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DISCOURSE PROMINENCE IN TURKISH: THE INTERACTION OF GRAMMATICAL FUNCTION AND SEMANTIC ROLE

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1 Introduction*

The aim of this paper is to provide empirical evidence that not only grammatical function but also semantic role has an effect on discourse prominence in Turkish. We investigated the effects of these two parameters in constructions with psych verbs with an experiencer and a stimulus argument. We used subject-experiencer verbs as in (1) and object-experiencer verbs as in (2):

- (1) [Gökhan]_{Exp} dünkü kahvaltı daveti sonrasında [Naz-1]_{Stim}
Gökhan yesterday's breakfast invitation after Naz-ACC
[büyüleyici gül-üş-ün-den dolayı]_{Cause} gün boyunca **düşle-di.**
charming smile-NOM-3SG-ABL because of day long dream-PST.3SG
'After yesterday's breakfast invitation, Gökhan dreamed of Naz all the time because of her charming smile.'
- (i) *pro* sekiz-de mail at-tı.
 pro eight-LOC e-mail send-PST.3SG
- (ii) O sekiz-de mail at-tı.
 she/he eight-LOC e-mail send-PST.3SG
'She/He sent an e-mail at 8 p.m.'

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- (2) [Mete]_{Stim} [uyumsuz davranış-lar-ı-yla]_{Cause} [Seher-i]_{Exp}
 Mete rude behaviour-PL-3SG-with Seher-ACC
 geçen haftaki grup çalışmasın-da çok **kızdır-dı.**
 last week's group work-LOC very anger-PST.3SG
 'During last week's group work, Mete angered Seher through his rude behaviour.'
 (i) *pro* birden grup-tan ayrıl-dı.
 pro suddenly group-ABL leave-PST.3SG
 (ii) O birden grup-tan ayrıl-dı.
 she/he suddenly group-ABL leave-PST.3SG
 'She/He left suddenly the group.'

We measured discourse prominence by referential choice (likelihood of mention) and choice of referential expression (likelihood of pronominalization). Based on previous assumptions in the literature and our assumptions on discourse prominence, we tested the following four hypotheses in comprehension (H1 and H2) and production (H3 and H4):

- H1: Referential choice, measured by which referent is chosen as antecedent for a null vs. overt pronoun, depends on both grammatical function and semantic role.
 H2: Null vs. overt pronouns in Turkish behave differently; the null pronoun refers to the most prominent antecedent, the overt pronoun refers to a less prominent antecedent.
 H3: Referential choice, measured by which referent will be next-mentioned, depends on semantic role.
 H4: The form of the referring expression employed for the next-mentioned referent depends on grammatical function.

In our comprehension task, we found (i) that referential choice measured by antecedent selection depends on both grammatical function and semantic role. We found (ii) that there is no contrast between null vs. overt pronoun. In our production task, we found (iii) that referential choice depends on semantic role only, while (iv) the form of the anaphoric expression referring back to the object depends on grammatical function, while the form of the anaphoric expression referring back to the subject, depends on both grammatical function and semantic role.

2 Discourse prominence

Following Himmelmann & Primus (2015), we understand *prominence* to be a structure-building principle throughout the grammar of languages, and in particular for building discourse representations. We assume a characterization of prominence in discourse as a) relational, b) dynamic, and c) as an attractor of operations (see von Heusinger & Schumacher 2019).

In this study, we focus on the forward-looking function of referential expressions, or their potential to influence the referential choice. In comprehension, for example, this can be measured by finding the antecedent for an ambiguous anaphoric pronoun. Secondly, we focus on the backward-looking function of referential expressions, i.e. the inverse relation between the choice of an anaphoric expression and prominence in terms of accessibility of the antecedent. A long referential expression can access a less prominent or less accessible antecedent, while a very short referential expression can only access a very prominent antecedent (see Schumacher, Backhaus & Dangl 2015).

