

Implicit causality biases in Turkish psychological state events

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How we identify the antecedent of an ambiguous pronoun has been a topic of interest in discourse anaphora studies. Crudely speaking, the most prominent entity is selected as the antecedent. Features such as topicality,^[1] givenness,^[2,3] focushood,^[3,4,5] parallel roles,^[6,7] recency,^[3] syntactic role,^[8] thematic role,^[9,10,11] verb type,^[10] coherence relations,^[13,14,15] verb valence (i.e., whether the verb has positive or negative meaning; connotation),^[16,17,18] and anaphoric expression^[3,19] have been nominated as possible determinants of prominence. However, how these factors interact is still an open question. For psychological state events (e.g., stimulus-experiencer, e.g., frighten; experiencer-stimulus, e.g., fear), the causal referents are likely to be re-mentioned in the upcoming discourse, and this leads to greater subject bias in verbs like *frighten* whereas greater object bias in verbs like *fear*. This bias, however, is not an absolute constraint on the interpretation of the pronoun^[20]. For Turkish, the intuition is that null pronouns are likely to refer to the subject and overt pronouns refer to the object^[21]. However, recent experimental studies show some verb types (e.g., action verbs) in Turkish may not reflect this expectation due to their strong thematic biases^[22]. In fact, stimulus-experiencer verbs are strongly biased towards the stimulus regardless of the anaphoric expression whereas experiencer-stimulus verbs are more malleable^[23]. In this study, we aim to replicate and extend a previous study^[23] by also manipulating several other factors to see how they interact.

We test how an ambiguous pronoun is interpreted in Turkish psychological state events (e.g., fear, frighten), and how verb valence (negative/positive) (manipulated within-subjects), anaphoric expression (null/overt), and word order (SOV/OSV) (manipulated between-subjects) influence interpretation. In a rating study, we asked Turkish participants (N=136) to determine the reference for a nonsense adjective in an utterance connected by a causal connector ‘because’ (Table 1). For the analyses, we used mixed-effect logistic regression with partially Bayesian regression, and we included random intercepts by participant and item, and random slopes of verb type by participant and word order by item. The results showed that there was greater stimulus bias in frighten-type verbs than in fear-type verbs ($\beta=1.25$, $z=7.04$, $p<.001$) (Figure 1). There was a trend for the effect of word order ($\beta=0.41$, $z=1.84$, $p=.06$), such that there was greater stimulus bias in OSV order than in SOV. This might be due to the combined effect of subjecthood and focushood. In fact, this trend was true only for fear-type verbs ($\beta=-0.63$, $z=-1.83$, $p=.06$) and only for overt pronouns ($\beta=0.69$, $z=1.80$, $p=.07$): The word order did not influence the stimulus bias in the frighten-type verbs as much as it did for fear-type verbs. Likewise, the word order did not influence the stimulus bias in the null pronoun condition as much as it did for overt pronouns. In other words, being in the focus position enhanced the subject’s prominence in fear-type verbs and in overt pronoun condition. We also found greater stimulus bias in the negative valence condition only for fear-type verbs ($\beta=-0.64$, $z=7.04$, $p<.05$) whereas for frighten-type verbs, valence did not change the stimulus bias. We conclude that Turkish psych-verbs attribute the cause to the entity in the stimulus role in frighten-type events; however, the semantics of fear-type verbs do not require a strong preference for causal attribution, which, in turn, makes fear-type verbs more malleable to external factors. We argue that this is because frighten-type verbs have more agentive properties, and they behave similarly to action verbs^[22]. Our findings highlight that pronoun resolution in Turkish is modulated by multiple factors such as word order, the type of anaphoric expression and the verb valence among others.

