

Intervention Obviation by Pied-piping in Turkish*

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ABSTRACT: Even in wh-in-situ languages like Turkish, there are configurations where a wh-phrase fails to take scope in-situ above another scopal element (such as negative concord items). These configurations known as intervention configurations can be obviated via overt movement of the wh-phrase to the left of the element causing the uninterpretability. In this study, I document cases where such overt movement of the wh-phrase (optionally or necessarily) pied-pipes a larger constituent it is part of. Adopting a compositional semantics for interpreting pied-piping structures, I argue that pied-piping is a general mechanism for exceptional scope, compositionally implementing earlier insights in the syntax literature.

Keywords: intervention, pied-piping, wh-questions, Turkish, scope

Türkçede Sürüklemeli Ne-taşıma ile Yorumlanamazlıktan Kaçınma

ÖZ: Türkçe gibi tipik ne-taşıma işlemi göstermeyen dillerde dahi, bir ne-öbeğinin (olumsuz uyum ögesi gibi) başka bir açısız ögeye göre geniş açılı almasının mümkün olmadığı durumlar vardır. Arayagirme olarak adlandırabileceğimiz bu durumlardan ne-öbeğinin yapıyı yorumlanamaz kılan ögenin soluna taşınması ile kaçınılabilmektedir. Bu çalışmada, bu tür ne-taşıma işlemlerinde, ne-öbeğinin parçası olduğu daha büyük bir ögeyi (seçimli ya da zorunlu olarak) peşinden

* This work is based on my dissertation (Demirok, 2019), where the compositional semantics adopted in this work for interpreting pied-piping structures was proposed. Heartfelt thanks to the two reviewers for their insightful feedback. All errors are mine.



sürüklediđi durumlar incelenmektedir. Peřinden sürükleme yapılarını yorumlamayı sađlayan bir bileřimsel anlam çözümlemesi yöntemi kullanılarak, daha önce sözdizim alanyazınından önerilen görüřlerin ışığında, sürüklemenin kuraldışı geniş açının üretimini sađlayan bir bileřimsel yöntem olduđu savunulacaktır.

Anahtar sözcükler: arayagirme, peřinden sürükleme, ne-soruları, Türkçe, aç

1 Introduction

The terms *intervention* or *intervention effects* have been used to describe several distinct phenomena in natural language (Mayr, 2020). One of the well-documented phenomena that this term has been used to describe is the inability of in-situ wh-phrases to take scope above a class of expressions known as *interveners* (Hoji, 1985; Beck, 1996; Beck and Kim, 1997; Pesetsky, 2000; Beck, 2006; a. o.). This class of intervention effects, specifically referred to as *Beck effects* in Mayr (2020), was documented also in Turkish (Beck & Kim, 1997, Keleşir 2001) and was later surveyed in Kesen (2010).

The sentences in (1) illustrate the phenomenon of intervention effect, which is the varying degrees of degradedness/uninterpretability that speakers report for the intended question interpretation in the presence of a linearly preceding/c-commanding intervener. As shown in (1), the negative concord item (NCI) *hiçbir* ‘no/any’ and *sadece* ‘only’ are interveners in Turkish, as is typically the case in languages with well-documented intervention/Beck effects such as Korean (Beck 2006).

- (1) a. ??Hiçbir davetli **hangi** yemek-ten ye-me-di?
 No guest which dish-ABL eat-NEG-PST
 Int. ‘Which dish is such that no guest ate from it?’
- b. ??Sadece Zeynep **hangi** ders-i geç-ti?
 only Zeynep which course-ACC pass-PST
 Int. ‘Which course is such that only Zeynep passed it?’

Importantly, intervention can be obviated by overt movement of the wh-phrase past the intervener, as shown in (2a) for (1a) and (2b) for (1b).

- (2) a. [Hangi yemekten]₂ hiçbir davetli t₂ yemedi?
 ‘Which dish is such that no guest ate from it?’

- b. [Hangi dersi]₂ sadece Zeynep t₂ geçti?
‘Which course is such that only Zeynep passed it?’

It is straightforward to show that the intervention effect under discussion is really about the interaction between wh-phrases and interveners. Needless to say, in the absence of an intervener, there is no independent requirement for the wh-phrase to be sentence-initial in Turkish, as shown in (3a). Likewise, in the absence of a wh-phrase, there is no independent requirement for an NCI to be immediately preverbal, as shown (3b).

- (3) a. Zeynep **hangi yemek-ten** ye-me-di?
Zeynep which dish-ABL eat-NEG-PST
‘Which dish did Zeynep not eat from?’
- b. **Hiçbir davetli** fasülye-den ye-me-di.
no guest beans-ABL eat-NEG-PST
‘No guest ate from the beans.’

Furthermore, intervention is not just a matrix-level phenomenon or a phenomenon that concerns matrix scope wh-phrases, for it can also be observed in embedded wh-questions. As shown in (4a), the NCI indirect object preceding the embedded scope direct object wh-phrase leads to intervention. However, overt movement of the wh-phrase to the left of the intervener restores interpretability, as shown in (4b).¹

- (4) a. ??[hiçbir davetliye hangi yemekten
no guest.DAT which dish.ABL
vermediklerini] söyle-r mi-sin bana?
give.NEG.NMLZ.POS.3PL.ACC tell-AOR Q-2SG me
Int. ‘Can you tell me which dish they served to no guest?’
[Context: I manage the kitchen at a big hotel, which has recently hosted a big event with hundreds of guests. I discover that one of the dishes has not been served to the guests at all. I ask a waiter to find out:]

¹ The matrix sentence is given as a polar question for better pragmatic grounding. The same intervention effect would also be present in the following declarative utterance: ??*hiçbir davetliye hangi yemekten vermediklerini söyledim sana*. Int. ‘I told you which dish they served to no guest.’. The intervention effect again disappears if the embedded scope wh-phrase is moved to the left of the NCI: *hangi yemekten hiçbir davetliye vermediklerini söyledim sana*.

