

Turkish Correlatives in Monolingual Turkish and Bilingual Turkish-German Grammar

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Abstract. Our paper presents an experimental study on multiple correlatives in Turkish. The research questions that guided our study are twofold: (a) What are the presuppositions of multiple correlatives in Turkish? (b) Is there a difference between monolingual Turkish speakers and bilingual Turkish-German speakers with respect to multiple correlatives? Question (a) targets the presuppositions of interrogative-based correlatives. Since the presuppositions of multiple questions are crosslinguistically variable, are the presuppositions of correlatives based on them variable in a parallel way? Question (b) targets crosslinguistic variability in the acceptability of multiple correlatives. While Turkish permits them, German does not. Does this variability affect bilingual speakers' grammars? Our results indicate that (a) multiple correlatives share the presuppositions of the questions they contain and (b) bilingual speakers' grammar of correlatives is different from that of monolingual speakers. The paper sheds a new light on crosslinguistic variation in the domain of questions and correlatives and on bilingual grammar.

Keywords: semantics; correlatives; study; bilingual grammar; Turkish; German

1. Introduction. The English multiple question in (1) is said to presuppose, on its pair-list reading, that each girl played against exactly one boy (Higginbotham & May 1980, Dayal 1996, 2002, Kotek 2016, 2019). Generally, an English multiple question is claimed to give rise to this type of presupposition (PSP), which we will call its injective PSP in (3).

(1) *Which girl played which boy?*

(2) a. pair-list reading:

Anne played Tom, Bethany played Stan and Cecilia played Vincent.

PSP: Each girl played exactly one boy.

b. single-pair reading:

Anne played Tom.

(3) [Which N_1 [which N_2 [φ ... t_1 ... t_2 ...]]]

injective PSP:

for each x such that $[[N_1]](x)$, there is exactly one y such that $[[N_2]](y) \ \& \ \varphi(x)(y)$

But the PSPs of multiple questions are not generally agreed upon (see Xiang 2019) and probably crosslinguistically variable. Hindi is argued to share the injective PSP (Dayal 1996). Simik (2012) argues that Czech allows multiple questions without such a PSP (or indeed any

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strong question-induced PSP). Krifka (2001) argues for a weaker PSP of multiple questions, according to which (1) would presuppose merely that each girl played a boy. Our intuitions for German also suggest a weaker PSP than (3) (and we may speculate that Krifka might have been guided by intuitions about German in his paper as well). A first goal of our study is to find out about the PSPs of the Turkish multiple question in (4), and the PSPs of the multiple correlative that contains that question in (5). Do they have the injective PSP in (3)?

- (4) *Hangi kız hangi oğlan-la oynadı?*
 which girl which boy-with play-PST²
 ‘Which girl played which boy?’
- (5) *Hangi kız hangi oğlan-la oynadı-y-sa, (o) o-nu yen-miş-tir.*
 which girl which boy-with play-PST-COP-COND.3SG³ (she) he-ACC beat-EV.PFV-DIR
 Lit.: ‘Which girl played which boy, she beat him.’
 ‘If a girl played a boy, she beat him.’

Turkish correlatives have been analyzed as interrogative based in Demirok (2017a,b), following Hirsch’s (2016) analysis of *wh-ever* free relatives. These analyses would predict that the PSP of (4) is inherited in (5). Generally speaking, it is an interesting question whether the multiple question and the multiple correlative share the same PSPs (this has been argued for Hindi in Dayal 1996, but note that Hindi correlatives are not in fact question based; see also Beshears 2017).

The availability and interpretation of multiple correlatives is a second point of crosslinguistic variation relevant for our study. In contrast to Turkish, English and German allow single correlatives, cf. (6) but not multiple ones, cf. (7).

- (6) *Welch-es Mädchen auch immer gegen Chris gespielt hat, sie wird (wohl) gewonnen haben.*
 which-NEU girl also always against Chris played has, she will.3SG (probably)
 won have
 ‘Whichever girl played Chris, she has (probably) won.’
- (7) a. **Welch-es Mädchen auch immer gegen welch-en Junge-n gespielt hat, sie wird ihn (wohl) geschlagen haben.*
 which-NEU girl also always against which-ACC boy-ACC played has, she will.3SG him (probably) beaten have
 ‘Whichever girl played against which boy, she (probably) beat him.’
 b. **Whichever girl played which boy, she beat him.*

In addition to eliciting judgements about (4) and (5) from monolingual Turkish speakers, we elicited judgements from bilingual Turkish-German speakers. The crosslinguistic contrast makes it interesting to ask whether bilingual grammar differs from monolingual grammar in this domain. The second goal of our study is thus to investigate bilingual grammar.

The paper is structured as follows: section 2 provides the required semantic background. Section 3 presents our empirical study. Section 4 discusses its results. Conclusions are presented in section 5.

2. Theoretical background. This section elaborates on the semantic background of our study. We briefly introduce question semantics (section 2.1). On this basis, we sketch the

² Abbreviations used in glosses (given here unless specified in the Leipzig Glossing Rules): DIR - modal particle, EV – evidential, NEU-neuter.

semantic analysis of correlatives (section 2.2). With these analyses in place, we come back to the issue of crosslinguistic variation introduced above (section 2.3).

