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Givenness and the Licensing of Object-First Order in German: The Effect of Referential Form

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1 Introduction

Speakers of German have many options to start a sentence. As an example, consider (1), which shows three alternative ways to express the proposition that a musician called a teacher.

(1) a. Active SO *Der Musiker hat den Lehrer angerufen.*
the.NOM musician has the.ACC teacher called
'The musician called the teacher.'

b. Active OS *Den Lehrer hat der Musiker angerufen.*
the.ACC teacher has the.NOM musician called
'The teacher, the musician called.'

c. Passive *Der Lehrer wurde von dem Musiker angerufen.*
the.NOM teacher was by the.DAT musician called
'The teacher was called by the musician.'

Sentence (1a) is an active sentence with the subject in the so-called *prefield*, that is, the clause-initial position of a main clause. This sentence accordingly occurs with canonical subject-object (SO) order. The two sentences in (1b) and (1c) show the two major means that can be used to start a sentence with the object argument,[1] namely, the patient argument in the case of example (1). Like sentence (1a), sentence (1b) is an active sentence, but with the object in the prefield and thus non-canonical object-subject (OS) order. Furthermore, this sentence is non-canonical in terms of thematic roles, with the patient preceding the agent. Sentence (1c) is the passive counterpart of sentence (1a). This sentence has non-canonical word order insofar as the patient argument precedes the agent argument. Because it is the patient that is realized as subject in a passive clause, sentence (1c) again starts with the subject and, thereby, shows canonical word order in terms of syntactic functions.

How do speakers decide which of the various word order variants to produce? This question has been investigated within both theoretical linguistics and psycholinguistics. Following the seminal work of K. Bock and colleagues (e.g., Bock & Brewer, 1974; Bock & Warren, 1985; McDonald et al., 1993), psycholinguistic investigations of language production have shown that speakers tend to produce sentences in which *highly accessible* referents occur in early positions.

[1]We use the terms 'subject' and 'object' for referring to surface subjects and objects, that is, NPs marked for nominative and accusative/dative case, respectively. The terms 'subject argument' and 'object argument' are used to refer to those arguments of the verb that are realized as subject and object in an active clause. In certain syntactic theories, these are also known as underlying subject/object or external/internal argument.

Accessibility in this context means the ease with which a referent can be retrieved from short- or long-term memory. For example, animate referents are more accessible than inanimate referents, leading to a preference for animate NPs to precede inanimate NPs during sentence production. When speakers of English have to produce a sentence with an inanimate subject argument and an animate object argument (e.g., *A thunderstorm surprised Peter.*), they often revert to a passive sentence (*Peter was surprised by a thunderstorm.*) because this is the major syntactic means offered by English to reorder subject and object.

Experimental investigations of German have revealed similar results. Speakers of German promote highly accessible referents to the sentence-initial prefield position, both, when accessibility is manipulated in terms of lexical-semantic properties including verb semantics and animacy (e.g. van Nice & Dietrich, 2003; Verhoeven, 2014; Bader et al., 2017) and when it is manipulated in terms of discourse status, including givenness and topicality (e.g., Skopeteas & Fanselow, 2009; Bader et al., 2017). When the highly accessible referent is the object argument, it is brought to the prefield by producing a subject-initial passive sentence as in English. Although German is considered to be a language with relatively free word order, and sentences with OS order are a hallmark of free word order, experimental participants rarely make use of this option. Skopeteas & Fanselow (2009) have therefore hypothesized that givenness alone is not sufficient to move the object into the prefield position. Instead, Skopeteas & Fanselow claim that more specific discourse relations are necessary for this purpose, as discussed in the next section.

Despite the repeated finding that participants in language production experiments refrain from using sentences with OS order, it is not difficult to find authentic OS sentences in which the referent of the fronted object NP is related to the prior context by a simple relation of givenness. An example that we recently found in the news is shown in (2).

(2) *US-Musikerin Alexa Ray Joel beginnt das neue Jahr mit einem neuen Accessoire*
US musician Alexa Ray Joel starts the new year with a new accessory
– einem Verlobungsring. Den hat sie von ihrem Freund Ryan Gleason
– an engagement ring. DEM.ACC has she from her boyfriend Ryan Gleason
bekommen.
got

‘US musician Alexa Ray Joel starts the new year with a new accessory – an engagement ring. She got it from her boyfriend Ryan Gleason.’

(http://www.fr.de/panorama/leute/promi-news-billy-joels-tochter-hat-sich-verlobt-a-1418012; last accessed 2018/6/27)

The object in (2) is a demonstrative pronoun that has been termed ‘d-pronoun’ in the linguistic literature in order to distinguish it from the more formal demonstrative pronoun *dieser*. In accordance with the literature, we will refer to the latter as ‘demonstrative pronoun’. D-pronouns have received a fair amount of attention (e.g., Abraham, 2002; Bosch et al., 2007; Hinterwimmer, 2014; Portele & Bader, 2016). Concentrating on d-pronouns acting as subjects, one finding of this research is that d-pronouns preferentially occur in the prefield (Bosch et al., 2003).

Preliminary corpus evidence shown in Table 1 indicates that this also holds for d-pronouns acting as objects. The data shown in Table 1 are from ongoing corpus studies (see Bader et al., 2017, and Bader & Koukoulioti, 2018, for preliminary reports) analyzing the deWac corpus

Table 1. Percentages of SO and OS sentences and number of corpus hits according to type of object NP

	deWac corpus	Wikipedia texts			
Order	D-pronoun (n=500)	Demonstrative full NP (n=409)	Demonstrative pronoun (n=145)	Definite full NP (n=4701)	Personal pronoun (n=187)
% SO	4	24	24	82	98
% OS	96	76	76	18	2

(Baroni et al., 2009) and the German version of Wikipedia. When the object is a d-pronoun, OS order is highly preferred. When the object is a demonstrative pronoun or NP, OS order is still favored, although not as strongly. For definite NP objects, in contrast, SO order is preferred, and for personal pronoun objects, OS order is extremely rarely found. These corpus data show that in authentic texts the choice of word order is strongly dependent on the referential form of the object NP.

