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IS THERE A BIAS IN PROCESSING DISCOURSE RELATIONS? A CONTRASTIVE EXPERIMENTAL STUDY

Söylem İlişkilerinin İşletiminde Önyargı Var Mıdır? Karşılaştırmalı Deneysel Bir Çalışma

Kübra ÖRSDEMİR[1]

Abstract

Previous research claims that humans have cognitive bias when they process texts or utterances incrementally. They suggest that humans more easily infer causal and continuous relations rather than concessive or discontinuous discourse relations. This contrastive experimental study aims to further investigate this issue by comparing two different languages; English and Turkish. The 14 participants in this study were divided into two experimental groups. While one group was exposed to English-stimuli, the other experimental group was exposed to Turkish-stimuli. It was aimed for the participants to complete or continue the given discourse at the moment of reading. Through this procedure their active implicit processing was aimed to be measured. A pilot study was done prior to the treatment to validate the experimental items which was used in the study. The results of the study indicate that there was a higher preference towards causal or continuous connectives in processing upcoming discourse in both English and Turkish languages. It was also found that in relation to the Uniform Information Density Hypothesis, causal or continuous discourse connectives were expressed implicitly more frequently in comparison to concessive connectives in both English and Turkish languages.
Keywords: Causal, continuous, concessive, bias, Uniform Information Density Hypothesis

Özet

Geçmiş araştırmalar insanların bir metin ya da söylemi işletirken bilişsel önyargılarının olduğunu ileriye sürmüştür. Bu araştırmalar, insanların nedensel ya da devamlılık sağlayan söylem ilişkilerinin ödünleyici ya da devamlılık sağlamayan söylem ilişkilerine göre anlamlarının daha kolay çıkarılabildiklerini ileriye sürmüşlerdir. Bu karşılaştırmalı deneysel araştırma, İngilizce ve Türkçe dillerini kıyaslayarak bu hususu biraz daha araştırmayı amaçlamaktadır. Bu araştırmada yer alan 14 katılımcı iki gruba ayrılmıştır. Gruplardan bir tanesi İngilizce uyarıcılara maruz kalırken diğer grup Türkçe uyarıcılara maruz kalmıştır. Bu çalışmada katılımcıların verilen söylemleri okuma esnasında bu söylemleri tamamlamaları amaçlanmıştır. Bu yöntem sayesinde, katılımcıların örtük işletim sistemlerinin ölçümü amaçlanmıştır. Çalışmada kullanılan deneysel ögeleri doğrulamak amacıyla bir pilot çalışma yapılmıştır. Çalışmanın sonuçları hem İngilizce hem de Türkçe dillerinde söylemlerin devamını işletirken nedensel ya da devamlılık sağlayan bağlaçların ödünleyici ya da devamlılık sağlamayan bağlaçlara göre daha yüksek oranda tercih edildiği görülmüştür. Ayrıca, Üniform Bilgi Yoğunluğu Hipotezi doğrultusunda hem İngilizce hem Türkçe 'de, ödünleyici ya da devamlılık sağlamayan bağlaçlara kıyasla nedensel ya da devamlılık sağlayan bağlaçların daha fazla örtük bir şekilde işletildiği görülmüştür.
Anahtar Kelimeler: Nedensel, devamlılık sağlayan, ödünleyici, ön yargı, Üniform Bilgi Yoğunluğu Hipotezi

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INTRODUCTION

Previous research suggests that apart from the background information of a text or an utterance, the content and the organization of the text or utterance is also crucial in order to comprehend it, and this organization is often indicated through discourse signals (Jung, 2003). Tyler (1994) suggests that these discourse signals are metalinguistic devices that guide the listeners or the readers through the comprehension process of the linguistic text or utterance (cited in Jung, 2003). But in terms of processing these different discourse markers, some studies have revealed that we have biases towards certain discourse markers, such as causal and continuous markers, which can either facilitate the processing of a stimuli or hinder it due to instinctively resulted expectations. Hume and Beauchamp (2000) express their opinions related to these scientific facts by stating that the mind's thought and ideas are inter-connected in a systematic way in which there is a regularity and order, they further state that even though there are other sources of organizing ideas there are three primary factors connecting our ideas with which are resemblance, contiguity (in time or place) and cause or effect.