2.1. QUESTION SEMANTICS. We adopt a standard Hamblin/Karttunen semantics of questions (Hamblin 1973, Karttunen 1977). A single *wh*-question like (8a) has the semantics in (8b) in this theory, a set of alternative propositions. The semantics of a multiple question like (9a) is sketched in (9b).

- (8) a. *Which girl played Chris?*
 b. {that x played Chris | girl(x)}
- (9) a. *Which girl played which boy?*
 b. {that x played y | girl(x) & boy(y)}

The representations in (8b) and (9b) do not show the PSPs of the respective questions. Singular *which*-questions presuppose that there is a unique true answer. Multiple questions have been claimed to allow (at least) single-pair and pair-list readings, illustrated in (2a,b). The pair-list reading has been associated with the injective PSP (3), in the example, (10) (Higginbotham & May 1980, Dayal 1996, Kotek 2016, 2019).

- (10) $\forall x[\text{girl}(x) \rightarrow \exists! y[\text{boy}(y) \ \& \ \text{play}(x,y)]]$
 ‘For all x such that x is a girl: there is a unique y such that y is a boy and x played y.’
 In other words: Each girl played a boy and no more than one boy.

It is not completely clear what the source of this PSP is. Kotek (2016, 2019) proposes a presuppositional question operator. We have no new insights to offer on this matter. Granting that the PSP is there, in English at least, the prediction is that (9a) is acceptable in contexts (11a) and (11b) but not in (11c).

- (11) a. Anne played Tom, Bethany played Stan and Cecilia played Vincent.
 b. Anne played Tom.
 c. Anne played Tom and Stan, Bethany played Vincent.

2.2. CORRELATIVE SEMANTICS. In a correlative, a subordinate clause containing a relative pronoun or an interrogative pronoun is combined with a matrix clause that contains a pronoun or demonstrative that is intuitively anaphorically related to the subordinate clause; see Liptak (2009) for theoretical and crosslinguistic discussion.

Building on Rawlins’ (2013) semantics of unconditionals, Hirsch (2016) develops a semantic analysis of correlatives and *wh-ever* free choice relatives. His analysis is adapted to Turkish correlatives, in particular, by Demirok (2017a,b). The key property of this family of analyses is that the subordinate clause in the correlative structure (the free choice relative (FCR) in (13a)) is a question and has a question semantics. We illustrate the analysis in (13) for the German example (6), repeated in (12).

- (12) *Welch-es Mädchen auch immer gegen Chris gespielt hat, sie wird (wohl)*
 which-NEU girl also always against Chris played has, she will.3SG (probably)
gewonnen haben.
 won have
 ‘Whichever girl played Chris, she has (probably) won.’

- (13) a. LF: $[\text{ALL}_{\text{prop}} [\text{IF-THEN} [\text{FCR Q} [\text{Which girl played Chris}]] [_ \text{won} _]]]$
 b. $[[\text{which girl}]] = \{x \mid \text{girl}(x)\}$
 c. $[[\text{which girl played Chris}]] = \{x \text{ played Chris} \mid \text{girl}(x)\}$
 d. for all propositions p: $p \in \{ \text{if } x \text{ played Chris, then } x \text{ won} \mid \text{girl}(x) \} \rightarrow p \text{ is true}$

In the LF (13a), the question is embedded under a covert conditional operator. This creates a set of conditionals. The universal operator at the top of the structure states that all these conditionals are true, cf. (13d), deriving the appropriate semantics for (12). It is left open in (13) how the anaphoric pronoun in the matrix clause finds its meaning. We return to this point below.

2.3. VARIATION. Languages vary with respect to the availability of multiple correlatives. Hindi and Turkish allow multiple correlatives, see (5), while English and German do not, see (7) (cf. Liptak 2009, Demirok 2017a,b).

It is less clear what the PSPs of (multiple) correlatives are. While Hindi multiple correlatives have been associated with the injective PSP, this has not been demonstrated for Turkish. Given that the Rawlins/Hirsch/Demirok analysis makes the question a component of the correlative, one would expect the correlative to share the PSP of the question it is based on. But this has not been properly established either. Since there is some reason to think that the PSP of multiple questions is crosslinguistically variable (cf. the German multiple question in (14) seems acceptable in all three contexts in (11), though this is pending a thorough empirical investigation), it makes sense to ask what the PSP of Turkish multiple questions and Turkish multiple correlatives are.

- (14) *Welch-es Mädchen hat gegen welch-en Junge-n gespielt?*
 which-NEU girl has against which-ACC boy-ACC played
 ‘Which girl played which boy?’