2.1 Discourse prominence and referential choice

Referential choice is typically measured according to whether a discourse referent is taken up anaphorically in subsequent discourse or not. Highly prominent discourse referents are more likely to be anaphorically rementioned in subsequent discourse than less prominent discourse referents. In addition, they are less likely to function as an antecedent for an anaphoric expression. Studies focusing on implicit causality have shown that participants expect pronouns to refer to the stimulus argument both in frighten-type verbs and fear-type verbs, rather than to the subject, as illustrated in (3) (based on Kehler & Rohde 2013: 20):

- (3) a. [Amanda]_{Exp} fears [Brittany]_{Stim} because she _____
 b. [Amanda]_{Stim} frightens [Brittany]_{Exp} because she _____

2.2 Discourse prominence and choice of referential expression

The choice of an appropriate referential expression depends on a different aspect of discourse prominence of the antecedent, namely on its accessibility or activation. Anaphoric expressions with reduced or no descriptive material indicate a high level of activation or accessibility of their antecedents, while more descriptive expressions indicate a low level of activation or accessibility. This inverse prominence relation is generalized in the Accessibility Hierarchy of Ariel (1990) or the Givenness Hierarchy of Gundel, Hedberg & Zacharski (1993). Because of their high level of activation, highly prominent discourse referents are typically picked up with linguistically reduced expressions (e.g. *pro* in pro-drop languages, personal pronouns in non-pro-drop languages), whereas less prominent discourse referents are picked up with linguistically more explicit forms.

This can be nicely illustrated by the contrast between the personal pronoun *er* and the d-pronoun *der* in German (Bosch & Hinterwimmer 2016). The main observation is that the personal pronoun is referentially ambiguous in a discourse like (4), but shows a preference to be resolved towards the most prominent referent, which is the subject or the topic. The d-pronoun, on the other hand, shows a strong preference to be resolved to a less prominent referent, i.e. the non-subject or the non-topic. Testing sentences such as the one in (4), Schumacher, Dangel & Uzun (2016: 217) have shown for German that the personal pronoun typically refers to the first mentioned, subject antecedent *Der Feuerwehrmann*, whereas the d-pronoun refers to the second mentioned, object antecedent *den Jungen*.

- (4) Der Feuerwehrmann will den Jungen retten.
 The fire-fighter wants the boy.ACC to rescue
 ‘The fire fighter wants to rescue the boy.’
- (i) Aber **er** ist zu aufgeregt. er = Der Feuerwehrmann
 But he is too nervous
 ‘But he is too nervous.’
- (ii) Aber **der** ist zu aufgeregt. der = den Jungen
 But he is too nervous
 ‘But he is too nervous.’

3 Turkish: referential choice vs. choice of referential expression

Turkish is a pro-drop-language. That is, pronouns are optional in subject position of clauses, as in (5a-b), and as possessors of possessive noun phrases, as in (6a-b), since the agreement morphemes on predicates and head nouns make it possible to recover the features of the omitted pronoun. The third person singular pronoun in Turkish does not encode gender. Furthermore, it has the same form as the distal demonstrative pronoun (Kornfilt 1997: 265-304).

- (5) a. Ben ev-e gel-di-m. b. *pro* ev-e gel-di-m.
 I house-DAT come-PST-1SG *pro* house-DAT come-PST-1SG
 ‘I came home.’ ‘I came home.’
- (6) a. Ben-im ev-im. b. *pro* ev-im.
 I-GEN house-1SG *pro* house-1SG
 ‘my house.’ ‘my house.’

Analyses on null vs. overt pronouns in Turkish are based on structural properties of the language (Enç 1986; Erguvanlı-Taylan 1986; Özsoy 1987) or based on data from novels (Kerslake 1987; Turan 1995; 1998). Other analyses focus either on child language or sign language.

In the literature, it has been argued that the use of null vs. overt pronouns in Turkish is conditioned by information structure. Null pronouns are assumed to maintain an established topic, whereas overt pronouns are used to contribute to the information structure, such as contrast, focus and topic-shift (Enç 1986; Kornfilt 1997: 265-304; Öztürk 2001). There is broad consensus in the literature that sentences with pronominal subjects in Turkish are more marked than their counterparts with null subjects, in the sense that they convey some extra pragmatic information. Turan (1998) suggests that the form of the pronoun can disambiguate between two potential antecedents, as in (7):

- (7) Ali_j Murat-_{1k} davet et-ti.
 Ali Murat-ACC invite-PST.3SG
 ‘Ali invited Murat.’
- (i) *pro*_{j/*k} hemen market-e git-ti.
pro immediately market-DAT go-PST.3SG
 ‘He immediately went to the market.’
- (ii) O_{?j/k} hemen market-e git-ti.
 He immediately market-DAT go-PST.3SG
 ‘He immediately went to the market.’