- b. [hangi yemekten]₂ hiçbir davetliye t₂ vermediklerini söyler misin bana?
‘Can you tell me which dish they served to no guest?’

The data above should suffice to show that the intervention effect is the failure of an in-situ wh-phrase to extend its scope beyond an intervener without overtly moving to a position above it. In all configurations, the intervention can be obviated by overt movement of the wh-phrase past the intervener.

The empirical focus in this work will be on configurations where intervention obviation requires an instance of movement that optionally or obligatorily involves **pied-piping** of a larger constituent containing the wh-phrase. Pied-piping for intervention obviation was first noted in Demirok (2021). In (5a), where there is an intervention effect, the intervener *sadece Pelin* ‘only Pelin’ is the subject of the matrix clause while the wh-phrase is embedded within a relative clause, a domain known to be an extraction island cross-linguistically as well as in Turkish (Kornfilt, 2008; Çakır, 2015, 2016). Preposing the object containing the wh-phrase past the subject obviates the intervention effect, restoring interpretability, as shown in (5b). If obviation by pied-piping were not possible, the sentence would remain degraded because the wh-phrase could not be moved without pied-piping the island it is part of, as shown in (5c).

- (5) a. *Sadece Pelin [_{island} kimden gel-en hediyeyi]
only Pelin who.ABL come-REL gift.ACC
beğendi?
like-PST
Int. ‘Who is such that only Pelin liked the gift that came from them?’
- b. [_{island} kimden gel-en hediyeyi]₂ sadece Pelin t₂ beğendi?
‘Who is such that only Pelin liked the gift that came from them?’
(Demirok 2021:99)
- c. ***Kimden**₂ sadece Pelin [_{island} t₂ gel-en hediyeyi] beğendi?

As argued in Demirok (2021), intervention is not merely an ordering restriction between a class of elements and wh-phrases but rather it is the failure to take the intended scope in the pronunciation position.

As is well-known, *söyle* ‘tell’ takes both declarative and question complements. Accordingly, the wh-phrase in (6) can take narrow scope or wide scope, yielding embedded (i) or matrix (ii) question construals.

- (6) Murat sana [Zeynep'in hangi ders-ten
Murat you Zeynep-GEN which course-ABL
kaldığını] söyle-di./?
fail.NMLZ.POS.3SG.ACC say-NEG-PST
(i) 'Murat told you which course Zeynep failed.'
(ii) 'Which course did Murat tell you Zeynep failed?'

Importantly, in the same configuration where the matrix subject is replaced by an intervener as in (7), the matrix scope for the wh-phrase becomes unavailable, hence we have an intervention effect. However, the same string does allow narrow scope construal for the wh-phrase precisely because under this construal we are not trying to scope the wh-phrase above the NCI.²

- (7) Hiçkimse sana [Zeynep'in hangi ders-ten
nobody me Zeynep-GEN which course-ABL
kaldığını] söyle-me-di.
fail.NMLZ.POS.3SG.ACC think-NEG-PST
(i) Available: 'Nobody told you which course Zeynep failed.'
(ii) Unavailable: 'Which course is such that nobody told you Zeynep failed it?'

As shown in (8), the wh-phrase pied-piping the embedded clause past the intervener restores interpretability for the matrix wh-question construal.³

- (8) [Zeynep'in hangi ders-ten kaldığını]₂ hiçkimse sana t₂ söyle-me-di?
'Which course is such that nobody told you Zeynep failed it?'

² A reviewer points out it is unclear if the intervention effect is due to the NPI remaining unlicensed or the wh-phrase failing to take in situ scope above it. Both of these are descriptively correct, albeit Beck-type intervention effects under discussion are not limited to NPIs, as was shown above. What is more important, however, is the fact that the effect is obviated by overt movement. Hence, regardless of how the source of the effect is described, we only get to observe it because crucially grammar limits how surface order in syntax can be mapped to scopal relations in semantics.

³ As rightly pointed out by a reviewer, the embedded question construal is available for this string under the declarative prosody. Notably, the scrambling of the embedded clause in this instance would be plain object fronting, rather than an instance of pied-piping driven by a need to alter scopal relations. As will become clear in Section 4, pied-piping will require a particular type of LF, not employed in instances of movement that do not involve pied-piping.

The paper is structured as follows. Section 2 takes the observation in Demirok (2021) as its starting point and further documents the empirical basis for intervention obviation by pied-piping in Turkish. Section 3 makes a case for interpreting pied-piping. Section 4 presents an analysis adapting the compositional semantics proposed in Demirok (2019) for interpreting pied-piping structures. Section 5 concludes.

2 When do we see pied-piping for intervention obviation?

The aim in this section is to show that pied-piping is used for intervention obviation in Turkish not only in cases where it is the only option available but also in cases where it is an alternative to extraction, in fact often a better one⁴.

One of the cases where pied-piping is possible is the genitive-possessor constructions where the possessor is the *wh*-phrase. The baseline sentence where the intervention effect is present is given in (9a). The optionality in how the effect is to be obviated is between the possessor moving alone as in (9b) or pied-piping the possessee along with it as in (9c). It seems that extraction is dispreferred and requires a prosodic break (indicated by '|') between the extracted possessor and the subject NCI.

- (9) a. ??Hiçkimse hangi şarkıcı-nın yeni album-ün-ü
 nobody which singer-GEN new album-POS.3SG-ACC
 beğen-me-miş?
 like-NEG-EVID
 Int. 'Which singer₁ is such that nobody liked their₁ new album?'
- b. [hangi şarkıcının]₂ | hiçkimse t₂ yeni albümünü beğenmemiş?
- c. [hangi şarkıcının yeni albümünü]₂ hiçkimse t₂ beğenmemiş?
 'Which singer₁ is such that nobody liked their₁ new album?'