The contrasts between Turkish and German motivate a second feature of our empirical study: We ask whether bilingual Turkish-German speakers differ from monolingual Turkish speakers. We are guided by the results of a recent study on bilingual speakers on quantifier scope by Scontras et al. (2017). They found that when two grammars meet, the simpler system prevails. In their case, the simpler system is a system without quantifier raising (QR). It is conceivable that a grammatical system without multiple correlatives is simpler than one with multiple correlatives. If so, then bilingual Turkish-German speakers might be different from monolingual Turkish speakers in not allowing multiple correlatives. The next section introduces the empirical study that investigates these issues.

3. Questionnaire study. In our study, two groups of native speakers of Turkish judged the appropriateness of *wh*-questions and correlatives presented in different contexts on a scale from 1 (= *completely appropriate*) to 5 (= *completely inappropriate*). One group consisted of 20 monolingual speakers, and the other group consisted of 20 bilingual speakers (see below for details). The experimental items, i.e. *wh*-questions and correlatives, were supplemented by a set of fillers.

3.1. METHOD. We talk about the materials used and the overall design of the study in section 3.1.1. In section 3.1.2., we briefly discuss the procedure and finally in section 3.1.3. provide more information on both the monolingual and the bilingual participants.

3.1.1. MATERIAL AND DESIGN. We established a within design by crossing two within participant factors, the two-level factor CONSTRUCTION (*wh*-question vs. correlative) times the three-level factor CONTEXT (single-pair, vs. pair-list vs. presupposition violation (*PSP)). We will call this the “basic design” of the study. A Turkish *wh*-question used in our experiment was presented in (4), the corresponding correlative is in (5) above. The contexts preceding *wh*-questions and correlatives are illustrated in (15).

- (15) “You know that the students have organized a series of tennis matches, ...”
 a. “...and that there was exactly one tennis match today, which was between a girl and a boy. All the girls play tennis very well. ...” (–SINGLE PAIR–)

- b. "...and that there were three tennis matches today, each one between a girl and a boy. You also know that Aylin, Sevda und Mine played. All three girls play tennis very well. ...” (–PAIR-LIST–)
- c. "...and that there were three tennis matches today, each one between a girl and a boy. You also know that Mine played more than one game. She is an excellent tennis player. ...” (–*PSP–)
- "...You ask your colleague Polina: (4) /...You say to your colleague Polina: (5)"

Thus, there were six conditions in the basic design which were implemented in two experimental items each embedded in a scenario. The six conditions of either item were tested consecutively, preceded by the same “global context” in (16). This context sets the scene, i.e. introduces the situation, the persons in the test material, etc. for all the individual items in the series so that digressions or misunderstandings of the individual scenarios are minimized. This procedure has been also applied in Tiemann et al. (2011).

- (16) “Imagine that you are a teacher. You and the other teachers are at a lovely youth hostel in the midst of nature where you are supervising a group of students of yours. You are spending a long weekend together. The youth hostel offers great opportunities to do sports, among other things a tennis court and a soccer field. Several girls and boys in your student group play tennis. Many boys and a couple of girls enjoy playing soccer.”

It is also worth noting that both the individual contexts and the items were all presented in Turkish eliminating the danger of interferences from German for the participants and the interviewer. The items were distributed across four lists and randomized by hand. The four lists were run by five language consultants each in every language group (monolingual vs. bilingual). Each participant worked on 30 items in total, consisting of six variants of two experimental items and 18 fillers.

We conjecture that the *wh*-question carries the injective PSP from (3)/(10), a PSP that is satisfied by the single-pair as well as the pair-list context, but that is violated in the *PSP context. For instance, the context in (15-c) violates the injective PSP because Mine played more than one boy. Since Turkish correlatives are interrogative based, the correlative is expected to carry the same presupposition. Thus, we expect that both *wh*-questions and correlatives are judged more appropriate in the single-pair and pair-list context compared to the *PSP context. We make no prediction on the relative strength of the drop in appropriateness for the two constructions.

In addition to the within-participants design, we consider the two-level group factor SPEAKER. We are especially interested in whether monolingual and bilingual Turkish speakers respond to the correlatives differently, i.e., whether any effect of the basic design interacts with the group factor SPEAKER.

As fillers we used *Yes/No*-questions, conditionals, comparatives and other PSP-triggers like *again* and *still*. Since the latter will become important in the results section, we provide the items in (17) and (18). The a.-contexts are appropriate, i.e., they meet the PSP of the trigger, e.g., Sevda beat Kemal before within a relevant time frame. The b.-contexts are inappropriate, i.e., they violate the PSP of the trigger: e.g., Sevda didn’t beat Kemal before within a relevant time frame. In the c.-contexts the assertion introducing the trigger, ‘Sevda beat Kemal’, is not true and the PSP is not met either.

- (17) PSP trigger ‘again’:
 (A) *Sevda Kemal-i yine yen-di.*
 Sevda Kemal-ACC again beat-PST
 ‘Sevda beat Kemal again.’