In (7i), the null pronoun refers to the subject referent *Ali* and cannot refer to the object referent *Murati*, as the subject antecedent is clearly preferred over the non-subject antecedent. The overt pronoun *o* in (7ii) shows a strong preference towards the less accessible non-subject antecedent *Murati*, but can still also be resolved towards the subject antecedent. Contexts with transitive verbs, as in (7), and general constraints on parallel structure suggest that grammatical function determines the type of anaphoric expression: The subject is more prominent and accessible and therefore licenses the null pronoun, while the non-subject is less prominent and less accessible and therefore can only license an overt pronoun (see Turan 1998). While this view makes correct predictions for sentences like (7), it ignores a potential confound, namely whether referential

form depends on grammatical function (subject > object), on semantic role (agent > patient), or on both, since both are aligned in sentences like (7), as is shown in (8).

(8)	Ali		Murat'ı		davet etti.
	Ref1	>	Ref2		
	Subject	>	Object		grammatical function
	Agent	>	Patient		semantic role

4 Experiment 1

To disentangle the effects of grammatical function and semantic role, we created an 2x2 experimental design with psych verbs mapping the experiencer argument and the stimulus argument to different syntactic positions.¹ In the subject-experiencer condition, the experiencer argument is in subject position (cf. 9). In the object-experiencer condition, the experiencer argument is in object position (cf. 10).

Subject-Experiencer condition

- (9) [Gökhan]_{Exp} dünkü kahvaltı daveti sonrasında [Naz'ı]_{Stim} [büyüleyici gülüşünden dolayı]_{Cause} gün boyunca **düşledi**.
 'After yesterday's breakfast invitation, Gökhan dreamed of Naz all the time because of her charming smile.'
 (i) *pro* sekizde mail attı.
 (ii) O sekizde mail attı.
 'She/He sent an e-mail at 8 p.m.'

[Gökhan]...		[Naz'ı]...	düşledi.
Ref1	>	Ref2	
Subject	>	Object	
Experiencer	>	Stimulus	

Object-Experiencer condition

- (10) [Mete]_{Stim} [uyumsuz davranışlarıyla]_{Cause} [Seher'i]_{Exp} geçen haftaki grup çalışmasında çok **kızdırdı**.
 'During last week's group work, Mete angered Seher through his rude behaviour.'
 (i) *pro* birden gruptan ayrıldı.
 (ii) O birden gruptan ayrıldı.
 'She/He left suddenly the group.'

[Mete]...		[Seher'i]...	kızdırdı.
Ref1	>	Ref2	
Subject	>	Object	
Stimulus	<	Experiencer	

¹ Psych verbs are cross-linguistically unique in that they are able to link the same arguments to different syntactic positions (see Belletti & Rizzi 1988, among others).

Psych verbs are characterized by the particular property of triggering explanations focusing systematically on one of the two arguments (see Garvey & Caramazza 1974, among others). To control for this particular property (also *Implicit Causality* or *IC*) and the next-mention bias associated with psych verbs, we added causal adjuncts establishing the reason for the psychological state, as *büyüleyici gülüşünden dolayı* ('because of her charming smile') in (9) (see Hoek 2018; Kehler & Rohde 2019; Solstad & Bott 2014).

For the thematic role scale, we adopted the idea of generalized semantic roles by Dowty (1991) and Primus (1999; 2006) and assume that the experiencer has more proto-agent features than the stimulus and is therefore more prominent. Both types of sentences were continued with a simple transitive sentence with an ambiguous subject realized as null pronoun *pro* as (9i/10i) or an overt pronoun *o* as in (9ii/10ii). In subject-experiencer verbs, the grammatical function scale and the semantic role scale are aligned, so that the experiencer subject is the most prominent argument. In object-experiencer verbs, the scales are not aligned, which is why this is the crucial test item for the strength of these two scales towards establishing prominence.²

4.1 Hypotheses

Discourse prominence was measured by examining (i) the interpretation preferences for the subject referent in the continuation sentence (being realized as *pro* or as overt pronoun *o*). We hypothesized that both grammatical function and semantic role determine referential choice in Turkish (cf. H1). Specifically, we predicted the subject of subject-experiencer verbs to be taken up more often than subjects of object-experiencer verbs, as the former has the prominence-lending properties of being subject and being experiencer whereas the latter has only the prominence-lending property of being subject. Furthermore, we tested (ii) the accessibility of the two arguments in the first sentence. Here, the literature (see Turan 1998 and discussion above) predicts that null pronouns refer exclusively to the subject and overt pronouns have a strong preference towards the object (cf. H2).