This optionality between extraction and pied-piping extends to nominalizations whose subjects are genitive. This is true both for genitive subjects of -*mA* nominalizations as shown in (10) and genitive subjects of -*DİK* nominalizations as shown in (11).

⁴ I first discussed the data reported here in LING 314, Syntax and Semantics of Modern Turkish, in Spring 2025 at Boğaziçi University. I thank the students enrolled in the course for sharing their acceptability judgments in class, especially Can Erden, who conducted additional data collection during the same semester.

- (10) a. ??Hiçbir öğretmen hangi kız-ın ders-ten
 no teacher which girl-GEN course-ABL
 kal-ma-sın-ı iste-m-iyor?
 fail-NMLZ-POS.3SG-ACC want-NEG-IMPF
 Int. ‘Which girl₁ is such that no teacher wants her₁ to fail the course?’

b. [hangi kızın]₂ | hiçbir öğretmen t₂ dersten kalmasını istemiyor?

c. [hangi kızın dersten kalmasını]₂ | hiçbir öğretmen t₂ istemiyor?
 ‘Which girl₁ is such that no teacher wants her₁ to fail the course?’

- (11) a. ??Hiçbir öğretmen hangi kız-ın ders-ten
 No teacher which girl-GEN course-ABL
 kal-dığ-ın-ı bil-m-iyor?
 fail-NMLZ-POS.3SG-ACC know-NEG-IMPF
 Int. ‘Which girl₁ is such that no teacher knows she₁ failed the course?’

b. [hangi kızın]₂ | hiçbir öğretmen t₂ dersten kaldığını bilmiyor?

c. [hangi kızın dersten kaldığını]₂ | hiçbir öğretmen t₂ bilmiyor?
 ‘Which girl₁ is such that no teacher knows she₁ failed the course?’

Speakers also accept the possibility to extract a non-subject out of nominalizations. However, non-subject extraction out of -DIK nominalizations is only a marginal possibility for many speakers. Regardless of the possibility of extraction, all speakers find pied-piping markedly more natural and acceptable, as shown in (12c) and (32c).

- (12) a. ??Hiçbir öğretmen hangi kız-a yardım
 no teacher which girl-GEN help
 et-me-m-i iste-m-iyor?
 LV-NMLZ-POS-1SG-ACC want-NEG-IMPF
 Int. ‘Which girl₁ is such that no teacher wants me to help her₁?’

b. [hangi kıza]₂ | hiçbir öğretmen t₂ yardım etmemi istemiyor?

c. [hangi kıza yardım etmemi]₂ | hiçbir öğretmen t₂ istemiyor?
 ‘Which girl₁ is such that no teacher wants me to help her₁?’

- (13) a. ??Hiçbir öğretmen hangi kız-a yardım
 no teacher which girl-GEN help
 et-tiğ-im-i bil-m-iyor?
 LV-NMLZ-POS-1SG-ACC know-NEG-IMPF
 Int. ‘Which girl₁ is such that no teacher knows I help her₁?’
- b. ?[hangi kıza]₂ | hiçbir öğretmen t₂ yardım ettiğimi bimiyor?
- c. [hangi kıza yardım ettiğimi]₂ | hiçbir öğretmen t₂ bilmiyor?
 ‘Which girl₁ is such that no teacher knows I help her₁?’

What is crucial for our purposes is that in all of these cases, pied-piping *is* possible and appears to be an unmarked option for intervention obviation, often judged better than extraction of the wh-phrase itself.

Let us conclude this section with a further illustration of the cases where the wh-phrase is contained in an island. As was also shown in (5), pied-piping of the island comes out as the only option when the wh-phrase is trapped in an extraction island, as shown in (14).

- (14) a. ??Hiçkimse seni hangi kız-a yardım
 nobody you-ACC which girl-DAT help
 et-me-n-e rağmen öv-me-di?
 LV-NMLZ-POS-2SG-ACC despite praise-NEG-PST
 Int. ‘Which girl₁ is s.t. nobody praised you although you help her₁?’
- b. *[hangi kıza]₂ | hiçkimse seni t₂ yardım etmene rağmen övmedi?
- c. [hangi kıza yardım etmene rağmen] hiçkimse seni övmedi?
 ‘Which girl₁ is such that nobody praised you because you help her₁?’

In the next section, we turn to the motivation for taking pied-piping as a mechanism for scope in natural language.

3 A case for pied-piping

Under an influential semantics of wh-questions (Hamblin, 1973; Karttunen, 1977), wh-questions denote sets of propositions, i.e., the set of possible answers to the question. A widely known and adopted method of generating question meanings involves movement of the wh-phrase to a scope position in the periphery of the clause (Heim 2000, Fox 2012, Dayal 2016). This is in essence a type of quantifier movement that carries the wh-phrase to its scope position but it is more commonly referred to as wh-movement in the syntax literature. While

many languages require such a movement overtly, many others exhibit wh-in-situ syntax and furthermore island-insensitivity in their wh-questions (Cheng 2003). Given this latter group of languages, movement-free alternatives, namely in-situ methods of generating question meanings, have also been proposed. These methods that do not involve movement for wh-scope include *choice functions* (Reinhart 1997, 1998) and *pointwise composition* (Shimoyama 2006, Cable 2010). Furthermore, to deal with the island-insensitivity property of wh-in-situ, approaches defending the traditional movement-based approaches to wh-scope argued that wh-phrases within islands trigger pied-piping of the islands, albeit covertly (e.g., Richards 2000). Much work on Turkish wh-questions also focused on the island-insensitivity property and defended various proposals for dealing with the wh-in-situ property (Akar 1990, Özsoy 1996, Arslan 1999, Görgülü 2006, Kornfilt 2008, İşsever 2009, Çakır 2015, 2016, Atlamaz 2023). We can in particular single out Özsoy (1996), as it was a proposal defending pied-piping for island-violating wh-scope in Turkish.