- a. You know that students have organized a series of tennis matches and that Sevda won against Kemal yesterday. Today, they both are again playing against each other. During a walk with your colleague Polina, you hear Sevda cheering “Yippieeh” from the tennis court. You say: **(A)**
- b. You know that students have organized a series of tennis matches. At breakfast, you heard that Sevda and Kemal plan to play tennis against each other today. You know that Sevda is a good tennis player, while Kemal is on the court for the first time in many years today. During a walk with your colleague Polina, you hear Sevda cheering “Yippieeh” from the tennis court. You say: **(A)**
- c. You know that students have organized a series of tennis matches and that Sevda likes playing tennis and wants to play today. You also know that Kemal has had a weak heart since birth and is not allowed to do any sports. During a walk with your colleague Polina, you hear Sevda cheering “Yippieeh” from the tennis court. You say: **(A)**

(18) PSP trigger ‘still’:

(B) *Ali hala futbol antrenman-in-da.*

Ali still soccer training-POSS.3SG-LOC

‘Ali is still in the soccer training.’

- a. You know that several teachers in your group are very good soccer players and that the boys have organized individual trainings with these teachers. Today, several individual trainings of your colleague Deniz take place. While you are walking with your colleague Polina, she speculates that probably Deniz is training Ali. You hear Ali cheering wildly from the soccer field and say to Polina: **(B)**
- b. You know that several teachers in your group are very good soccer players and that the boys have organized individual trainings with these teachers. Today, several individual trainings of your colleague Deniz take place. Ali, one of the students, has chosen soccer. During a walk with your colleague Polina, Ali runs towards you in the direction of the soccer field. Shortly after, you hear the sound of a ball being played from the soccer field. You say: **(B)**
- c. You know that several teachers in your group are very good soccer players and that the boys have organized individual trainings with these teachers. During a walk with your colleague Polina in the morning, she speculates that probably right now your colleague Deniz is training Ali. You know that Ali has a congenital deformity of the hip and is not allowed to do any sports. You say: **(B)**

3.1.2. PROCEDURE. To learn more from our Turkish speakers than just how they judge our stimuli, we treated them as consultants similar to a small-scale field study (cf. methodology by Matthewson 2004, 2011, Bowern 2008 and Chelliah and de Reuse 2011). Each participant was interviewed individually by a bilingual Turkish-German speaker either in person or online via a video conferencing platform in a paper-and-pencil style. The interviewer first obtained information on sociolinguistic data (see below in subsection 3.1.3.). The participants were then presented with several training items to familiarize themselves with the task. Another particularity of the procedure was that each experimental item consisted of the context, the target sentence and the 5-point-scale, plus a comment section where the interviewer recorded comments given by the informants. This opened the possibility of checking the individual items and understanding better why the respective point on the scale was chosen. On average, each interview took approximately 45 minutes to complete. An example item is given in Figure 1:

1. Kız ve erkek öğrencilerin bir tenis maçı serisi düzenlediklerini ve bugün bir kız ve bir erkek arasında tam bir tane maçın oynandığını biliyorsun. Meslektaşın Polina'ya soruyorsun:

(A) Hangi kız hangi oğlanla oynadı?

Bu durumda (A) ne kadar uygun?

* * * * *
çok iyi iyi şüpheli kötü çok kötü

Kommentar:

Figure 1. Example item

Because of our detailed elicitation method, time constraints limited us to just two scenarios (items) to test the experimental conditions reported in this paper. Therefore, we analyzed the data only with the single random factor PARTICIPANTS.

3.1.3. PARTICIPANTS. We elicited demographic data on the participants, namely: name, age, sex, as well as profession, place of birth, place of residence, L1, L2 and further languages spoken by the participants along with the age of their acquisition. We also asked about the native languages of the participants' parents and partner, if applicable. For bilingual speakers, we asked, in addition, which language was spoken in which milieu. The last questions helped determining the language proficiency of the heritage speakers for Turkish.

Among the monolingual Turkish speakers, there were 17 female and 3 male speakers with their age ranging between 23 and 43 years. All the monolingual speakers were born and raised in Turkey and still lived there at the time of the study. Most of the participants are from Bursa.

The bilingual speakers in the study are heritage speakers of Turkish, since they were all born and raised in Germany. These are early simultaneous and/or sequential bilinguals. More concretely, 13/20 were surrounded by Turkish at home until entering the kindergarten at the age of three. For all of our bilingual participants, Turkish was the language predominantly spoken at home. For the bilingual group, 20 female speakers took part in the study in total aged between 22 and 32 years.

3.2. RESULTS. We start this section by reporting on the ANOVAS⁴ of the basic design. The data of both groups, i.e. all 40 participants, were subjected to an analysis of variance for the within-design CONSTRUCTION (*wh*-question, correlatives) × CONTEXT (single-pair, vs. pair-list

⁴ A remark on our data analyses seems to be in order. The present study, though basically experimental, also has an explorational flavor. The intensive collaboration of our consultants with the interviewer (cf. 3.1.2) made the sessions quite demanding. We therefore took care to restrict ourselves to a manageable set of test materials, providing no more than two scenarios as possible instances of item as a random factor. Such a random factor could be used to generalize from the sample to the population of items (cf. Clark 1973). Since we consider our sample of two items insufficient for such a generalization, we include participants as a single random factor and we do so by computing analyses of variance.

vs. presupposition violation (*PSP)) crossed with the group factor SPEAKER (monolingual, bilingual). Two orthogonal contrasts were specified for the three-level factor CONTEXT: the first contrast compares the conditions single-pair and pair-list; the second contrast compares the mean of both of them against *PSP. While we made no prediction for the first contrast, we predicted for the second contrast that the conditions single-pair and pair-list taken together would be judged as more appropriate than *PSP.

