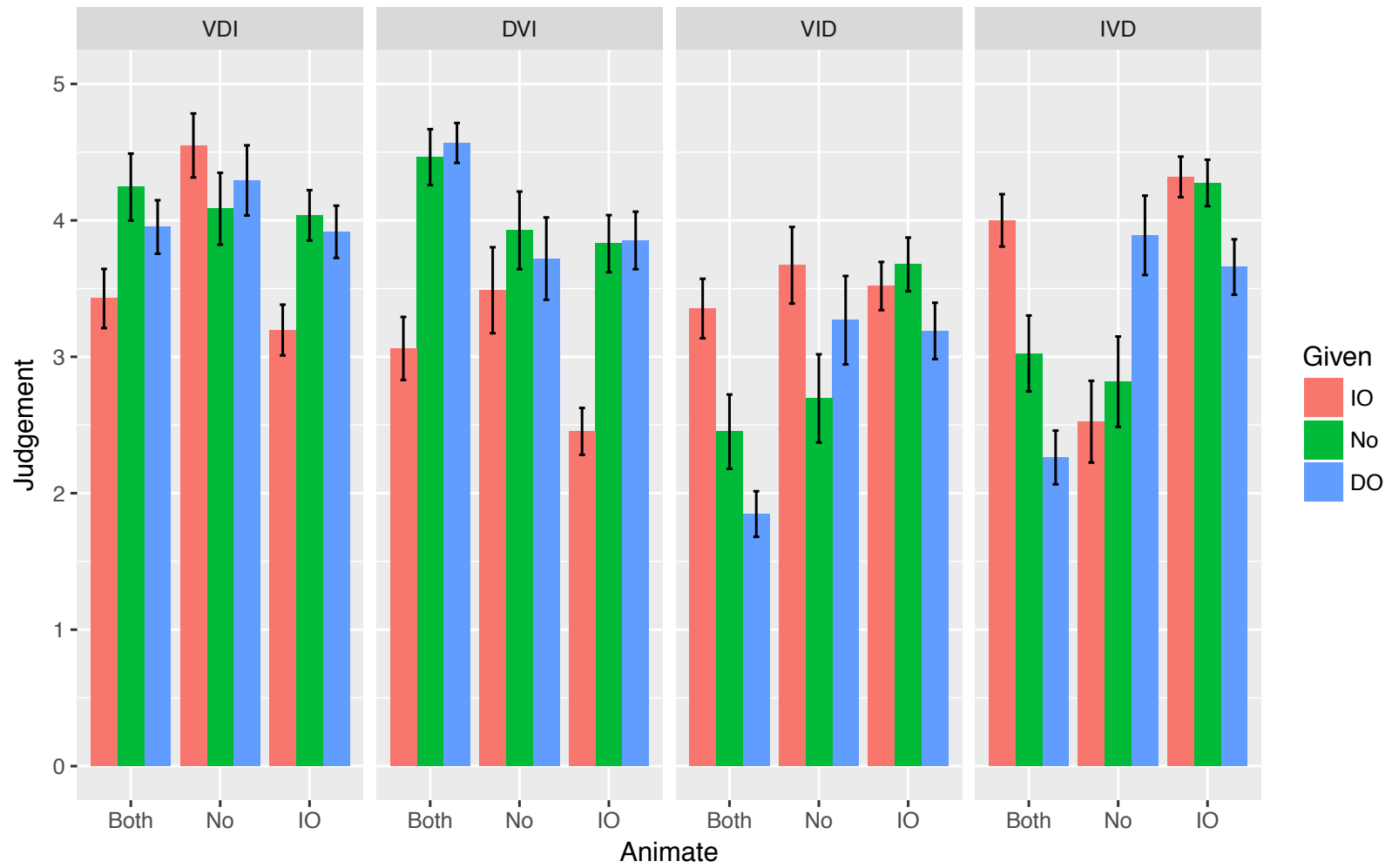| Focus/new	VDI	DVI	VID	IVD	Animacy
IO-new	3.55	3.42	3.71	4.18	IO
IO-focus	4.02	4.02	2.95	3.20	
DO-new	3.39	2,58	3.51	4.19	
DO-focus	3.19	2.46	3.54	4.56	
IO-new	3.89	4.58	1.69	2.12	Both
IO-focus	4.01	4.54	2.00	2.40	
DO-new	3.65	3.65	3.45	3.89	
DO-focus	3.19	2.46	3.25	4.10	
S-focus	3.34	3.18	3.56	3.84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

5.4 Widest contextual applicability

Our prediction was 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 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; but based on the claim of the ambiguity of VID, we considered it more likely to be the most widely applicable order. Contrary to that prediction, VID is the least accepted word order in the AJT. The possible reasons for that will be outlined in the discussion.