4.2 Design and methods

In Experiment 1, we manipulated verb type (subject-experiencer verb/fear-type verb vs. object-experiencer verb/frighten-type verb) and pronoun type (*pro* vs. overt pronoun *o* 'she/he'). We constructed a total of 16 critical items (8 subject-experiencer verbs, 8 object-experiencer verbs) and 20 filler items (10 source-goal verbs, 10 goal-source verbs). Critical items consisted of a context sentence containing a psych verb, i.e. subject-experiencer verb or object-experiencer verb and a target sentence containing an ambiguous subject pronoun, i.e. *pro* or the overt pronoun *o* (cf. 9 and 10). The context sentence (with SOV order) introduced two human referents using proper names (4 female-female, 4 male-male, 4 female-male, 4 male-female). In order to create a natural discourse context, we added local and temporal adjuncts. To control for implicit causality, we added causal adjuncts establishing the reason for the psychological state. Filler items contained verbs of transfer and the subject pronoun, i.e. *pro* or the overt pronoun *o*, was resolved to the goal referent through world knowledge (cf. (11) and (12)).

² See for discussion of agentivity and word order García García, Primus & Himmelmann (2018) and Riesberg, Malcher & Himmelmann (2019).

Source-Goal condition (filler)

- (11) [Sumru]_{Source} bu sabah ders-te [Oylum-a]_{Goal}
 Sumru this morning class-LOC Oylum-DAT
 [kalem kutu-sun-u kaybet-tiğ-i için]_{Cause} kalem ödünç ver-di.
 pencil case-3SG-ACC loose-NOM-3SG because pencil lend-PST.3SG
 ‘Sumru lent Oylum a pencil in the class this morning because she lost her pencil case.’
 (i) *pro* ders bit-ince teşekkür et-ti.
pro class end-ADV thank-PST.3SG
 ‘She thanked her when the class was over.’

Goal-Source condition (filler)

- (12) [Gürkan]_{Goal} [taşın-aca-ğ-ı için]_{Cause} dün
 Gürkan move away-FUT-NOM-3SG because yesterday
 emlak şubesi-de [Zeynep-ten]_{Source} anahtar-lar-ı teslim al-dı.
 estate agency-LOC Zeynep-ABL key-PL-ACC receive-PST.3SG
 ‘Because Gürkan is going to move away, he received from Zeynep yesterday the keys at the estate agency.’
 (i) O hızlıca yeni ev-e git-ti.
 he quickly new house-DAT go-PST.3SG
 ‘He quickly went to the new house.’

Critical items and filler items were distributed over two lists such that each critical item was in one condition in each list and each list contained the same filler items. Items were presented in pseudo-randomized order. 66 native speakers of Turkish were asked to read the sentences and to determine the subject of the target sentence by clicking on the corresponding proper name within a forced choice format. Participation took place via a web-based questionnaire. 6 participants were excluded from the analysis because the participant either participated in the pretest, sent the questionnaire twice, or sent the questionnaire after data collection. The final analysis included data from 60 participants.

4.3 Results

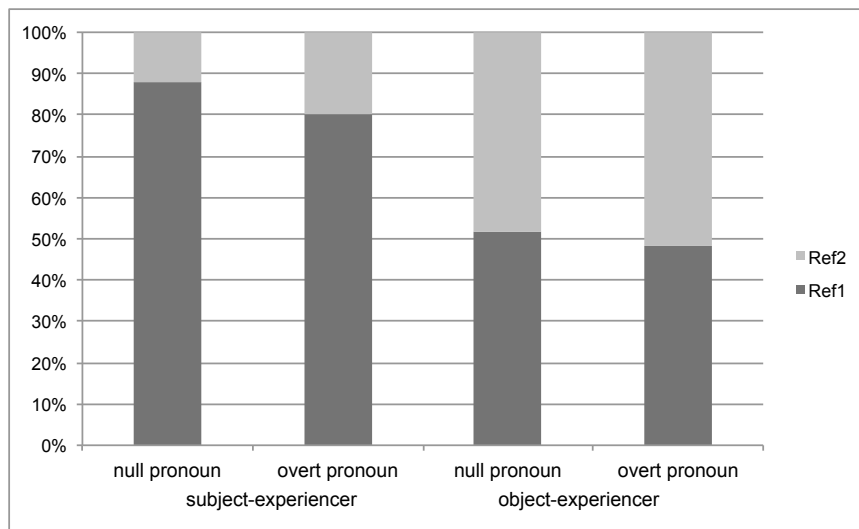


Figure 1. Proportion of subject (=Ref1) vs. object (=Ref2) interpretations of the pronoun per condition

Figure 1 shows the proportion of subject (=Ref1) vs. object (=Ref2) interpretations of the pronoun per condition. In the subject-experiencer condition, the subject referent was significantly more often chosen as antecedent than in the object-experiencer condition. There was no difference between *pro* and overt pronoun *o* in either the subject-experiencer condition or the object-experiencer condition.³

These results show that semantic role (together with grammatical function) determines referential choice in Turkish (cf. H1). However, the data are not in line with the hypothesis that there is a difference between *pro* and overt pronoun *o* with respect to their choice of a more or less prominent antecedent (cf. H2).