Fraser (1999) terms discourse markers, discourse connectives, discourse operators, or cue phrases as expressions which identify the relationship between the discourse segment which they are a part of and the prior discourse segments. In other words they make a link between the segment they introduce and the prior discourse He further states that discourse markers are a sub-categorization of pragmatic markers which play no role in determining the semantic meaning of the basic propositional content of a discourse segment that they are a part, but do have a critical role in the interpretation of the utterance (1996, p.893). Fraser (1999) also regards connectives to have a core meaning which is procedural rather than conceptual, and their interpretation is inferred through the context. Similarly, Schourup (1999) states that the meaning of the discourse marker is assessed in connection with the entire meaning conveyed by an utterance in which a discourse marker appears (p. 250).

As for the sub-classification of discourse markers, Fraser (1996) puts forward four principle types; the first of these is termed to be 'Topic Change Markers'. It is defined as topic change markers since the speaker makes a shift to a different topic (e.g. *before I forget, by the way, incidentally, on a different note, put another way, returning to my point, speaking of X, that reminds me* (Fraser, 1996, p.187)). 'Contrastive Markers' are the second group of discourse markers which signal that the utterance is either a denial or a contrast to the preceding discourse (Fraser, 1996), such as *but, instead, however, despite, in contrast* etc. Similarly, Halliday and Hasan (1976) refer to contrastive markers as 'adversative' markers. Elaborative Markers are the third sub-classification of discourse markers and according to Fraser (1996) that they constitutes a refinement of some sort on the preceding discourse (p. 188). Quirk et al. and Halliday and Hasan (1976) term 'Elaborative Markers' as 'additives' and give examples as *above all, moreover, and, also, furthermore, in addition* etc. 'Inferential Markers' on the other hand, is the final sub-classification of Fraser (1996) which signal that the force of the utterance is a conclusion which follows from the preceding discourse (p. 188). Halliday and Hasan (1976) define this categorization of inferential conjunctive elements as 'causal connectives', which cover relations of result, reason, and purpose (eg. *hence, so, as a result, in conclusion, consequently* etc.) together with also identifying 'temporal markers' (*the next, firstly, secondly, following this* etc.). Jung (2003) also states that discourse signaling, which signals the relationship, the importance and the evaluation between ideas, include signaling cues such as previews (e.g., *There are four stages of this culture shock*), summarizers (e.g., *To sum up so far*), emphasis markers (e.g., *This is the key*), and logical connectives (e.g., *and, or, first, and second*) (p. 563).

As for the processing of these discourse markers, Drenhaus et al (2014) state that different discourse connectors help processing and elicit predictions for upcoming information and they further state that discourse connectors are rapidly and incrementally integrated with earlier parts of the discourse. They further emphasize that previous research show how people have cognitive biases when processing texts, which lead them to better incrementally infer causal or continuous discourse relations rather than concessive or discontinous ones. Similarly, Kuperberg et al. (2011)'s ERP study found that causal coherence can influence incremental word-by-word discourse comprehension, even when semantic relationships between individual words are matched. It is also stated that no P600 effect was observed in the study which indicates that the participants didn't need to reanalyze the stimuli while incrementally processing it (Osterhout and Holcomb, 1992). This study gives an insight to the fact that causal and continuous discourse relations are generally expected and that humans have biases towards these discourse relations. Drenhaus et al (2014) also found in their ERP study that a P600 effect was observed in the concessive condition which also possessed a higher N400 effect compared to causal or continuous situations. The N400 amplitude gives insight to the predictability of a word in its discourse (e.g., van Berkum et al., 2005) and it informs that less expected words elicit larger N400s than more expected words. The fact that we have biases towards causal and continuous conditions can also be linked to Spooren and Sanders' (2008) study in which they state additive, temporal and causal markers are acquired before concessive markers. The fact that we acquire causal and continuous markers before adversative or discontinuous markers can also be an indication of the nature of the connectors. Köhne and Demberg (2013) also have found in their research that the processing of concessives took longer in their study than processing causal or continuous conditions which again give an insight that processing concessive discourse relations can be significantly difficult than processing causal or continuous forms. Similar research findings such as Asr and Demberg (2012) study based on the Penn Discourse Treebank also add that causal and continuous discourse relations are less likely to be expressed explicitly since it is more likely to be inferred even when expressed implicitly. Their study was based on the Uniform Information Density Hypothesis which led them to the prediction that discourse relations should be expressed explicitly with a discourse connector when they are unexpected, but may be implicit when the discourse relation can be anticipated (p. 2669). The Uniform Information Density Hypothesis, which was put forward by Levy and Jaeger (2007) suggests that optional linguistic elements or discourse markers can be omitted or implicitly expressed when they do not convey a novel message that is not expected. As a result, this hypothesis can be linked with the fact that since causal or continuous conditions lead to biases since they are significantly more expected in discourse, this can also lead them to be expressed implicitly rather than in an explicit form.