In this paper, we present two acceptability experiments that continue this line of research. Both experiments investigate whether the acceptability of sentences with SO or OS order depends on the referential form of the object NP. Experiment 1 compares the two most extreme cases to each other – d-pronoun objects and personal pronoun objects. Experiment 2 compares d-pronoun objects to objects realized as demonstrative NPs. Demonstrative NPs also show a preference for OS order, but in a much less extreme way than d-pronouns. By looking at these three referential forms – d-pronouns, demonstrative NPs and personal pronouns – our experiments take into account the whole range of preferences seen in Table 1.[2]

The organization of this paper is as follows. In Section 2, we give a short overview of research on non-canonical word order, in particular with regard to the discourse properties licensing different types of non-canonical order. Sections 3 and 4 present the two experiments that have tested the interplay of word order and referential form. The paper ends with a general discussion in Section 5.

2 Discourse relations licensing non-canonical word order

As discussed in the introduction, experiments investigating sentence production in German have found that participants mainly use passivization in order to bring an object argument into the clause-initial position when lexical-conceptual or discourse-pragmatic factors favor this order. As pointed out by Skopeteas & Fanselow (2009), German-speaking participants behave like English-speaking participants in this regard. We therefore start with a short look at sentences with non-canonical word-order in English, mainly drawing on the work of Birner & Ward (e.g., Birner & Ward, 1998; Birner, 2003; Birner & Ward, 2009). Birner & Ward's analysis of non-canonical word-order in English is rooted in the widespread view that speakers prefer to produce sentences in which old information precedes new information. As for the definition of old and new information, Birner and Ward build on Prince's (1981) insight that the old-new distinction has several dimensions, including a discourse dimension – information can be old or new with respect to the unfolding discourse – and a hearer dimension – information can be old or new with respect to the hearer. For Prince, these two dimensions could not vary independently because she excluded that information can be discourse-old but hearer-new. Birner & Ward, in contrast, as-

[2]Demonstrative NPs and demonstrative pronouns show the same pattern in the corpus data. We selected demonstrative NPs for Experiment 2 for no particular reason. We are currently running an experiment investigating the complete set of referential expressions shown in Table 1.

sume that the two dimensions can be freely combined, giving rise to the four discourse-relations in (3).

(3) Discourse status of phrases according to Birner & Ward (2009, 1169f.)

a. **textually evoked – hearer-old, discourse-old**: information that has been previously evoked, and is therefore assumed to be familiar both to the hearer and within the current discourse

b. **unused – hearer-old, discourse-new**: information that is assumed to be familiar to the hearer, but that has not previously been evoked in the current discourse

c. **brand-new – hearer-new, discourse-new**: information that has not been previously evoked in the current discourse, and that is, moreover, assumed to be unfamiliar to the hearer

d. **inferrable – hearer-new, discourse-old**: information that has been evoked in the current discourse, but that is nonetheless assumed to be unfamiliar to the hearer

The first three categories in (3) are illustrated in (4) (taken from Birner & Ward, 2009).

(4) Maria Shriver woke up Sunday morning and decided to surprise the audience at a rally for Senator Barack Obama in Los Angeles, materializing alongside Oprah Winfrey and telling the crowd she was there because she sought 'an America that's about unity.'
('Politics makes for estranged bedfellows', New York Times, 2008/2/4)

The referents of the various proper names in (4) (*Maria Shriver, Senator Barack Obama, Los Angeles, Oprah Winfrey*) are all discourse-new when they are introduced into the text, but since they can be assumed to be known to a typical reader of the New York Times, they are hearer-old. The referent of the pronoun *she* has been explicitly introduced at the beginning of the text, so it is both discourse-old and hearer-old. The referent of the NP *a rally* finally is brandnew – it has neither been mentioned before (discourse-new) nor can it be assumed to be already known by a typical reader (hearer-new).

The fourth category in (3) is *inferrable information*, that is, information that is discourse-old but still hearer-new. For Birner & Ward, information can be discourse-old but still hearer-new because for them, all information that can be inferred from a text counts as discourse-old. One type of information that can be inferred from a text is information that stands in a *poset* relation (Ward & Prince, 1991) to the prior context. A poset relation imposes a partial ordering on a given set of elements. An example of a poset relation is the set-subset relation, which licenses preposing in the following example (from Birner, 2003).

(5) I have a great deal of clothes....Most of my stuff, my mom gets at Alexander's.
(Philadelphia Inquirer, 1983/6/11)

The initial sentence in (5) introduces a set of clothes into the discourse. The second sentence contains an NP that refers to a subset of the set of clothes introduced before. This NP has been preposed, which is licit because the set-subset relation imposes a partial ordering. A further

example of a poset relation is the *part-whole relation* (e.g., a side mirror is a part of a car). As shown below, the part-whole relation also allows preposing.

Let us now consider Birner & Ward's analysis of non-canonical word-order in English. Of the different types of constructions with non-canonical word-order, preposing constructions are most relevant in the current context. An example of the so-called *topicalization* construction is given in (6) (taken from Birner, 2003).

(6) Tico Feo was eighteen years old and for two years had worked on a freighter in the Caribbean. As a child he'd gone to school with nuns, and he wore a gold crucifix around his neck. He had a rosary too. *The rosary he kept wrapped in a green silk scarf that also held three other treasures:* ('A Diamond Guitar', in Truman Capote, Breakfast at Tiffany's and Three Stories, Vintage Books 1993:144)

The preposed object NP *The rosary* in (6) is both discourse-old and hearer-old. According to Birner & Ward, the first property is necessary for preposing to be felicitous but the second is not. Thus, the information represented by the preposed phrase must be discourse-old but it can be either hearer-old or hearer-new – that is, it can be textually evoked or inferrable.