Coming back to the covert island pied-piping proposal, which has received less attention in the syntax literature than movement-free alternatives, there was, in addition a criticism offered from a compositional semantics point of view. Von Stechow (1996) argued that pied-piping cannot generate the correct interpretation of wh-questions. To illustrate, he argued that for (15) to be true, in other words, to be able to say Mary knows the answer to the question of which girl's cat Bill fed, it does not suffice for Mary to know which cat (owned by a girl) Bill fed. Rather, she needs to know which girl is such that Bill fed her cat. Suppose Bill indeed fed Milo, which happens to be Susan's cat. Then, von Stechow's empirical claim is that if Mary merely knows that Bill fed Milo but does not know that Milo is Susan's cat, (15) is judged false.

- (15) Mary knows which girl's cat Bill fed.
- a. = Mary knows the answer to the question
which girl x is such that Bill fed x 's cat.
 - b. \neq Mary knows the answer to the question
which cat x is such that Bill fed x .

For von Stechow, insisting on interpreting pied-piping meant that what is in the scope position (i.e., *which girl's cat*) is larger than the wh-phrase (i.e., *which girl*) and that this leads to the incorrect meaning in (15b) rather than the correct meaning in (15a). Accordingly, if English displayed overtly what the correct Logical Form (LF) would look like, the sentence in (18) would have been pronounced as in (16).

(16) Mary knows which girl Bill fed _'s cat.

Nevertheless, more recent work in compositional semantics (Demirok 2019, Charlow 2020) has shown that there is a way to derive the correct meaning of wh-questions that involve pied-piping, as long as the compositional machinery ensures the semantic reconstruction of what is being pied-piped (i.e., the pied-pipee).

As was documented in the previous section, even in Turkish, a language where wh-movement in the traditional sense is not observed, pied-piping emerges as an unmarked option for intervention obviation. When a wh-phrase is embedded within a larger constituent that an intervener c-commands, the intended wh-scope can be attained via the wh-phrase pied-piping the larger constituent it is part of (e.g., a clause or an island). While languages like English exhibit pied-piping to a certain degree in their wh-questions, others such as Finnish and Basque, which are both overt wh-movement languages, exhibit overt clause/island pied-piping of the kind we have seen in Turkish, as shown in (17) and (18), respectively.⁵

(17) [kenelle kirjoitetun kirjeen]_i Pekka luki t_i?
 who.ALL written.PTCP letter.ACC Pekka read
 Lit. [the letter written to whom]_i, did Pekka read?⁶
 (Finnish, Huhmarniemi 2010:18)

(18) [Nork edan duela ura]_i
 who.ERG drink AUX.COMP water.ABS
 esan du Jonek t_i?
 say AUX Jon.ERG
 Lit: [Who drank water] did John say t?
 'Who did John say drank water?'
 (Basque, Duguine & Irurtzun 2014)

Given that pied-piping is a well-attested natural language phenomenon, natural language semantics surely needs to have a way of interpreting strings resulting from pied-piping. This naturally opens up the possibility that pied-piping is itself a mechanism for scope. The goal of the next section is to present a specific implementation of this general idea.

⁵ According to the cited sources, while wh-extraction without clausal pied-piping is also possible in Basque, island pied-piping is the only option in Finnish. This state of affairs is similar to our findings for Turkish.

⁶ The Turkish counterpart would be: "Pekka kime yazılan mektubu okudu?".

4 Pied-piping for scope

I assume that scope-taking requires the syntactic manipulation canonically referred to as movement, which is interpreted at LF as *lambda abstraction* (i.e., an operator-variable binding relation) (Heim and Kratzer 1998, von Stechow and Heim 2011).

This general framework crucially involves wh-scope, too. Accordingly, wh-phrases are scope-takers like other quantifiers. This is clearly evidenced by their inability to take scope in-situ when under a so-called intervener while having no problem under an element such as a referring expression that does not enter the scope calculus, as shown in (19).

- (19) a. ??Hiçbir öğrenci hangi soru-yu boş bırak-ma-mış?
 no student which question-ACC blank leave-NEG-EVID
 Int. ‘Which question is such that no student left it unanswered?’
 a'. [hangi soruyu]₂ hiçbir öğrenci t₂ boş bırakmamış?
- b. Mustafa hangi soru-yu boş bırak-ma-mış?
 Mustafa which question-ACC blank leave-NEG-EVID
 ‘Which question is such that Mustafa did not leave it unanswered?’

Hence, even though Turkish does not exhibit the wh-movement of the familiar kind we see in English (i.e., one that is triggered by a formal feature), wh-phrases overtly move above other scopal elements when they need to scope above them. This is precisely the behavior we see with quantifier scope in Turkish, where the order of the quantifiers determines their relative semantic scope. This is the phenomenon known as *scope rigidity* (Göksel 1998, Keleşir 2001, Özyıldız 2017, Demirok 2021). It has been argued that strong indefinites in Turkish may constitute an exception to this pattern (Keleşir 2001). However, I argue that even this seemingly exceptional class of scope-takers are not so different from wh-phrases and are in fact subject to scope rigidity.

Consider as a baseline the sentence in (20c) where the indefinite object is able to scope above negation in-situ (i.e., in its canonical object position preceding the verb). However, when an NCI subject that needs to be in the scope of negation precedes a strong indefinite, the indefinite cannot scope above negation in-situ, as shown in (20a). Rather, it needs to be overtly moved to a position higher than the NCI, as shown in (20b). Needless to say, this is enforced by scope rigidity: there is apparently no LF that is compliant with the word order of (20a) where the indefinite is above negation while the NCI that it precedes is below negation. The pattern of obviation we see in (20b) is analogous to the obviation of intervention effects we observe with wh-phrases, which can likewise only be obviated by overt movement of the wh-phrase to its intended scope position.