In relation to the previously mentioned literature, this study aims to further investigate the causal or continuous forms in incrementally processing upcoming discourse while comparing two different languages; English and Turkish. It is predicted there will be a higher preference towards causal or continuous connectives in processing upcoming discourse in both languages also in relation to the Uniform Information Density Hypothesis, causal or continuous discourse connectives will be expressed implicitly more frequently in comparison to concessive connectives in both English and Turkish. The time course for processing discourse in which concessive markers are adopted is predicted to be longer when compared to causal or continuous discourse markers in both languages. Finally the Uniform Information Density Hypothesis suggests that we express statements which are already expected and which do not convey novel information implicitly, hence, it is also predicted that the statements which are processed implicitly will have a lower time duration.

In respect to the aim and the predictions of the study, the following research questions are aimed to be investigated.

1. What is the frequency of different discourse connectives processed in the two different languages?
2. What is the nature of the implicitly and explicitly expressed discourse connectives in both languages?
3. What is the time-course of processing different kind of discourse connectives in both languages, both implicitly and explicitly?

METHODOLOGY

Participants

There are 14 participants participating in this experimental study. Among these participants, while 7 of them are exposed to English-stimuli, the other 7 participants are exposed to Turkish-stimuli experimental items. The participants in the English-stimuli exposure group are all English instructors at a state university in Turkey. The participants in the Turkish-stimuli exposure group are all native speakers of Turkish (see Table 1 for participants' information).

Table 1. *Information of the Participants*

	English Stimuli Exposure Group			Turkish Stimuli Exposure Group		
Participants	Native Language	Age		Native Language	Age	
1	Turkish	28		Turkish	30	
2	Turkish	28	Mean of	Turkish	28	Mean of
3	Ukranian	29	Age: 28.3	Turkish	27	Age: 28.9
4	Turkish	25	SD: 1.6	Turkish	28	SD: 1.2
5	Turkish	29		Turkish	30	
6	Turkish	29		Turkish	28	
7	Turkish	30		Turkish	27	

Materials and Procedure

In this contrastive experimental study, 60 experimental items were formed for both the English-stimuli exposure group and the Turkish-stimuli exposure group (see Example 1 and 2). The 20 of the items were non-directive in which the first sentence of the stimuli expresses 2 different options for a situation or choice. The second sentence identifies a possible preference. The participants were expected to continue the utterance by completing the stimuli with a possible alternative. The remaining 20 sentences were directive in nature since they can enhance the possibility of discontinuous processing. The first sentence expresses two different options for a preference. The second sentence identifies an external subject's preference while the third sentence identifies the initial subject's own tendency. 20 filler items were also added to avoid automacity. In order to achieve validity with the created items, a pilot study was done with 5 voluntary participants before conducting the study.

Example 1. English-Stimuli Items

Non-Directive Items:

Alex is confused about going to the cinema or going out on a picnic. He wants to watch the new film. _____

Directive Items:

Alex is confused about going to the cinema or going out on a picnic. His friend wants to have picnic. At the same time, Alex wants to watch a new film. _____

Filler Items:

*Ayşe wanted to buy chocolate and flowers. She bought both of them from the market and*_____

Example 2. Turkish-Stimuli Items

Non-Directive Items:

*Merve, sinemaya ya da pikniğe gitmeyi düşünüyor. Yeni gelen filmi izlemeyi çok istiyor.*_____

Directive Items:

*Ali, yeni bir kitap ya da yeni bir DVD almak istiyor. Arkadaşı film izlemek istiyor. Aynı zamanda, Ali okumayı çok seviyor.*_____

Filler Items:

*Ceren bir DVD ve bir kitap almak istiyordu. Her ikisini de alışveriş merkezinden aldı ve*_____

The treatment was done in individual sessions. Before conducting the study a short training session was carried out with 5 sentences. The items were shown one-by-one to the participants through a computer and the participants were expected to continue the sentences at the instance of reading the statements. All of the items, including the filler items, are presented in a randomly mixed order. The whole process was audio-recorded for analysis.