Table 1: Sample test items

(1)	a	SOV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Positive-valence verb					
		<i>Bahar</i>	<i>Ceren-i</i>	<i>arzu-luyor/büyül-üyor</i>	<i>çünkü</i>	<i>(o)</i>	<i>dakmuk.</i>
		Bahar-NOM	Ceren-ACC	desire/dazzle-PROG-3SG	because	(she)	dakmuk
		‘Bahar desires/dazzles Ceren because she is dakmuk.’					
b	SOV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Negative-valence verb						
	<i>Bahar</i>	<i>Ceren-i</i>	<i>kıskan-ıyor/üz-üyor</i>	<i>çünkü</i>	<i>(o)</i>	<i>dakmuk.</i>	
		Bahar-NOM	Ceren-ACC	envy/upset-PROG-3SG	because	(she)	dakmuk
		‘Bahar envies/upsets Ceren because she is dakmuk.’					
(2)	a	OSV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Positive-valence verb					
		<i>Bahar’ı</i>	<i>Ceren</i>	<i>arzu-luyor/büyül-üyor</i>	<i>çünkü</i>	<i>(o)</i>	<i>dakmuk.</i>
		Bahar-ACC	Ceren-NOM	desire/dazzle-PROG-3SG	because	(she)	dakmuk
		‘Ceren desires/dazzles Bahar because she is dakmuk.’					
b	OSV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Negative-valence verb						
	<i>Bahar’ı</i>	<i>Ceren</i>	<i>kıskan-ıyor/üz-üyor</i>	<i>çünkü</i>	<i>(o)</i>	<i>dakmuk.</i>	
		Bahar-ACC	Ceren-NOM	envy/upset-PROG-3SG	because	(she)	dakmuk
		‘Ceren envies/upsets Bahar because she is dakmuk.’					

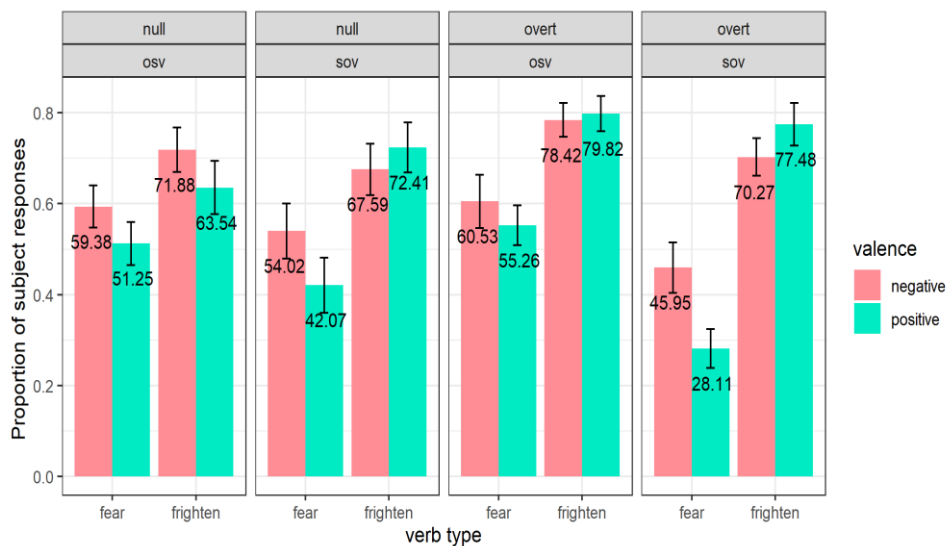


Figure 1: Subject preference in each word order, in each anaphoric type, in each verb type and valence. Error bars show the standard error of the mean.

References: [1] Givon (1983); [2] Gundel, Hedberg, and Zacharski (1993); [3] Arnold (1998); [4] Cowles, Walenski, and Kluender (2007); [5] Kaiser (2011), [6] Smyth (1994); [7] Chambers and Smyth (1998); [8] Crawley, Stevenson, and Kleinman (1990); [9] Stevenson, et al. (1994); [10] Garvey and Caramazza (1974); [11] Arnold (2001); [12] Grosz, Joshi, and Weinstein (1995); [13] Hobbs (1979); [14] Kehler (2008); [15] Rohde, Kehler, and Elman (2006); [16] Rudolph and Försterling (1997); [17] Fiedler and Semin (1988); [18] Franco and Arcuri (1990); [19] Fedele and Kaiser (2015); [20] Hartshorne and Snedeker, 2013; [21] Turan, 1997; [22] Özge and Evcen, 2020; [23] Özge, Harsthorne and Snedeker, 2016.