- (20) a. ??Hiçbir öğrenci bir soru-yu boş bırak-ma-mış.
 no student a question-ACC blank leave-NEG-EVID
 Int. ‘There is a question such that no student left it unanswered.’
 (...namely, the 7th question on the test.)
- b. [bir soruyu]₂ hiçbir öğrenci t₂ boş bırakmamış.
- c. Mustafa bir soru-yu boş bırak-ma-mış.
 Mustafa a question-ACC blank leave-NEG-EVID
 ‘A question is such that Mustafa did not leave it unanswered.’

Leaving the investigation of indefinites to a future occasion, I proceed to the main discussion intended for this section. How do we interpret pied-piping structures under the assumption that wh-phrases are scope-takers?

First, I briefly review the semantics of wh-questions and show how wh-question meanings are generated compositionally. Then, I go on to demonstrate the syntax of pied-piping and demonstrate how the pieces used to build question meanings can help us model pied-piping as a mechanism that delivers scope.

4.1 Generating question meanings

I assume the most widely known semantics of wh-questions, where questions are proposition sets (Hamblin 1973, Karttunen 1977). Accordingly, uttered in a context where {Buse, Kazım, Selin} is the set of students that were enrolled in LING 305, the question in (21a) informally denotes the set of propositions in (21b).

- (21) a. Which students passed LING 305?
 b. = {Buse passed LING 305,
 Kazım passed LING 305,
 Selin passed LING 305}

Under the function representation of this meaning, (24a) denotes the function in (22), which is the characteristic function of the set of propositions in (21b). This is a function of type $\langle\langle s, t \rangle, t \rangle$ (i.e., functions from functions of type $\langle s, t \rangle$ (proposition) to type t (truth-value)).

- (22) $\lambda p_{\langle s, t \rangle} . \exists y: y \in \{\text{Buse, Selin, Kazım}\} \ \& \ p = \lambda w. y \text{ passed LING305 in } w$

As briefly reviewed in the previous section, there are various compositional mechanisms that allow us to generate question meanings. I will be adopting the analysis where the wh-phrase is a quantifier that scopes above the question

nucleus (Heim 2000, Fox 2012, Dayal 2016). In particular, there will be three pieces that will occur in the LF of any wh-question: a wh-phrase, and two phonetically null morphemes: IDENT and OP.

The IDENT morpheme is essentially a set-builder. In the mixed set-function notation, it denotes the function $\lambda p_{\langle s,t \rangle} . \{p\}$ that applies to a proposition and returns the set that contains it, as illustrated in (23).

$$(23) \ || \ [\ IDENT \ [John \ smokes] \] \ || = \\ \ [\lambda p_{\langle s,t \rangle} . \{p\}] \ (||John \ smokes||) = \{\lambda w. \text{John smokes in } w\}.$$

Hence, in the more precise representation that does not mix in the set-notation, IDENT denotes the function in (24).

$$(24) \ ||IDENT|| = \lambda p_{\langle s,t \rangle} . \lambda q_{\langle s,t \rangle} . q=p$$

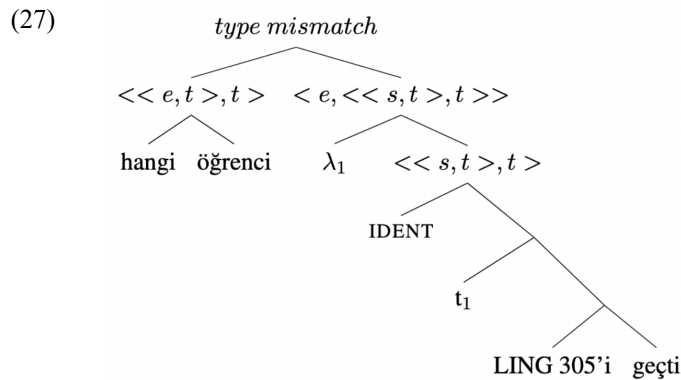
As illustrated in (25), the combination of IDENT with the sentence *John smokes* outputs the characteristic function of the set in (23).

$$(25) \ || \ [\ IDENT \ [John \ smokes] \] \ || = \lambda p_{\langle s,t \rangle} . p = \lambda w. \text{John smokes in } w$$

I assume along with earlier work that wh-phrases are existential quantifiers and have denotations as in (26). Being quantifiers, they move and take scope above IDENT.

$$(26) \ ||hangi \ öğrenci||^w = \lambda P_{\langle e,t \rangle} . \exists x: ||öğrenci||^w(x) \ \& \ P(x)$$

This movement, however, results in a type mismatch because the lambda abstract that this movement creates is a function of type $\langle e, \langle \langle s,t \rangle, t \rangle \rangle$ (i.e., functions from individuals of type e to functions of type $\langle \langle s,t \rangle, t \rangle$) whereas the wh-phrase is of type $\langle \langle e,t \rangle, t \rangle$. This is illustrated in (27) below.

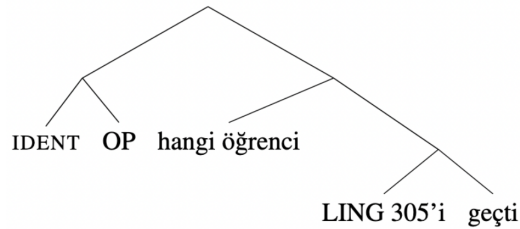


To maintain this simple existential quantifier denotation for the wh-phrase, a technical solution that creates a node of type t above IDENT has been proposed in earlier work (Heim 2000, Fox 2012, Dayal 2016), which I adapt following Demirok (2019). To implement this proposal, I will be making use of the ingredient that I call OP, which is simply an operator to induce lambda abstraction and denotes a type-neutral identity function, as defined in (28).

$$(28) \llbracket \text{OP} \rrbracket = \lambda R. R$$

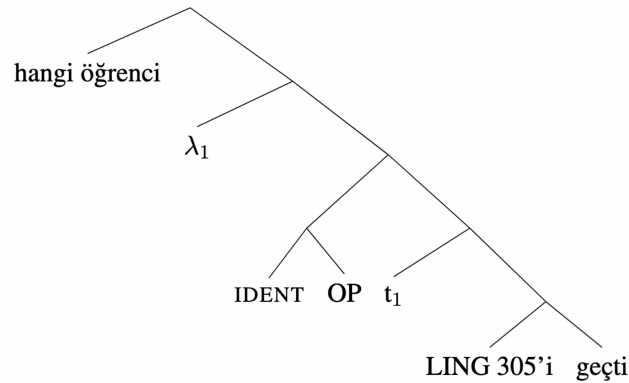
I assume that whenever a wh-question is to be built, IDENT and OP are merged together as sisters above the question nucleus, as shown in (29).