RESULTS

1. Results of the English-Stimuli Exposure Group

The results of the analysis of the English-stimuli exposure group are in line with the literature (Tyler, 1994; Drenhaus et al , 2014; Kuperberg et al., 2011, Spooren and Sanders, 2008; Köhne and Demberg, 2013) which puts forward that while incrementally processing discourse, we have a tendency to infer causal or continuous relations in upcoming texts or utterances. The results of the present study also show that both in the directive-stimuli exposure group and the non-directive stimuli exposure group there was a higher frequency rate of processing causal relations then concessive or discontinuous relations (see Table 2). The results of the frequency analysis also reveal that there was a higher tendency to produce the discourse relations explicitly in both conditions. In both of all the implicit and explicit processing types, it was also found that causal or continuous markers were processed more frequently than discontinuous ones.

Table 2. *The Frequency Results of the English-Stimuli Exposure Group*

Directive-Stimuli				Non-Directive Stimuli			
Implicit Processing		Explicit Processing		Implicit Processing		Explicit Processing	
Causal	Concessive	Causal	Concessive	Causal	Concessive	Causal	Concessive
34(83%)	7(17%)	51(80%)	13(20%)	20(100%)	0	71(84%)	14(16%)
Total: 41 (39%)		Total: 64 (61%)		Total: 20 (19%)		Total: 85 (81%)	

As for the duration of processing different discourse markers for the English-stimuli exposure group in spoken discourse, the results of the present study reveal that the duration of processing directive prompts were significantly longer than processing non-directive prompts (p<.01) (see Table 3). This result was expectable since the directive prompts were more challenging compared to the non-directive prompts, hence they entailed an extra statement which can foster discontinuous processing. Furthermore, in the directive stimuli exposure group, the duration of processing upcoming discourse with explicitly stated concessive connectors were significantly longer than explicitly stated causals (F(1,62)=13.1, p <.05). However, In the directive stimuli exposure group, there was no significant difference in the duration of implicitly processing upcoming discourse in causal and concessive conditions (F(1,39)=.11, p>.05). Finally, In the non-directive stimuli exposure group, explicitly processing concessive relations were found to be significantly longer than processing causals (F(1,83)=9.7, p <.05).

Table 3. *The Duration of Processing Upcoming Discourse in the English-Stimuli Exposure Group (ms.)*

Directive-Stimuli								Non-Directive Stimuli							
Implicit Processing				Explicit Processing				Implicit Processing				Explicit Processing			
Causal		Concessive		Causal		Concessive		Causal		Concessive		Causal		Concessive	
M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
21	58	22	72	837	52	14	55	14	63	0	0	77	44	11	448
54	3	38	8		1	30	3	37	7			5	2	78	
N:34		N:7		N:51		N:13		N:20		N:0		N:71		N:14	

2. Results of the Turkish-Stimuli Exposure Group

The results of the Turkish-stimuli exposure group are also found to be in line with the literature (Tyler, 1994; Drenhaus et al , 2014; Kuperberg et al., 2011, Spooren and Sanders, 2008; Köhne and Demberg, 2013). Similar to the English-stimuli exposure group, the result indicate that there is a higher frequency of processing causal or continuous discourse relations in contrast to discontinuous ones (see Table 4). The results of the frequency analysis also indicate that there was a higher tendency to produce the discourse relations explicitly in both the directive-stimuli exposure group and the non-directive stimuli exposure group. The results also reveal that, when the participants adopted implicit processing, a relatively high percentage was seen while processing causal conditions in contracts to discontinuous conditions. In the English-stimuli exposure group it was even seen that in the non-directive stimuli exposure group, no implicitly processed concessive markers were found (see Table 2).