5 Experiment 2

5.1 Hypotheses

Experiment 2 tested production and used a sentence continuation task. We used the same experimental items as in Experiment 1 but without the continuation sentence (i.e., i-ii in (9-10)). Discourse prominence was measured by examining (i) which referent will be next-mentioned in subsequent discourse. We hypothesized that referential choice depends on semantic role (cf. H3). Therefore, we expected more subject next-mentions in the subject-experiencer condition and more object next-mentions in the object-experiencer condition. Secondly, we examined (ii) the choice of referential expression used to refer to the next-mentioned referent (i.e. the first referent in the produced sentence). We hypothesized that the choice of referential expression depends on grammatical function (cf. H4). We thus expected more subjects to be picked up with *pro* and we expected more objects to be picked up with overt forms.

5.2 Design and methods

The 36 items, consisting of 16 critical items (8 subject-experiencer verbs, 8 object-experiencer verbs) and 20 filler items (10 source-goal verbs, 10 goal-source verbs) from Experiment 1 were distributed over 6 lists, leaving out the continuation sentence (i.e., i-ii in (9-10)). 106 native speakers of Turkish were asked to read the sentences and to write one continuation sentence. Participation took place via a paper-pencil questionnaire. 16 participants were excluded from the analysis because the participant either indicated another country other than Turkey as his/her country of birth, the questionnaire was not completed, or the participant submitted the questionnaire after data collection. The final analysis included data from 90 participants.

³ Statistical analyses were conducted in R version 1.0.136 using the lme4 package (Bates et al., 2015) to perform generalized linear mixed-effect models (GLMM) with the referential choice as outcome variable. As fixed effects, we entered verb type and pronoun type into the model. As random effects, we had intercepts for subjects and items, as well as by-subject and by-item random slopes for the effects of verb type and pronoun type. The reduced model with two main effects was chosen on the basis of likelihood ratio test ($\chi^2(9) = 0.38, p > 0.05$). The results showed a significant main effect of verb type, $\beta = -2.20, SE = 0.54, z = -4.1, p = 0.001$, but no main effect of pronoun type, $\beta = -0.47, SE = 0.51, z = -0.93, p = 0.355$.

5.3 Data coding

We annotated each occurrence of an anaphorically used expression for Ref1 and Ref2 for critical test items. We annotated their position (Ref1, Ref1 > Ref2, Ref2, Ref2 > Ref1), their DP type (*pro*, pronoun, proper name, Def NP, Dem NP) and their grammatical function (subject, direct object, indirect object, possessor, other).

The following example shows a sample context sentence and two sample continuation sentences. (13i) is an example for *Ref1*, as only Ref1 (subject) is rementioned in the continuation sentence. Ref1 is picked up with *pro* and functions as the subject of the continuation sentence. (13ii) is an example for *Ref2 > Ref1*, as Ref2 (stimulus object of the antecedent sentence) precedes Ref1 (experiencer subject of the antecedent sentence) in the continuation sentence. Ref2 is picked up with a proper name and functions as the subject, whereas Ref1 is picked up with an overt pronoun and functions as the direct object.

- (13) [Gökhan]_{Ref1} dünkü kahvaltı daveti sonrasında [Naz'ı]_{Ref2} büyüleyici gülüşünden dolayı gün boyunca düşledi.
‘After yesterday’s breakfast invitation, Gökhan dreamed of Naz all the time because of her charming smile.’
- (i) *pro*_{Ref1} Güzel gül-en kız-lar-dan her zaman etkilen-ir-di.
pro beautiful smile-SBJP girl-PL-ABL every time be attracted-AOR-PST.3SG
[Ref1; Ref1 = *pro*; Ref1 = subject]
‘He was always attracted to beautiful smiling girls.’
- (ii) Oysa Naz_{Ref2} on-u_{Ref1} hiç umursa-ma-mış-tı.
however Naz he-ACC never care about-NEG-PPART-PST.3SG
[Ref2 > Ref1; Ref1 = pronoun; Ref1 = direct object;
Ref2 = proper name, Ref2 = subject]
‘However Naz didn’t care about him at all.’