(29)



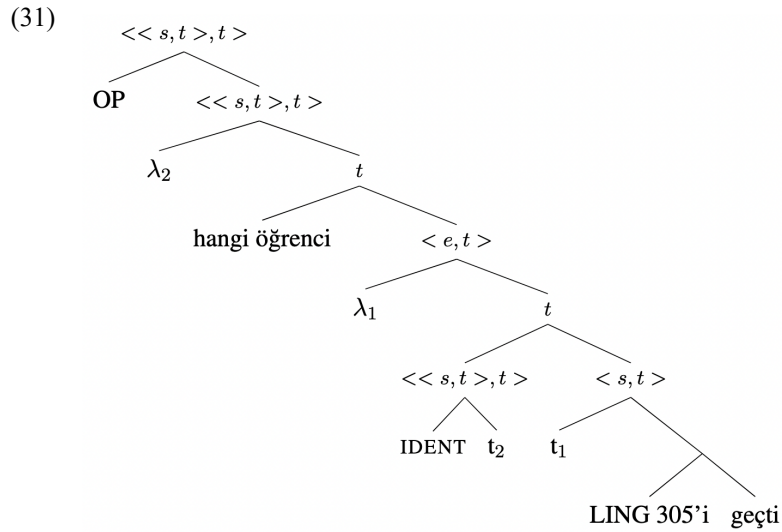
This structure is still not a question. The wh-phrase has to move and scope above IDENT to create a question meaning. So, that is the next step in the derivation.

(30)



The LF in (30) still has a type mismatch. The OP denotes a type-neutral identity function and is in principle semantically vacuous. This results in the lambda abstract denoting a function of type $\langle e, \langle \langle s, t \rangle, t \rangle \rangle$, which the wh-phrase cannot combine with. However, the subsequent movement of OP, as shown in (31), is

able to fix the type mismatch. In particular, this is possible if the trace of OP is interpreted as having type $\langle s, t \rangle$, which in turn ensures that the sister of the wh-phrase denotes a function of type $\langle e, t \rangle$, a function of the right type for it to combine with.⁷



The resulting LF has no type mismatch and is interpretable, as shown in (31). The denotation that is derived from this LF is provided in (32), which is the desired meaning for the given wh-question.

(32) $\| (31) \|^w =$
 $\lambda p_{\langle s, t \rangle} . \exists y: y \text{ is a student in } w \ \& \ p = \lambda w'. y \text{ passed LING305 in } w'$

Next, we turn to the mechanics of pied-piping.

4.2 Interpreting pied-piping structures

The core insight in Demirok (2019), which reworks the cyclic scope-taking system first proposed in Charlow (2020), is that pied-piping involves two instances of scope-taking. When a wh-phrase pied-pipes the XP it is part of, XP

⁷ Strictly speaking, the OP being a type-neutral identity function does not have to leave a trace of type $\langle s, t \rangle$. However, the trace of the OP being type $\langle s, t \rangle$ is the only one that allows for the derivation to proceed without a type-mismatch. As will be shown in Section 4.2., when the pied-pipee is not a clause, this flexibility will prove to be useful.

is syntactically lifted into an existential quantifier and takes scope via movement (i.e., quantifier raising). Furthermore, the *wh*-phrase also takes scope via movement to the edge of the phrase it pied-pipes. For this system to work, the only additional ingredient (besides the ones used in composing questions) that allows pied-piping to be interpretable is a null \exists morpheme, a type-neutral version of the *wh*-determiner *which*. For that reason, Demirok (2019) refers to this version of cyclic scope-taking as the \exists -theory of pied-piping.

Before we see the mechanics of the \exists -theory of pied-piping, let us consider the data in (33) from Finnish. The example in (33a) is the baseline, reflecting the basic constituent order in Finnish. Finnish being an SVO language, the object *Merja* within the clausal adjunct island follows the verb. However, when the object within the clausal adjunct island is replaced by a *wh*-phrase, the only way to form an information-seeking, run-of-the-mill *wh*-question (rather than an echo-question) is to move the *wh*-phrase to the edge of the adjunct island and subsequently move the island to the clause-initial position, as shown in (33b).

- (33) a. Pekka katkaisi puhelun
 Pekka disconnected call.ACC
 [island soittaessaan Merjalle]
 call.ESSA.PRS.PX.3SG Merja.ALL
 ‘Pekka disconnected when he was calling Merja.’
- b. [island **Kenelle** soittaessaan **t₁**]₂
 who.ALL call. ESSA.PRS.PX.3SG
 Pekka katkaisi puhelun **t₂**
 Pekka disconnected call.ACC
 Lit. ‘Who is such that Pekka disconnected when he was calling them?’
 (Finnish, Huhmarniemi 2012:358)

As mentioned above, the \exists -theory of pied-piping that I adopt from Demirok (2019) models pied-piping via the morphemes used to build questions (namely the set-builder morpheme IDENT, and OP) with the addition of a morpheme that is going to be referred to as \exists . The \exists morpheme, whose denotation is given in (34), is the type-neutral version of the *wh*-determiner *which*, as mentioned above.