The appropriateness means for the within design of CONSTRUCTION \times CONTEXT are plotted in Figure 2.

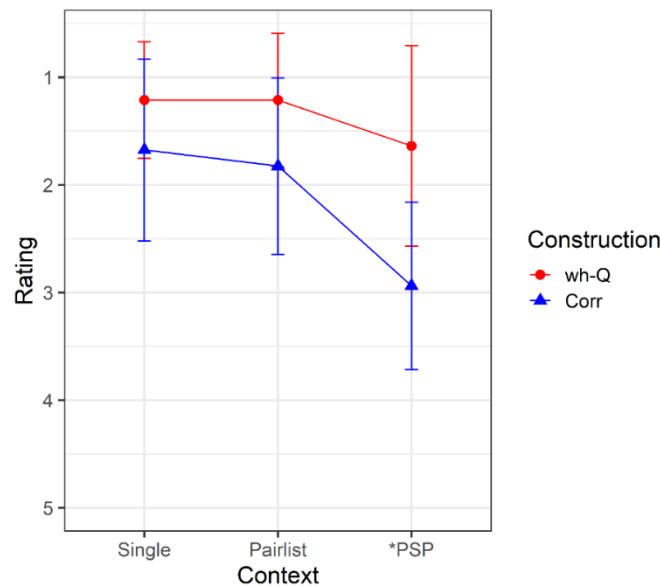


Figure 2. Results of the basic design, CONTEXT \times CONSTRUCTION (averaged across speaker groups)

The analysis revealed a main effect of CONSTRUCTION [$F(1,38) = 49.0, p < .001, \eta^2 = .563$], i.e. *wh*-questions were judged more appropriate than correlatives when averaged across contexts. The main effect of the three-level factor CONTEXT as well as its interaction with CONSTRUCTION were also significant [$F(2,76) = 41.7, p < .001, \eta^2 = .523$; $F(2,76) = 26.7, p < .001, \eta^2 = .412$; respectively]. Both the main effect and the interaction were significant for the second contrast (single-pair / pair-list vs. *PSP) but not for the first (single-pair vs. pair-list). Taken together, single-pair and pair-list contexts were judged more appropriate than *PSP contexts [main effect: $F(1,38) = 52.6, p < .001, \eta^2 = .581$], yet the drop in judged appropriateness was stronger for correlatives than for *wh*-questions [interaction: $F(1,38) = 42.2, p < .001, \eta^2 = .526$]. We interpret these results as showing that (i) a PSP violation leads to decrease in the acceptability ratings and that (ii) the PSP is present in both the *wh*-questions and the corresponding correlatives in Turkish. However, the PSP violation impairs correlatives more strongly than *wh*-questions.

Turning to the comparison between the two speaker groups, there was only one significant difference which manifests itself in the interaction of SPEAKER with CONSTRUCTION (cf. Figure 3): The stronger general drop in judged appropriateness for correlatives compared to *wh*-questions was more pronounced in judgments of bilingual compared to monolingual Turkish speakers [interaction of CONSTRUCTION \times SPEAKER: $F(1,38) = 10.5, p = .002, \eta^2 = .217$]; i.e. bilinguals find multiple correlatives less acceptable than monolinguals. CONTEXT did not enter into any interaction with SPEAKER. Thus we don't see a reliable difference between monolingual and bilingual speakers with respect to the PSP-violation in *wh*-questions or correlatives.

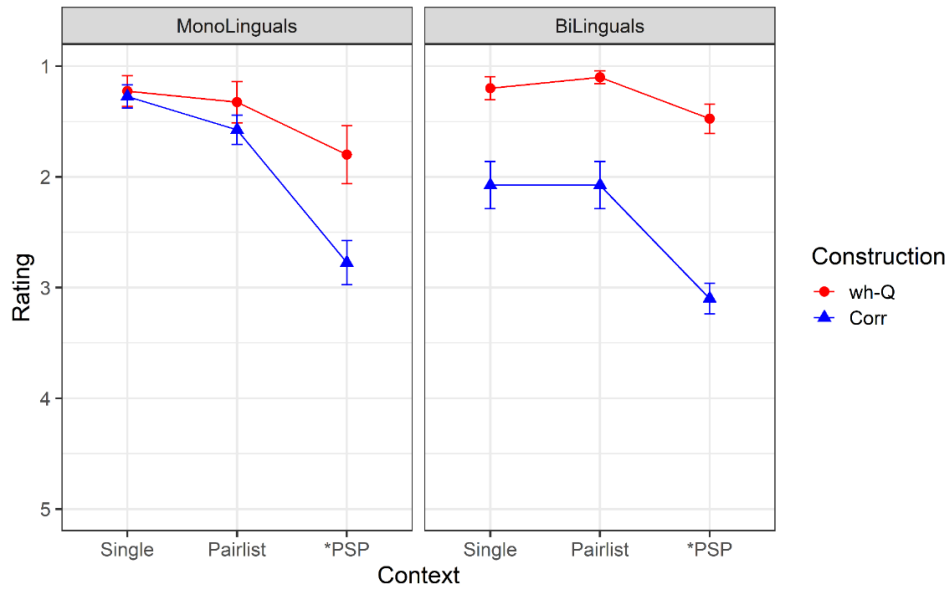


Figure 3. Results of the basic design, separately for monolingual (left panel) and bilingual speakers (right panel)