Figure 4: means of each word order per condition

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). VDI 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 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 as it was outlined in the literature and that there is an interaction of the three factors. In order to explain what the interaction consist of, an explanation of the progression of the figures from the Results section is in order. Figures 1-3 are relevant for observing the interaction of the factors, while figure 4 is necessary for establishing the order with the widest contextual applicability.

In figure 1, when the IO is animate and given we can see a strong preference for IO-DO over DO-IO as both bars are below the 0 line. This is the condition in the task with the strongest preference for IO-DO, as two factors (animacy and givenness) influence the placement of the IO. The preference for object-first is very strong in this condition as we can see that the IVD (4.19) is preferred over VID (3.15). We can see it from the two bars being far away from each other. Givenness plays a role as the IO-DO order becomes less preferred and verb placement is less relevant.

When neither object is animate, the preference for DO-IO becomes stronger, and the relevance of verb placement decreases. When both objects are animate there is a very clear givenness effect, 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 figures regarding focus (figures 2 and 3) show that there is a quantitative difference in word order judgments when we compare the conditions with a given-new contrast to the conditions with a given-focus contrast. This means that a focused object has a stronger effect on word order preference than simply an object that is new. A qualitative difference was also found: the preference for IVD is significantly stronger 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. The effect of animacy in the conditions with focus 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). The animacy effect becomes noticeable in the conditions where neither object is in focus (subject-focus). Here, the IO-DO orders are preferred when the IO is animate, while DO-IO orders are preferred when both objects are animate. This entails that focus is a stronger factor than animacy, unlike the given-new contrast in which animacy interacts more strongly with word order (figure 1). Thus, the study revealed that all three factors (animacy, givenness, and focus) contribute to word order preference in Croatian.

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 than 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 is animate and, moreover, expressed with clitics (130 out of the 180 occurrences found in HrAL) and are 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. Thus, 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.

From the contexts in which one object is given, we can attest whether the speakers prefer the relative or the absolute relation of word order and givenness. The prediction was that in these contexts we should observe a preference for either verb-initial or object-initial orders, depending on whether the speakers preferred the relative or absolute position of the given object. We consider VID and VDI having a relative ordering of the objects, while IVD and DVI having the absolute ordering. Taking figure 4 into consideration, the DO-IO orders do not seem to have different preferences, since DVI is preferred to VDI in the both-animate DO-given condition (means=4.58 and 3.89), but VDI is preferred in the No-animate DO-given condition (means= 4.29 and 3.71). In the IO-animate DO-given condition they are judged with the same score (VDI=3.55, DVI=3.42). Within the IO-DO orders there seems to be a preference for the absolute relation, since VID has a low acceptance across the task, so IVD is also better accepted in the conditions with the given IO (both-animate IO-given and IO-animate IO-given). Nevertheless, VID is strongly preferred to IVD in the No-animate

IO-given condition (means= 3.67 and 2.52). However, as previously mentioned, VID was poorly accepted across the task so perhaps the preference for the absolute relation within the IO-DO orders is caused by a dis-preference for VID rather than a preference for IVD. Thus, the adaptation of the relative/absolute distinction postulated by Šimík and Burianova (2017) for Czech, does not seem to hold for Croatian, as what we find is an obvious dis-preference for one of the orders, rather than a concise preference for verb-first or object-first order.

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 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. Thus, the position of the verb was found to be marginal as both DO-IO orders are overall better accepted.

VID is the word order with the worst judgments overall. Thus, contrary to our prediction, verb-first orders are not both more commonly accepted.

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. 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 with conditions of a simple given/new contrast where both object orders were judged more similarly to each other.

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