$$(34) \|\exists\| = \lambda R. \lambda P. \exists Y: R(Y) \ \& \ P(Y)$$

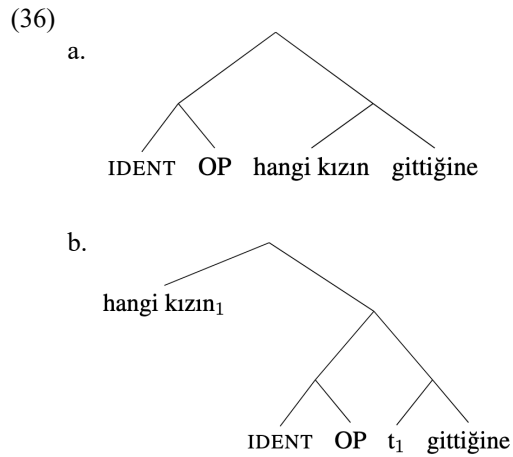
Let us see the main derivational steps in the derivation of the overt pied-piping example in (35b).

- (35) a. ??Hiçkimse [hangi kızın
 Nobody which girl-GEN
 git-tiğ-in-e] inan-ma-dı?
 go.NMLZ.POS.3SG.DAT believe-NEG-PST
 Int. ‘Which girl is such that nobody believed she left?’

- b. [hangi kızın gittiğine] hiçkimse inan-ma-dı?
 ‘Which girl is such that nobody believed she left?’

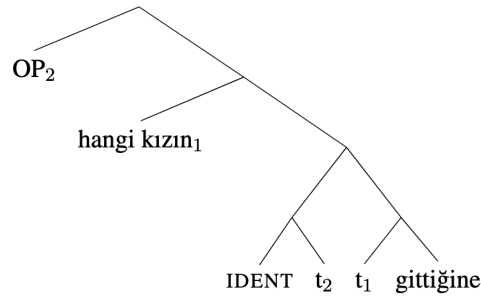
Here, the derivational steps in interpreting the inner structure of *hangi kızın gittiğine* are going to be identical to the ones we employ in wh-questions. So, just like in wh-questions, when an XP pied-pipes a YP that it is part of, YP is turned into a set by merging $[[IDENT] [OP]]$ on top of YP. Subsequently, the pied-piper XP moves to this newly created edge position and OP moves above XP to resolve the type mismatch. This is exactly the same derivation we find in wh-questions.

First, $[[IDENT] [OP]]$ is merged at the periphery of the embedded clause, as shown in (36a). Next, the wh-phrase moves to the created edge scope position, as shown in (36b). (The object-language λ -binders are not shown to simplify the LFs.)



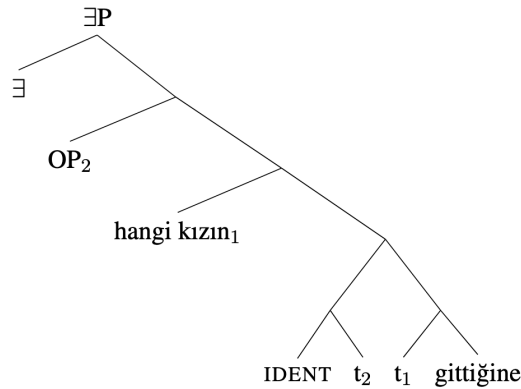
Then, just like in wh-questions, OP moves out to resolve the type mismatch, as shown in (37).

(37)

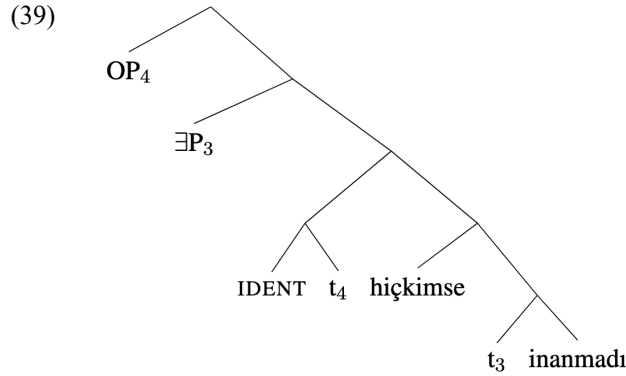


The only part where pied-piping structures differ from wh-questions is the fact that the resulting structure does not remain as a set (unlike wh-questions) but is turned into a quantifier/scope-taker. In particular, it is turned into an existential quantifier by merging the \exists morpheme on top. Hence, the structure in (37) is merged with \exists to form an existential quantifier on par with wh-phrases, as shown in (38).

(38)



This phrase is now a complex wh-phrase that will take scope by movement, just like wh-phrases in simple wh-questions. This is shown in (39) below, where $\exists P$ is shorthand for the structure in (38). Notice that the structure in (39) could have been the LF of *kime hiçkimse inanmadı?* ‘who did no one believe?’ where $\exists P$ would be the wh-phrase *kime*. But instead of a simple wh-phrase, we have the complex phrase *hangi kızın gittiğine* whose inner composition was given in (38).



Let us now turn to the compositional interpretation of this structure, starting with the structure in (37). Notice that the LF in (37) is identical to the LF of a wh-question. Accordingly, its denotation will be as in (40).

$$(40) \llbracket(37)\rrbracket^w = \lambda p_{\langle s,t \rangle} . \exists y: y \text{ is a girl in } w \ \& \ p = \lambda w'. y \text{ left in } w'$$

Next, since the LF in (37) is merged with the null type-neutral \exists morpheme giving us the structure in (38), the denotation will be of a quantifier type, as in (41).

$$(41) \llbracket(38)\rrbracket^w = \lambda R_{\langle \langle s,t \rangle, t \rangle} . \exists p \exists y: [y \text{ is a girl in } w] \ \& \ [p = \lambda w'. y \text{ left in } w'] \ \& \ [R(p)]$$