An additional constraint on preposing formulated by Birner & Ward is that preposing is only licit if a sentence expresses an open proposition that is salient in the current discourse, where an open proposition corresponds to the background of the focus-background articulation. In example (6), the sentence *The rosary he kept wrapped in a green silk scarf that also held three other treasures:* contains the open proposition *He kept Y at place X*. This proposition has been made salient in the preceding context by mentioning the place where he kept his gold crucifix. When the open proposition of a sentence is not salient, preposing is infelicitous, as in the following examples cited by Birner & Ward (2009).

(7) a. Ah, there's a knife. #With it, I'll cut the bread.

b. We have a new mail carrier. #To him, the dog runs every day.

c. This homeless person accosted me at the 7–11. #To the poor guy, I gave a dollar. (= Birner & Ward 1998:242f, examples (312a), (315b), (313a))

Turning now to word order in German, it has been repeatedly noted that OS order is particularly favored when the referent of the object stands in a poset relation to an element of the preceding discourse.[3] Experimental evidence for this point has been provided by Weskott et al. (2011), who had participants rate two-sentence discourses as shown in (8) and (9) on a scale ranging from 1 (unacceptable) to 7 (acceptable).

(8) Context: *Peter hat den Wagen gewaschen.*
Peter has the.ACC car washed
'Peter has washed the car.'

[3]OS order can also be licensed by lexical-semantic factors, e.g., using non-agentive verbs together with inanimate subjects and animate objects. In the following, we only consider the case where lexical-semantic factors favor the use of SO order. See Bader & Häussler (2010) and Verhoeven (2015) for further discussion and corpus evidence on this point.

a. SO: *Er hat den Außenspiegel ausgelassen.*
He.NOM has the.ACC side mirror left-out
'He left the side mirror out.'

b. OS: *Den Außenspiegel hat er ausgelassen.*
The.ACC side mirror has he.NOM left-out
'The side mirror, he left out.'

(9) Context: *Peter hat den Wagen gewaschen.*
Peter has the.ACC car washed
'Peter has washed the car.'

a. SO: *Er hat den Außenspiegel besonders gründlich gewienert.*
He.NOM has the.ACC side mirror particularly diligently polished
'He polished the side mirror with particular diligence.'

b. OS: *Den Außenspiegel hat er besonders gründlich gewienert.*
The.ACC side mirror has he.NOM particularly diligently polished
'The side mirror, he polished with particular diligence.'

(8) and (9) share the same context sentence, which introduces two referents. The referent of the subject NP serves as topic in the next sentence, being taken up by a subject pronoun. The referent of the object NP of the second sentence, on the other hand, stands in a poset relation to the referent of the object NP in the first sentence. (8) and (9) differ from each other in that the second sentence in (8) stands in an adversative relation to the context sentence whereas the second sentence in (9) is an elaboration of the first sentence.

The results found by Weskott et al. (2011) for short texts as in (8) and (9) are shown in Table 2 (additional results from a null-context condition are not shown). They found that OS sentences were judged as more acceptable and were read faster than SO sentences. In the terminology of the authors, this is a case of *strong licensing* of the OS order.

Table 2. Overall mean ratings (standard deviations) for sentences with a preceding context sentence in the study of Weskott et al. (2011)

	Nonadversative condition	Adversative condition
SVO	6.28 (1.41)	5.93 (1.59)
OVS	6.44 (1.12)	6.33 (1.18)

Evidence that a poset relation is a sufficient condition for OS licensing also comes from corpus studies (Filippova & Strube, 2007; Speyer, 2007, 2010). Based on his corpus results, Speyer (2010) proposes the three constraints in (10) for filling the prefield (German 'vorfeld').

(10) a. TOPIC-VF: The topic is moved to the vorfeld

b. CONTRAST-VF: The contrast element is moved to the vorfeld

c. SCENE-SETTING-VF: The scene-setting element is moved to the vorfeld

The constraints in (10) are to be understood as violable constraints in the sense of Optimality Theory (Prince & Smolensky, 2004). A contrast element, as mentioned in the constraint CONTRAST-VF, is an element that is related to the prior discourse by a poset relation. Scene-setting elements, as mentioned in the constraint SCENE-SETTING-VF, are mostly adverbials that anchor a sentence locally or temporally. The prefield constraints are ordered according to the prefield hierarchy in (11). When several phrases compete for filling the prefield, the one highest in the prefield hierarchy is selected and moved to the prefield.

(11) *Prefield-Hierarchy*: SCENE-SETTING-VF >> CONTRAST-VF >> TOPIC-VF

To see the prefield hierarchy at work, consider example (12), which is an excerpt from the Wikipedia article about the actor Martin Shaw.

(12) *Shaw studierte an der London Academy of Music and Dramatic Art.*
Shaw studied at the London Academy of Music and Dramatic Art
Nach seinem Abschluss *erhielt* ***er*** *schnell Rollen am Theater, darunter in*
After his examination got he quickly roles at theater, among-them in
Blick zurück im Zorn (…) *und* Endstation Sehnsucht (…).
Look Back in Anger and *A Streetcar Named Desire*

'Shaw studied at the London Academy of Music and Dramatic Art. After his examination he quickly got roles at the theater, among others in *Look Back in Anger* and *A Streetcar Named Desire.*'
(https://de.wikipedia.org/wiki/Martin_Shaw; last accessed 2018/11/29)

The first sentence establishes Shaw as an aboutness topic. In the following sentence, he is still the topic. This sentence also contains a scene-setting element, the temporal adverbial *Nach seinem Abschluss* ('After his examination'). This scene-setting element occupies the prefield position, and not the topic NP *er* ('he'), in accordance with the prefield hierarchy on which scene-setting elements are ranked higher than topics.