There is some evidence in the fillers that the sensitivity to a PSP-violation differs between the two speaker groups. Figure 4 shows the results for the two PSP triggers *yine* ‘again’ (left panel) and *hala* ‘still’ (right panel) when paired in an appropriate context (PSP met), an inappropriate context (PSP violated) and with a false assertion (cf. (17) and (18) above). To begin with, monolingual Turkish speakers judged stimuli with either trigger per se more appropriate than bilingual Turkish speakers [‘again’: $F(1,38) = 4.6, p < .05, \eta^2 = .109$; ‘still’: $F(1,38) = 9.5, p < .01, \eta^2 = .199$].

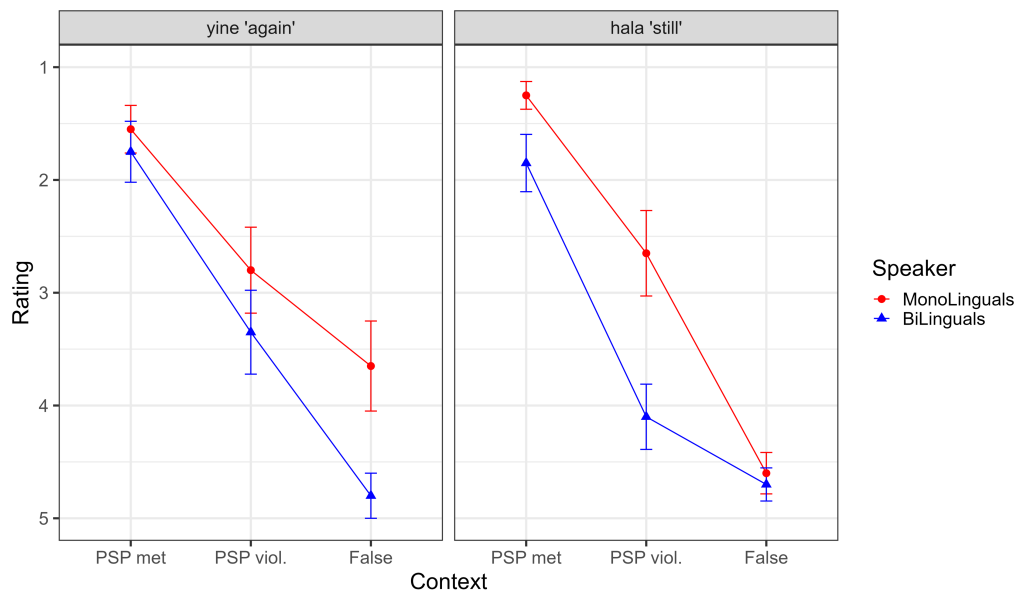


Figure 4. Results of PSP triggers among fillers, separately for *yine* ‘again’ (left panel) and *hala* ‘still’ (right panel), in three different contexts

CONTEXT had a significant influence for either PSP-trigger, ‘again’ [$F(2,76) = 39.0, p < .001, \eta^2 = .507$] and ‘still’ [$F(2,76) = 97.4, p < .001, \eta^2 = .719$]. Correspondingly, judgements decline from appropriate to inappropriate contexts and further from inappropriate contexts to

false assertions [‘again’, PSP met – PSP viol.: $F(1,38) = 25.6, p < .001, \eta^2 = .403$; PSP viol. – False: $F(1,38) = 11.9, p = .001, \eta^2 = .238$; ‘still’, PSP met – PSP viol.: $F(1,38) = 46.6, p < .001, \eta^2 = .551$; PSP viol. – False: $F(1,38) = 34.4, p < .001, \eta^2 = .475$]. However, CONTEXT interacted with SPEAKER only for ‘still’ [$F(2,76) = 4.7, p = .01, \eta^2 = .109$] but not for ‘again’. As for the contrasts, the interaction shows up for the PSP violation if compared to the false assertion but not if compared to the appropriate context [‘still’, PSP met – PSP viol.: $F(1,38) = 2.5, p = .120, \eta^2 = .062$; PSP viol. – False: $F(1,38) = 9.7, p = .04, \eta^2 = .203$], cf. Figure 4. To summarize, we observe here a piece of evidence for a stronger sensitivity for a PSP-violation on the part of bilingual compared to monolingual speakers. Yet we see no obvious reason why this evidence should not generalize to other PSP violations.