Of the 1440 total continuation sentences, we excluded those that did not mention Ref1 or Ref2 (7%), that mentioned Ref1 and Ref2 conjoined with plural (9%), that contained direct speech (1%), and those that contained mistakes (1%), leaving 1180 continuation sentences for analysis.

5.4 Results

Table 1 shows the percentages and absolute numbers for the next-mentioned referent per condition.⁴

Table 1. Results of next mention in continuation sentence per condition

	Ref1 (= subject)	Ref2 (= object)	Total
Subject-Experiencer (SE)	67% (408)	33% (203)	100% (611)
Object-Experiencer (OE)	25% (142)	75% (427)	100% (569)

⁴ The table provides percentages and numbers of rementions of Ref1 (= subject) and Ref2 (= object) in the first position of the produced sentence, i.e. generally the subject of the continuation sentence. All instances falling under the annotation category Ref1 and Ref1>Ref2 are summarized as Ref1, and all instances falling under the annotation category Ref2 and Ref2>Ref1 are summarized as Ref2.

In the subject-experiencer condition, the subject referent was significantly more likely to be next-mentioned in a continuation sentence than the object referent. In the object-experiencer condition, the inverse pattern was observed in that the object referent was significantly more likely to be next-mentioned in a continuation sentence than the subject referent.⁵ Overall, these results suggest that which referent will be next-mentioned in subsequent discourse mainly depends on semantic role (cf. H3).

Table 2. Choice of referring expression for the next-mentioned referent

		Proper name	Null pronoun	Overt pronoun	DefNP	DemNP	Total
Ref1 (= subj)	SE	12% (48)	86% (352)	2% (8)	-	-	100% (408)
	OE	40% (57)	49% (70)	7% (10)	2% (3)	1% (2)	100% (142)
Ref2 (= obj)	SE	88% (178)	9% (18)	2% (4)	0% (1)	1% (2)	100% (203)
	OE	89% (380)	10% (43)	1% (4)	-	-	100% (427)

Table 2 shows the percentages and absolute numbers for the choice of referring expression employed for the next-mentioned referent. The results show that participants barely made use of overt pronouns, Def NP and Dem NP. Participants tended to use either a null pronoun or a proper name. Secondly, the table shows that Ref1, i.e. the subject of the antecedent sentence, is taken up with *pro* by nearly 90% in the subject-experiencer condition, and about 50% in the object-experiencer condition. Interestingly, there is no such contrast for Ref2, i.e. the object of the antecedent sentence. Ref2 is taken up by a proper name in 90% of the continuations in both conditions.

The data are thus only partly in line with the idea that the form of the referring expression used for the next-mentioned referent depends on grammatical function (cf. H4). The data suggest that the form of the next-mentioned referent for the object depends on grammatical function, while the form of the next-mentioned referent for the subject, depends on both grammatical function and semantic role.

Overall, this experiment thus suggests that referential choice (likelihood of mention) in Turkish is mainly determined by semantic role, while the choice of referential expression (likelihood of pronominalization) is determined for Ref2 (object) by grammatical function and for Ref1 (subject) by both grammatical function and semantic role.

6 Conclusions

The aim of this paper was to provide empirical evidence that not only grammatical function, but also semantic role has an effect on discourse prominence in Turkish. We reported an antecedent selection task (Experiment 1) and a sentence continuation task (Experiment 2).

In Experiment 1, we showed (i) that referential choice measured by antecedent selection depends on both grammatical function and semantic role. In addition, we showed (ii) that there is no

⁵ Statistical analyses were conducted in R version 1.0.136 using the lme4 package (Bates et al., 2015) to perform generalized linear mixed-effect models (GLMM) with the referential choice as outcome variable. The model included only verb type as a fixed effect. The random effects comprised subjects and items as random intercepts, as well as by-subject and by-item random slopes for the effect of verb type. The results showed a significant main effect of verb type, $\beta = -2.11$, $SE = 0.27$, $z = -7.85$, $p = 0.001$.

contrast between null vs. overt pronoun. In Experiment 2, we showed (iii) that referential choice measured by which referent will be next-mentioned depends on semantic role only, while (iv) the form of the anaphoric expression referring back to the object depends on grammatical function, while the form of the anaphoric expression referring back to the subject, depends on both grammatical function and semantic role.

In sum, these results suggest that discourse prominence in Turkish depends not only on grammatical function, but also on semantic role.

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