As pointed out in the introduction, it is not difficult to find authentic examples of sentences with OS order in which the object referent does not stand in a poset relation to some entity or set of the preceding discourse, but in which the object is merely given, that is, in which the referent of the object NP stands in an identity relation to a referent of the preceding referent. In Birner and Ward's classification of discourse relations, these are referents that are discourse- and hearer old (evoked referents in the terminology of Prince, 1981). When such a referent has been mentioned recently, the usual way to refer to it is by a personal pronoun (p-pronoun for short). In the case of an object NP, this gives rise to examples as in (13).

(13) Context: *Maria hat gestern einen ehemaligen Kollegen getroffen.*
Maria has yesterday a.ACC former colleague met
'Maria met a former colleague yesterday.'

a. SO continuation: *Sie hat ihn sofort wiedererkannt.*
she.NOM has him.ACC immediately recognized
'She recognized him immediately.'

b. OS continuation: *Ihn hat sie sofort wiedererkannt.*
him.ACC has she.NOM immediately recognized
'Him, she recognized immediately.'

As in the prior examples (8/9), the subject of the first sentence in (13) is the topic which is taken up in the second sentence by a subject pronoun. In contrast to (8/9), the object of the first sentence is also taken up by a pronoun in the second sentence. As far as we can see, object pronouns as in (13) are not covered by the prefield hierarchy in (11). The referent of the pronoun *ihn* does not stand in a poset relation to a given referent, nor is it a sentence topic. The prefield hierarchy in (11) therefore does not make a prediction concerning the two possible orders in (13). Such a prediction is possible, however, by taking into account the referential form of the object NP in the second sentence of (13). Unstressed object pronouns in German are preferentially put at the beginning of the middlefield, into the so-called Wackernagel position, whereas they are fully acceptable in the prefield only under special conditions (Lenerz, 1992). Because unstressed subject pronouns are not constrained in the same way, we can expect that the preferred order in (13) has the subject in the prefield and the object at the left edge of the middlefield, as in the SO sentence (13a).

Using a p-pronoun is not the only way to express a non-topical referent that stands in an identity relation to a referent already given in the prior context. In addition to a lexical NP, demonstrative pronouns can be used for this purpose. German has two types of demonstrative pronouns, the regular demonstrative pronoun *dieser* ('this') and the so-called d-pronoun *der* (lit. 'the'), which is form-identical with the definite article in most of its paradigm. Because theoretical as well as experimental research has been mainly concerned with d-pronouns, we will concentrate on them, too. A consensus that has been reached in recent work is that d-pronouns are the preferred means for referring to a referent that is given in the preceding sentence but is not a topic. D-pronouns are thus highly relevant in the present context. Example (13) is repeated in (14) with the object realized as a d-pronoun.

(14) Context: *Maria hat gestern einen ehemaligen Kollegen getroffen.*
Maria has yesterday a.ACC former colleague met
'Maria met a former colleague yesterday.'

a. SO continuation: *Sie hat den sofort wiedererkannt.*
she.NOM has DEM.ACC immediately recognized
'She recognized him immediately.'

b. OS continuation: *Den hat sie sofort wiedererkannt.*
DEM.ACC has she.NOM immediately recognized
'Him, she recognized immediately.'

Because the preferred position of a d-pronoun is the prefield, we can expect that in the case of (14), the OS variant is at least as acceptable as the SO variant. Experiment 1 tests the predictions for sentences with either a p-pronoun or a d-pronoun object.

3 Experiment 1

Experiment 1 investigates the effect of referential form on the order of subject and object for two types of object NPs. As shown in (15), the object NP is either the p-pronoun *ihn* ('him') or

the d-pronoun *den* ('him-DEM').

(15) Context: *Ich habe gestern einen ehemaligen Kollegen getroffen.*
I have yesterday a.ACC former colleague met
'I met a former colleague yesterday.'

a. SO continuation: *Ich habe ihn/den sofort wiedererkannt.*
I.NOM have him/DEM.ACC colleague immediately
'I recognized him immediately.'

b. OS continuation: *Ihn/Den habe ich sofort wiedererkannt.*
him/DEM.ACC have I.NOM immediately recognized
'Him, I recognized immediately.'

In the first and the second sentence, the subject is the first-person pronoun *ich* ('I'). A first-person pronoun was used for this purpose because they are always available as sentence topics (Erteschik-Shir, 2006) and are therefore especially appropriate for use in a discourse-initial sentence. This is different from the experiment of Weskott et al. (2011), in which the subject of the first sentence was a proper name and the subject of the second sentence was the third-person pronoun *er* ('he'). Since the subject of the second sentence was a p-pronoun coreferent with the subject of the first sentence in both cases, it should not matter whether a first- or second-person pronoun is used. Possible consequences of having a p-pronoun as subject in the second sentence are discussed in the general discussion.

For sentences with a p-pronoun object, the syntactic literature discussed in the preceding section lets us expect that SO order is fully acceptable whereas OS order is of reduced acceptability. For sentences with a d-pronoun object, OS order should be at least as acceptable as SO order because d-pronouns preferentially occur in the prefield.

3.1 Method

3.1.1 Participants

25 students from the Goethe-University Frankfurt completed an online questionnaire for course credit. All participants were native speakers of German and naive with respect to the purpose of the experiment.

3.1.2 Materials

Sixteen experimental items were constructed for Experiment 1, with each item appearing in four versions according to the two factors *Referential Form* (p-pronoun versus d-pronoun) and *Word Order* (SO versus OS). A complete item is shown in Table 3. Each item consisted of two sentences. The first sentence always started with an adverbial phrase, followed by the finite verb, the subject, the object and the non-finite verb. The subject of all sentences was the first-person pronoun *ich* ('I'). The object was always an indefinite NP. The second sentence started either with the subject or the direct object. The remainder of the second sentence contained one finite and one or more non-finite verbs, the subject or direct object, as well as other object and/or adverbial phrases. As in the first sentence, the subject of the second sentence was the first-person pronoun *ich*. The direct object was either the third-person pronoun *ihn* ('him') or the demonstrative pronoun *den* ('him-DEM').