4. Discussion. We address the consequences of these empirical results in this section, focusing first on the empirical results (section 4.1.) and then on theoretical repercussions (section 4.2.). Section 4.3. discusses bilingual grammar.

4.1. TURKISH. Our empirical study clearly shows that multiple questions and multiple correlatives in Turkish have the injective PSP in (3)/(10). Acceptability of both the question and the correlative decreases in contexts in which the PSP is not met.

This is shown not just by the quantitative data, but also by our consultants' comments. We exemplify this in (19a-c).

- (19) a. in the soccer training context (for *PSP in correlatives): “Deniz trained several pupils, this is why the sentence does not fit.”⁵
 b. “Deniz trained several students; (B’) is possible for Ömer and Tahsin, but not for Deniz.”
 c. There are also other girls playing. Correction: “Mine hangi oğlanla oynadıysa, onu yenmiştir.” (‘Whichever boy Mine played with, she beat him.’)
 (This is a comment on the *PSP condition in (15c).)

This is an argument in favor of Hirsch’s and Demirok’s analysis and its application to Turkish: from this analysis, we expect the PSPs of the two constructions to be parallel,⁶ and that does seem to be the case.

4.2. SEMANTICS OF QUESTIONS AND CORRELATIVES. In this section, we bring together an issue left open in the semantic discussion of correlatives above: The role of the matrix clause pronoun, and an empirical finding from our study, namely the increased degradedness of the correlative compared to the question in *PSP contexts. In short, the correlative is more degraded than the question when the injective PSP is not met.

⁵ (19a) and (19b) are comments on the *PSP condition of the following item:

Context: You know that several teachers in your group are great soccer players and that the boys organized individual training sessions with these teachers. You also know that your colleague Deniz trained several students and that Ömer and Tahsin trained one student each, and that the teachers came up with strenuous workouts. You say to your colleague Polina:

- (B’) *Hangi öğretmen hangi öğrenci-yi çalıştır-dı-y-sa, o-nu yor-muş-tur.*
 which teacher which student-ACC train-PST-COP-COND.3SG, he-ACC tire-EV.PFV.-DIR
 Lit.: Which teacher trained which student, he made him tired.
 ‘If a teacher trained a student, he made him tired.’

⁶ To be more precise: the multiple question with the injective PSP forms the antecedent of a conditional, from which PSPs project. The set of alternative conditionals then all share the injective PSP, and when all elements of an alternative set have the same PSP, the set of alternatives has that PSP. This is illustrated in (i).

- (i) a. *Did Bob fail the test again?*
 b. {Bob failed the test again, Bob did not fail the test again}
 c. PSP: Bob had failed the test before.

We follow Demirok (2017a) in analyzing the matrix clause pronoun in a (Turkish) correlative as an E-type pronoun (e.g. Heim 1990; see Demirok 2017a for arguments). The analysis of a pronoun like *she* according to such a view is sketched in (20).

- (20) a. $she = [DP \text{ the } [N \ s]]$
 b. $[[she]] = \text{the unique } x \text{ such that } x \text{ has the relevant property } N \text{ in situation } s$

In correlatives, the personal pronoun occurs in the consequent of a conditional, cf. the semantics in (21). The personal pronouns *she*, *he* in (21a,b) need to be resolved relative to situations which make the antecedent of the conditional true, i.e. situations in which a girl plays a boy.

- (21) a. For all propositions p : $p \in \{\text{if } x \text{ played } y, \text{ then she beat him} \mid \text{girl}(x) \ \& \ \text{boy}(y)\}$
 $\rightarrow p$ is true
 b. all situations s in which x played y are situations in which she beat him
 c. she beat him: the unique girl in s beat the unique boy in s

We propose that situations in which x played y (for a girl x and a boy y) will furnish a unique girl and a unique boy only if each girl plays exactly one boy. Thus, we conjecture that the injective PSP has to be met in order for the E-type pronouns to be well defined. This would mean that while in both question and correlative, the injective PSP is present as a PSP of the multiple interrogative, in the correlative it is more prominent because without it the derivation of the appropriate semantics of the E-type pronoun will fail. This connection would explain our data.⁷

We further propose the crosslinguistic hypothesis in (22) to be tested against further languages. For German, the hypothesis leads us to expect - correctly - the absence of multiple correlatives.

- (22) Multiple interrogative-based correlatives are only acceptable in languages that
 (i) have multiple questions and
 (ii) in which those questions have the injective PSP.

⁷ The informed reader will no doubt be skeptical of this proposal in view of ordinary conditionals like (ia). (ia) does not presuppose (ib). An analysis of (ia) in terms of E-type pronouns is sketched in (ic) (von Stechow 1994).

- (i) a. *If a girl plays a boy, she beats him.*
 b. Each girl plays exactly one boy.
 c. All minimal situations s in which a girl plays a boy can be extended to situations s' in which the girl in s beats the boy in s .

The requirement that the antecedent situations be minimal allows a girl to play more than one boy (or, more classically, a farmer to own more than one donkey), while the E-type pronouns still find a unique referent. We acknowledge this point and in response, can only point out that there is an interesting issue concerning the scope of the minimality requirement in our data with questions in the antecedent. A more spelled out version of the set of conditionals in (21) is given in (ii).