Table 4. *The Frequency Results of the Turkish-Stimuli Exposure Group*

Directive-Stimuli				Non-Directive Stimuli			
Implicit Processing		Explicit Processing		Implicit Processing		Explicit Processing	
Causal	Concessive	Causal	Concessive	Causal	Concessive	Causal	Concessive
22(92%)	2(8%)	55(68%)	26(32%)	8(89%)	1(11%)	81(84%)	15(16%)
Total: 24 (23%)		Total: 81 (77%)		Total: 9 (9%)		Total: 96 (91%)	

The duration of processing upcoming discourse in the Turkish-stimuli exposure group were found to yield similar results to the English-stimuli exposure group (see Table 5). Firstly, the duration of processing directive prompts were significantly longer than processing non-directive prompts (p<.01). In the directive stimuli exposure group, the duration of processing upcoming discourse with explicitly stated concessive connectors

were significantly longer than causals (F(1,79)=,25.8 p <.01). However, in the directive stimuli exposure group, even though the processing of concessive discourse markers were higher, there was no significant difference in the duration of implicitly processing upcoming discourse in causal and concessive conditions (F (1,22)=3, p>.05). In the non-directive stimuli exposure group, explicitly processing discontinuous discourse was found to be significantly longer than processing causals (F(1,94)=9.5, p <.05). Yet, there was no significant mean difference between implicitly processing connectors (F(1,7)=.1, p>.05).

Table 5. *The Duration of Processing Upcoming Discourse in the Turkish-Stimuli Exposure Group (ms.)*

Directive-Stimuli								Non-Directive Stimuli							
Implicit Processing				Explicit Processing				Implicit Processing				Explicit Processing			
Causal		Concessive		Causal		Concessive		Causal		Concessive		Causal		Concessive	
M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1793	748	2750	774	784	295	1258	583	1130	307	1254	00	693	303	1108	1010
N:22		N:2		N:55		N:26		N:8		N:1		N:81		N:15	

DISCUSSION AND CONCLUSION

The results of the present study, which focus on spoken production, are in line with previous research (Tyler, 1994; Drenhaus et al , 2014; Kuperberg et al., 2011, Spooren and Sanders, 2008; Köhne and Demberg, 2013) suggesting that we have a certain tendency or bias towards processing causal or continuous conditions. It was found that in both Turkish and English 'causal connectors' were chosen more frequently than concessive connectors in both implicit and explicit processing types. This finding can be linked to Spooren and Sanders' (2008) study in which they state that additive, temporal and causal markers are acquired before concessive markers. As a result, this can be an indication that in both languages causals were seen to be processed more frequently in contrast to concessive or discontinuous markers. Similarly, Kuperberg et al. (2011) found in their ERP study that causal coherence influenced incremental word-by-word discourse comprehension, even when semantic relationships between individual words were matched. They stated that no P600 effect was observed in the study which indicates that the participants didn't need to reanalyze the stimuli while incrementally processing it. This can also be an indication that causal and continuous discourse relations are generally expected by humans.

In terms of duration, in all of the conditions, it was seen that processing concessives were significantly longer than processing causals. In relation to this finding, Köhne and Demberg (2013) also state in their research that the processing of concessive discourse relations took longer in their study than processing causal or continuous conditions which can give an insight that processing concessive discourse relations can be significantly difficult than processing causal or continuous forms. Even though, in most conditions the Turkish-stimuli exposure group had a less duration of processing upcoming speech, it was found that there was no significant different between two languages. A reason for this may be due to the fact that the English-stimuli exposure groups were all advanced English speakers. In relation to the Uniform Density Hypothesis (Levy and Jaeger, 2007), it was found that causal conditions were processed implicitly more frequently than concessive conditions. This can also be in line with our nature of incrementally predicting causal conditions since we omit it or implicitly express it which implies that it does not convey a novel message that is not expected.

Another interesting finding from the study is that both in the Turkish-stimuli exposure group and the English-stimuli Exposure, the duration of implicitly processing connectors (both causal and concessive) were significantly longer than explicit processing ($F(1,18)=7.8$, $p < .01$). The Uniform Information Density Hypothesis suggests that optional linguistic elements or discourse markers can be omitted or implicitly expressed when they do not convey a novel message that is not expected. Hence it was predicted in the study that causal connectors would be processed more frequently than concessive connectors. This had been found to be the case in the study, however, the duration for processing implicit discourse markers were found to be significantly longer, which creates stimulation to further investigate this issue since it was expected that incrementally processing discourse relations which do not convey any novel messages (in this case, the causal discourse relations) would yield a shorter period of time in terms of processing.

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