Table 3. Stimulus sentence from Experiment 1

Context sentence	*Heute morgen habe ich einen wichtigen Kunden angerufen.*	
	today morning have I a important client called	
	'This morning, I had to call an important client.'	
Target sentence		
P-pronoun	SO	*Ich musste ihn von unserem neuen Produkt überzeugen.*
		I must him of our new product convince
	OS	*Ihn musste ich von unserem neuen Produkt überzeugen.*
		him must I of our new product convince
		'I had to convince him of our new product.'
D-pronoun	SO	*Ich musste den von unserem neuen Produkt überzeugen.*
		I must him of our new product convince
	OS	*Den musste ich von unserem neuen Produkt überzeugen.*
		him must I of our new product convince
		'I had to convince him of our new product.'

3.1.3 Procedure

Experiment 1 was run as a web experiment on Ibex Farm made available by Alex Drummond (http://spellout.net/ibexfarm/). Participants saw each item on a separate browser page with the numbers 1 to 7 displayed beneath the item. They were asked to judge the acceptability of the item by clicking on one of the numbers 1 to 7. A short instruction which appeared in the browser after starting the experiment told participants that 1 meant 'totally unacceptable' and 7 meant 'totally acceptable'. The instruction did not contain any example sentences. In order to ease the association between the numbers and their intended meaning, each trial included the label 'totally unacceptable' to the left of the 1–7 scale and the label 'totally acceptable' to the right. The experimental stimuli were combined with a set of 50 filler sentences and randomized individually for each participant. The presentation of the stimuli adhered to a Latin square design. Participants needed about 15–20 minutes to complete the questionnaire.

3.2 Results

All data presented in this paper were analyzed using the R statistics software, Version 3.3.2 (R Core Team, 2016). To test for significant effects, we analyzed the judgment data by means of linear mixed-effects modeling using the lme4 package (Bates, Mächler, Bolker & Walker, 2015). The R package lmerTest (Kuznetsova et al., 2017) was used for estimating degrees of freedom and p-values. We entered the experimental factors and all interactions between them as fixed effects into the model, using effect coding, that is, the intercept represents the unweighted grand mean and fixed effects compare factor levels to each other. In addition, we included random effects for items and subjects with maximal random slopes supported by the data, following the strategy proposed in Bates, Kliegl, Vasishth & Baayen (2015). Where necessary, simple contrasts were computed to compare mean values.

Figure 1 shows the mean acceptability values obtained in Experiment 1. The corresponding mixed-effects model is given in Table 4. The main effects of Referential Form and Word Order were not significant but the interaction between the two main factors was. This interaction reflects the finding that for sentences with a p-pronoun object, SO order resulted in higher acceptability than OS order (SO: 6.52 versus OS: 5.86), whereas the reverse was found for sen-

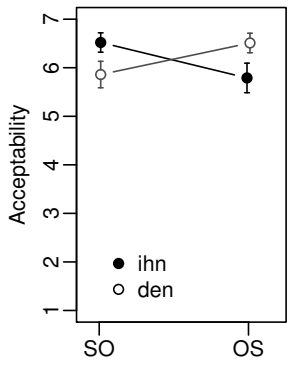

Figure 1. Mean acceptability in Experiment 1. Error bars show 95% confidence intervals

Table 4. Linear mixed model fitted by maximum likelihood estimation for Experiment 1

	Estimate	Std. Error	*df*	*t* value	Pr($>|t|$)
Intercept	6.17022	0.16811	31.1	36.704	
Referential Form	-0.04015	0.12667	11.7	-0.317	n.s.
Word Order	0.03480	0.12447	13.1	0.280	n.s.
Referential Form × Word Order	1.36623	0.28144	15.6	4.854	< 0.001

tences with a d-pronoun (SO: 5.79 versus OS: 6.51). An additional finding of Experiment 1 is that the preferred orders for the two pronouns (SO sentences with a p-pronoun object, OS sentences with a d-pronoun object) received almost identical ratings (SO/p-pronoun object: 6.52 versus OS/d-pronoun object: 6.51), and the same holds for the two non-preferred orders (OS/p-pronoun object: 5.86 versus SO sentences/d-pronoun object: 5.79).

3.3 Discussion

For p-pronoun objects, Experiment 1 yielded the expected preference for SO order. When the object was a d-pronoun, however, OS order was rated as more acceptable than SO order. Since referents of p-pronouns and d-pronouns are both discourse-old as well as hearer-old, this finding shows that the acceptability of a given order of subject and object depends not only on the discourse status of the subject and object referent, but also on the referential expression used for referring to them. The OS preference for objects realized as d-pronouns furthermore shows that givenness alone can suffice to license OS order, contrary to Skopeteas & Fanselow's (2009) claim that OS order must be licensed by a more specific discourse relation. We will discuss this issue in more detail after presenting Experiment 2 in order to base the upcoming discussion on a wider range of referential expressions.

Across all conditions, the acceptability of the sentences investigated in Experiment 1 was quite high. Thus, even the non-preferred variants still received acceptability values of about 5.8 on a 1–7 scale. The acceptability contrasts which we found in Experiment 1 are therefore unlikely contrasts between acceptable and unacceptable sentences. In fact, all sentences investigated in Experiment 1 can be considered acceptable, and the observed contrasts are fine-grained modulations of acceptability depending on word-order. In this regard, our results are not different from the results of Weskott et al. (2011). For OS sentences with a p-pronoun object in the prefield, this finding is somewhat surprising because object pronouns are often considered to be ungrammatical in the prefield unless they are narrowly focused and therefore stressed. Since there was no reason to narrowly focus the pronoun, our data indicate that unstressed object pronouns in

the prefield are not as unacceptable as sometimes suggested in the literature.