- (ii) $\{\text{all minimal situations } s \text{ in which } x \text{ plays } y \text{ can be extended to situations } s' \text{ in which the girl in } s \text{ beats the boy in } s \mid \text{girl}(x) \ \& \ \text{boy}(y)\}$

Because of their alternative semantics, the restrictors of the two *wh*-phrases (*girl* and *boy* in the example) constrain the set of alternatives (e.g. Kotek 2016, 2-19). In our example, the restrictors do not form part of the antecedent of the conditional. This, we conjecture, makes a difference in terms of finding a situation in which there is a unique girl and a unique boy as referents of the matrix clause pronouns. In contexts like (11a,b), minimal playing situations (involving a girl and a boy) guarantee that the uniqueness requirements are met. In contexts like (11c), a minimal playing situation (involving a girl and a boy) seems to be insufficient for providing two unique referents.

While we do not spell out the details, we hope that this difference between our data and ordinary conditionals will help preserve the intuitive appeal of our proposal in the main text.

Our paper leads to a larger research question: Which language has a presuppositional multiple question and where does this PSP come from? The question invites systematic crosslinguistic investigation.

A further prerequisite is choice of the right pronoun. Not all pronouns in a given language might permit an E-type analysis. As a case in point, consider Russian. In Russian correlatives, there is the “demonstrative requirement” (Mitrenina 2010: 140), i.e. the demonstrative is obligatory in the main clause (i.e. consequent) of the correlative as shown by the minimal pair in example (23):

- (23) a. *Kakuju emu dajut, takuju pišču on i est.*
 which.ACC.F him give.3SG.PL that.DEM.F food.ACC he EMPH eat.3SG⁸
 Lit.: ‘Which (food) they give him, that food he eats.’
 ‘He eats whatever food is given to him.’
 b. **Kakuju emu dajut, pišču on i est.*
 which.ACC.F him give.3SG.PL food.ACC he EMPH eat.3SG

(Mitrenina 2010: 140)

What is more, according to introspective intuition of one of the authors, the demonstrative pronoun is the only option for (multiple correlatives). The option with the personal pronoun in (24b) is at least questionable.

- (24) a. *Kakaja devochka s kakim mal’chik-om sygraet,*
 which.F girl with which.M.INS boy-INS play.3SG.FUT.PFV
ta togo i obygraet.
 that.DEM.F that.DEM.M.ACC EMPH outplay.3SG.FUT. PFV
 Lit.: ‘Which girl will play with which boy, she will outplay him.’
 b. ??*Kakaja devochka s kakim mal’chik-om sygraet,*
 which.F girl with which.M.INS boy-INS play.3SG.FUT.PFV
ona ego i obygraet.
 she him EMPH outplay.3SG.FUT.PFV

Summarizing, only deictic pronouns can be used in Russian correlatives. Taking these demonstrative pronouns to be E-type pronouns, this also nicely fits into Demirok’s analysis for correlatives.

4.3. BILINGUAL GRAMMAR. What is then, ultimately, the crucial difference between the grammars of the correlative in German vs. Turkish? Looking at Figure 3 again, especially at the side of the bilinguals where we see a significant difference between the appropriateness of the correlative as compared to the question (irrespective of the context, i.e. single-pair, pair-list or *PSP), we suggest that the difference between German and Turkish is the existence of the injective PSP in Turkish and the absence of such a PSP in German for the multiple question (in line with (22)).

This brings us back to the source of this PSP in multiple questions. We noted above that Kotek (2016, 2019) holds a question operator responsible for this PSP. If this is right, then some languages would have such a presuppositional question operator, while others would lack it. Conceivably, the grammar without the relevant operator is simpler. Thus our results are compatible with Scontras et al.’s (2017) proposal that the simpler system is chosen in bilingual grammar.

⁸ The glossing has been slightly changed from Mitrenina’s original example.

5. Conclusions. Our study has established that Turkish multiple questions and correlatives have the injective PSP familiar from the literature on English and Hindi. Given the plausibility of crosslinguistic variation in this area, this is a non-trivial result. The alignment of question and correlative is equally significant, since it supports the question-based analyses of Hirsch and Demirok.

The need of further crosslinguistic work in this domain emerges from the study. So far, there seems to be little systematic empirical work on the injective PSP. Similarly, the source of the PSP should be investigated further, especially in view of its variability.

Perhaps the most striking result of our study is the difference between monolingual and bilingual speakers. With Turkish and German, we have two languages that contrast in the grammatical domain that we tested. This contrast could plausibly be behind the difference between monolingual and bilingual judgments. Our data are compatible with the simpler grammar hypothesis of Scontras et al. (2017), but more work needs to be done.

We are convinced that bilingual grammar merits specific attention and investigation in generative grammar, and in particular, the semantics-pragmatics interface. The present study shows that the crosslinguistic contrast informs our investigation of bilingual grammar, while bilingual grammar contributes new insights for theory building.

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