As pointed out above, there already exists a rich literature on d-pronouns in German which focuses almost exclusively on the interpretation of d-pronouns, in particular in comparison to p-pronouns (e.g., Bosch et al., 2007; Hinterwimmer & Bosch, 2016; Portele & Bader, 2016; Schumacher et al., 2016; Schumacher et al., 2017). This literature has typically considered d-pronouns that occur as a subject in clause-initial position. A major finding of both experimental investigations and corpus studies was that the typical antecedent of a d-pronoun has three properties – it is an object, occurs sentence finally and is not a topic. Neither of these properties is necessary, however. How the interpretation of d-pronouns connects to the findings yielded by Experiment 1 is an open question.

With regard to interpretation, it does not seem to matter whether the d-pronoun is a sentence-initial subject or a sentence-initial object. Thus, *Der* in (16a) and *Den* in (16b) both show a strong preference to take the sentence-final object of the preceding clause as an antecedent.

(16) Context: *Magnus würde gerne mit Fabiano Schach spielen.*
Magnus would gladly with Fabiano chess play
'Magnus would like to play chess with Fabiano.'

a. SO continuation: *Der hat aber momentan keine Zeit.*
DEM.NOM has but momentarily no time
'But he has no time currently.'

b. OS continuation: *Den plagen momentan aber gesundheitliche Probleme.*
DEM.ACC plague momentarily but health-related problems
'But health problems plague him currently.'

It thus seems that the preferred interpretation of a d-pronoun is independent of its syntactic function and its clausal position, at least in the core case of an antecedent that is a non-topical sentence-final object. Future research will show whether there are more subtle effects of syntactic function and word order on interpretation.

4 Experiment 2

Experiment 2 is similar to Experiment 1, the only difference being that it compares sentences with a d-pronoun object to sentences in which the object is a demonstrative NP. An example for a sentence with a demonstrative NP as object is shown in (17).

(17) Context: *Ich habe gestern einen ehemaligen Kollegen getroffen.*
I have yesterday a.ACC former colleague met
'I met a former colleague yesterday.'

a. SO continuation: *Ich habe diesen Kollegen sofort wiedererkannt.*
I.NOM have this.ACC colleague immediately recognized
'I recognized this colleague immediately.'

b. OS continuation: *Diesen Kollegen habe ich sofort wiedererkannt.*
this.ACC colleague have I.NOM immediately recognized
'This colleague, I recognized immediately.'

If the preference for the prefield shown by the d-pronoun applies to demonstrative phrases more generally, then sentences with a demonstrative NP as object should show a preference for OS order, too. On the other hand, given that the corpus data in Table 1 show a much weaker preference for OS order in the case of demonstrative NPs, a weaker OS preference or no preference at all is expected if corpus preferences and acceptability are in close correspondence.

4.1 Method

4.1.1 Participants

25 students from the Goethe-University Frankfurt completed a questionnaire for course credit. All participants were native speakers of German and naive with respect to the purpose of the experiment.

4.1.2 Materials

Table 5. Stimulus sentence from Experiment 2

Context sentence	*Heute morgen habe ich einen wichtigen Kunden angerufen.*	
	today morning have I a important client called	
	'This morning, I had to call an important client.'	
Target sentence		
D-pronoun	SO	*Ich musste den von unserem neuen Produkt überzeugen.*
		I must him of our new product convince
	OS	*Den musste ich von unserem neuen Produkt überzeugen.*
		him must I of our new product convince
		'I had to convince him of our new product.'
Demonstrative NP	SO	*Ich musste diesen Kunden von unserem neuen Produkt überzeugen.*
		I must this costumer of our new product convince
	OS	*Diesen Kunden musste ich von unserem neuen Produkt überzeugen.*
		this costumer must I of our new product convince
		'I had to convince this costumer of our new product.'

For Experiment 2, the sixteen sentences investigated in Experiment 1 were adapted as follows: First, the condition 'p-pronoun' of the factor Referential Form was replaced by the condition 'demonstrative NP'. In this condition, the object NP of the second sentence was a demonstrative NP consisting of the demonstrative determiner *diesen* ('this.ACC)' followed by the noun of the object NP in the first sentence. Second, one sentence of Experiment 1 contained an adverbial phrase including a demonstrative determiner. This adverbial was replaced by one without the demonstrative determiner in order to avoid a stylistically awkward word repetition. Four experimental lists were constructed from the experimental sentences according to a Latin square design.

4.1.3 Procedure

Experiment 2 was run in the form of a paper-and-pencil questionnaire. Four questionnaires were constructed on the basis of the four experimental lists. Each list was combined with a set of 56 filler sentences representing a wide variety of different structures. The experimental stimuli were randomized differently for each of the four questionnaires. Participants completed the questionnaires as part of a class session. They were asked to judge the acceptability of each item on the questionnaire by marking one of the numbers 1 to 7 printed beneath each sentence. A short instruction on the first page of the questionnaire told participants that 1 meant 'totally unaccept-

Table 6. Linear mixed model fitted by maximum likelihood estimation for Experiment 2

	Estimate	Std. Error	*df*	*t* value	Pr($>|t|$)
Intercept	5.6561	0.2187	31.78	25.863	
Referential Form	-0.7703	0.2212	21.55	-3.482	< 0.01
Word Order	0.5066	0.1704	13.15	2.973	< 0.05
Referential Form × Word Order	1.1456	0.3381	13.20	3.389	< 0.01

able' and 7 meant 'totally acceptable'. The instruction did not contain any example sentences. Participants needed about 15–20 minutes to complete the questionnaire.

4.2 Results

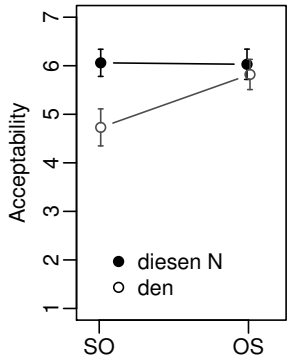

Figure 2. Mean acceptability in Experiment 2. Error bars show 95% confidence intervals

Figure 2 shows the mean acceptability values obtained in Experiment 2. The corresponding linear mixed-effects model is given in Table 6. The two main factors as well as the interaction between them were significant. The interaction reflects the finding that word order had no effect on sentences with a demonstrative NP as object – acceptability was high for both SO and OS sentences (6.1 versus 6.0). For sentences with a d-pronoun as object, in contrast, OS sentences were judged as more acceptable than SO sentences (5.8 versus 4.7). This replicates the finding from Experiment 1 for d-pronoun sentences. Furthermore, OS sentences with a demonstrative NP object and OS sentences with a d-pronoun object did not differ significantly from each other (6.0 versus 5.8).

4.3 Discussion

Experiment 2 has yielded two major findings. First, as in Experiment 1, with a d-pronoun object OS sentences were rated as more acceptable than SO sentences. Second, when the object was a demonstrative NP, there was no difference between SO and OS sentences – independently of order, acceptability was high. In addition to cases where either SO or OS order is preferred, we thus also found a case in which there seems to be no preference between the two.

Although the acceptability of sentences with a d-pronoun object was higher for OS order than for SO order, the acceptability of OS sentences with a d-pronoun object was not higher than the acceptability of either SO or OS sentences with a demonstrative NP as object. In other words, OS sentences were equally acceptable whether the object was a d-pronoun or a demonstrative NP. For SO sentences, in contrast, acceptability was higher in the case of demonstrative NP objects than in the case of d-pronoun objects. Thus, the advantage of OS to SO order in the case of d-pronoun objects is in fact a penalty for a d-pronoun object in the middlefield. This

conclusion is in accordance with the results of Experiment 1, the only difference being that Experiment 1 also found a penalty for OS sentences with a p-pronoun as object.

Although Experiment 2 revealed the same pattern for sentences with a d-pronoun as object – OS order is preferred to SO order – the absolute acceptability values are somewhat lower in Experiment 2 than in Experiment 1. The main difference between the two experiments was that Experiment 1 was run as a web-based experiment and participants could fill out the questionnaire at whatever time they wanted, whereas in Experiment 2 participants filled out a questionnaire printed on paper as part of a regular class session. We must leave it as a question for future research whether this procedural difference is responsible for the observed difference in absolute acceptability, or whether it is due to unknown differences between the two groups of participants.

5 General discussion

The two main findings of the experiments presented in this paper are that OS sentences containing an object that is merely given can be as acceptable as SO sentences, and that the acceptability of sentences with SO and OS order depends on the referential form of the object NP. For p-pronoun objects, SO order was rated as more acceptable than OS order; for objects realized as demonstrative NPs, both orders were judged as equally acceptable; and for d-pronoun objects, acceptability was higher for OS sentences than for SO sentences. From these findings, we can conclude that discourse status alone does not decide on how acceptable a sentence with the object in the prefield is. Thus, although mere givenness of an object referent sufficed for licensing OS order, how acceptable a particular sentence is does also depend on the referential form of its object NP (and likely on the referential form of the subject too; see below).

The results yielded by Experiments 1 and 2 correlate with the corpus data shown in Table 1. For referential expressions showing a strong corpus preference (p- and d-pronouns) for one order or the other, a corresponding acceptability difference showed up. When the corpus preference is less extreme, as in the case of demonstrative NPs, acceptability was high for both orders.

We refrain from integrating our results into Speyer's (2010) prefield hierarchy because too many questions are still open. Some of these questions are discussed in the next section. After that, we shortly compare English and German with regard to the discourse-licensing of non-canonical orders.

5.1 Putting objects into the prefield – open questions

We have shown that the referential form of an object NP affects the acceptability of OS sentences even for object NPs with identical discourse status. This factor has so far been neglected in the literature on canonical and non-canonical word order. For example, Speyer's (2010) prefield hierarchy in (11) is formulated exclusively in terms of discourse status, without taking referential form into account. A starting point for exploring this issue could be the various accessibility hierarchies that have been proposed in the literature (e.g., Gundel et al., 1993; Ariel, 2001).

A question not addressed in our experiments concerns the role of the subject NP for licensing OS order. In the second sentence of our experimental items, the subject NP was always the sentence topic realized in the form of a p-pronoun. The same is true for the experiments of Weskott et al. (2011). These two properties are relevant in the current context because the so-called Wackernagel Position (WP) at the left edge of the middlefield is the preferred position of p-pronouns (Lenerz, 1992) and, as has been argued by Rambow (1993), Frey (2004) and Filippova & Strube (2007), also of the sentence topic. In the sentences under consideration, the pronominal sentence topic was thus in its preferred position in sentences with OS order. This may have contributed to the finding that OS order was as acceptable or even more acceptable

than SO order although SO order is otherwise more acceptable and easier to process than OS order. Furthermore, it has also been shown that when the subject is a personal pronoun, OS order is preferred in relative clauses (Brandt et al., 2009; Bader & Koukoulioti, 2018).

For purposes of illustration, compare the example in (18) (repeated from above) to the example in (19), which differs from (18) in that the syntactic functions of the referents have been exchanged in the continuation sentences.

(18) Context: *Maria hat gestern einen ehemaligen Kollegen getroffen.*
Maria has yesterday a.ACC former colleague met
'Maria met a former colleague yesterday.'

a. OS continuation: p-pronoun + p-pronoun
Ihn hat sie sofort wiedererkannt.
him.ACC has she.NOM immediately recognized
'She recognized him immediately.'
b. OS continuation: p-pronoun + d-pronoun
Den hat sie sofort wiedererkannt.
DEM.ACC has she.NOM immediately recognized
'Him, she recognized immediately.'

(19) Context: *Peter hat gestern eine ehemalige Kollegin getroffen.*
Peter has yesterday a.ACC former colleague met
'Peter met a former colleague yesterday.'

a. OS continuation: p-pronoun + p-pronoun
Ihn hat sie sofort wiedererkannt.
him.ACC has she.NOM immediately recognized
'She recognized him immediately.'
b. OS continuation: p-pronoun + d-pronoun
Ihn hat die sofort wiedererkannt.
him.ACC has DEM.NOM immediately recognized
'Him, she recognized immediately.'

The sentences in (18) correspond to the OS sentences tested in Experiment 1. Overall, acceptability was relatively high, with a somewhat higher acceptability when the object was a d-pronoun than when it was a p-pronoun. In (18), the subject of the context sentence is also the subject of the continuation sentence; the object of the context sentence is accordingly the object of the continuation sentence. In example (19), the syntactic functions have been exchanged in the continuation sentences. The subject of the initial sentence is the object in the second sentence, and vice versa for the object of the context sentence. According to our intuitions, the OS sentences in (19) are substantially less acceptable than the OS sentences in (18). In case that these intuitions can be experimentally confirmed, this would show that the effects of discourse status and referential form have to be further qualified by the syntactic functions of the various referents. We must leave it as a task for future research to explore these issues experimentally and to formulate a satisfying theoretical account.

5.2 Non-canonical word order in English and German

As a final point, let us discuss how non-canonical word orders in English and German compare to each other. According to Birner & Ward (2009), there are two constraints on preposing in English. First, the preposed constituent must be discourse-old. With regard to the hearer, however, the preposed constituent is not constrained – it can either be hearer-old (evoked) or hearer-new (inferrable). As has been shown in the work of Speyer (2010) and Weskott et al. (2011), inferrable object referents (discourse-old, hearer-new) easily appear in the prefield position. The results presented here add to this evidence by showing that the same holds for evoked object referents (discourse- and hearer-old) if they are referred to by a demonstrative expression. We can thus conclude that moving an object NP to the prefield in German is no less constrained than preposing in English.

According to the second constraint on preposing proposed by Birner & Ward (2009) for English, a sentence must express a salient open proposition in order to allow preposing. This constraint is not valid for German. In (20), we give the German translations of the preposing sentences (7) that were cited by Birner & Ward (2009) to demonstrate that without a salient open proposition, preposing is ungrammatical in English. In contrast to their English counterparts, the sentences in (20) are all grammatical.

(20) a. *Ah, da ist ein Messer. Mit dem schneide ich das Brot.*
Ah there is a knife with DEM.DAT cut I the bread

b. *Wir haben einen neuen Postboten. Zu dem läuft der Hund jeden Tag.*
we have a new mail carrier to DEM.DAT runs the dog every day

c. *Dieser Obdachlose hat mich mehrfach angesprochen.*
this homeless person has me several times accosted
Dem armen Kerl habe ich einen Dollar gegeben.
the-DAT poor guy have I a dollar given

Comparing the infelicitous English examples (7) and the felicitous German examples (20) reveals an important difference between English and German preposing. Whereas the open proposition constraint in English gives preposing a contrastive flavor, OS sentences in German can be used without any sense of contrastiveness as long as the object referent stands in an appropriate relation to a referent of the preceding discourse (see also Molnár & Winkler, 2010).

This does not mean that it does not matter in German whether a sentence encodes a salient open proposition or not. When a sentence encodes a salient open proposition, German does not restrict object fronting in terms of Birner & Ward's discourse relations in the way English does. Thus, discourse new objects can be put into the prefield in question-answer pairs, as shown in (21) for both an unused (discourse-new, hearer-old) and a brandnew (discourse-new, hearer-new) object (see Fanselow et al., 2008, for experimental evidence).

(21) a. *Wen hat Peter auf der Konferenz getroffen? – Chomsky hat er dort getroffen.*
who has Peter on the conference met Chomsky has he there met
'Who did Peter meet at the conference? He met Chomsky there.'

b. *Wen hat Peter auf der Konferenz getroffen? – Einen berühmten Linguisten*
who has Peter on the conference met a famous linguist
hat er dort getroffen.
has he there met
'Who did Peter meet at the conference?. He met a famous linguist there.'

Without a salient open proposition, however, discourse-new objects, on our view, are much less felicitous when brought into the prefield. This is shown in (22).

(22) a.?? *Peter war letzte Woche auf einer Konferenz. Chomsky hat er dort getroffen.*
Peter was last week on a conference Chomsky has he there met
'Peter attended a conference last week. He met Chomsky there.'

b.?? *Peter war letzte Woche auf einer Konferenz. Einen berühmten Linguisten hat*
Peter was last week on a conference a famous linguist has
er dort getroffen.
he there met
'Peter attended a conference last week. He met a famous linguist there.'

Discourses of this type still have to be tested experimentally, so the judgments must be considered as tentative.

5.3 Conclusion

In conclusion, we propose that moving an object into the prefield in German is subject to the discourse constraint in (23).

(23) *Discourse constraint on object fronting in German*
Only objects referring to discourse-old referents can be put into the prefield except when a sentence expresses a salient open proposition. In that case, any object can be preposed.

Even if an object is given and thus licensed to move to the prefield, the resulting sentence may still not be fully acceptable. As shown by our experimental results, the acceptability of sentences with SO and OS order does not only depend on the discourse status of the NPs involved, but also on their referential form. OS sentences are somewhat less acceptable when the object is a personal pronoun whereas the acceptability of SO sentences is somewhat reduced when the object is a d-pronoun. To conclude, our results suggest that research on word order and research on referring expressions should no longer proceed in isolation from each other.

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