This complex expression, namely the entire pied-piping structure $\exists P$, is an existential quantifier over proposition sets. In some sense, it is a higher type wh-phrase of type $\langle \langle \langle s,t \rangle, t \rangle, t \rangle$. When it undergoes quantifier raising to a type t node, it leaves a trace of type $\langle s,t \rangle$ (i.e., the type of the trace t_3 in (39)) and hence creates a lambda abstract of type $\langle \langle s,t \rangle, t \rangle$. Putting these pieces together, we can calculate the denotation of the structure in (39) as in (42). This is the correct meaning for the wh-question asking which girl y is such that nobody believes p where p is the proposition that y left.

$$(42) \llbracket(39)\rrbracket^w = \lambda q_{\langle s,t \rangle} . \exists p \exists y: [y \text{ is a girl in } w] \ \& \ [p = \lambda w'. y \text{ left in } w'] \ \& \ [q = \lambda w''. \neg \exists x: x \text{ believes } p \text{ in } w'']$$

The importance of the type-neutrality of the morphemes used in composing pied-piping structures is revealed in cases where what is pied-piped is not a clause

(and semantically not a proposition). For example, (43b) exhibits pied-piping of the possessee by the possessor wh-phrase.

- (43) a. ??Hiçkimse hangi şarkıcı-nın yeni album-ün-ü
 nobody which singer-GEN new album-POS.3SG-ACC
 beğen-me-miş?
 like-NEG-EVID
 Int. ‘Which singer₁ is such that nobody liked their₁ new album?’
- b. [hangi şarkıcının yeni albümünü]₂ | hiçkimse t₂ beğenmemiş?
 ‘Which singer₁ is such that nobody liked their₁ new album?’

The current system also allows interpreting such structures. As long as the IDENT morpheme is assumed to be lexically specified to look for intensional arguments, just as it does in wh-questions, the correct meaning is derived as shown in (44) for (43b).⁸

- (44) $\| (43b) \|^{w=}$
 $\lambda q_{\langle s,t \rangle} . \exists f_{\langle s,e \rangle} \exists y: [y \text{ is a singer in } w] \ \&$
 $[f = \lambda w'. \text{ iz. } z=y\text{'s new album in } w'] \ \&$
 $[q = \lambda w''. \neg \exists x: x \text{ likes } f(w'') \text{ in } w'']$

5 Concluding Remarks

This paper has documented configurations in Turkish where pied-piping is enforced or is at least an unmarked option for obviation of intervention effects in wh-questions. Even though Turkish is not a language where canonical wh-movement is observed, it also does not exhibit a truly in-situ character. We have seen numerous instances where intervention obviation requires overt movement of the wh-phrase or a larger phrase that it is part of. This movement essentially targets the intended scope position, as expected under analyses where wh-phrases are quantifiers taking scope via movement. Accordingly, we have adopted an analysis, where the semantics of pied-piping is handled by the tools that are

⁸ Notice that the pied-pipee is an intensional object corresponding to the individual concept $[\lambda w'. \text{ iz. } z=y\text{'s new album in } w']$ where y is a variable ranging over singers in the evaluation world. In the LF, the string *hangi şarkıcının yeni albümünü* ‘which singer’s new album’ will correspond to an $\exists P$ of type $\langle \langle \langle s,e \rangle, t \rangle, t \rangle$, leaving a trace of type $\langle s,e \rangle$ when it undergoes movement. Given that this trace will be the sister of a transitive verb looking for an argument of type e , it will combine with its sister via Extensionalizing Function Application (von Stechow and Heim, 2011). For details see, Demirok (2019).

already required to build wh-questions while the syntax of pied-piping mirrors what is observed in wh-movement languages with clausal pied-piping.

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References

- Akar, D. (1990). *Wh-questions in Turkish* [Master's Thesis]. Boğaziçi University, İstanbul, Turkey.
- Arslan, C. (1999). *Approaches to wh-structures in Turkish* [Master's Thesis]. Boğaziçi University, İstanbul, Turkey.
- Atlamaz, Ü. (2023). *A bidimensional semantics for questions*. *Zemin*, 6, 82-127. <https://doi.org/10.5281/zenodo.10435936>
- Beck, S. (1996). Quantified structures as barriers for LF movement. *Natural Language Semantics*, 4, 1-56. <https://doi.org/10.1007/BF00263536>
- Beck, S. (2006). Intervention effects follow from focus interpretation. *Natural Language Semantics*, 14, 1-56. <https://doi.org/10.1007/s11050-005-4532-y>
- Beck, S., & Shin-Sook K. (1997). On wh- and operator scope in Korean. *Journal of East Asian Linguistics*, 6, 339-384. <https://doi.org/10.1023/A:1008280026102>
- Cable, S. (2010). *The grammar of Q: QpParticles, Wh-movement, and pied-piping*. Oxford University Press.
- Çakır, S. (2015). Island constraints in Turkish: A grammaticality judgment study. In D. Zeyrek et al. (Eds.), *Ankara papers in Turkish and Turkic linguistics* (pp. 68-76). Harrassowitz Verlag.

- Çakır, S. (2016). Island constraints and adjunct & argument asymmetry in Turkish. *Dilbilim Arařtırmaları Dergisi*, 27(2), 1-15. <https://doi.org/10.18492/dad.282138>
- Charlow, S. (2020). The scope of alternatives: indefiniteness and islands. *Linguistics and Philosophy* 43. 427–472.
- Cheng, L. L. (2003). *Wh-in-situ*. *Glott International*, 7(4), 103-109.
- Dayal, V. (2016). *Questions*. Oxford University Press.
- Demirok, Ö. (2019). *Scope theory revisited: Lessons from pied-piping in wh-questions*. [Doctoral Dissertation, MIT]. DSpace@MIT. <https://hdl.handle.net/1721.1/124104>
- Demirok, Ö. (2021). Intervention effects follow from scope rigidity in Turkish. *Proceedings of the 31st Semantics and Linguistic Theory Conference [SALT 31]*. 82–103.
- Duguine, M, & Irurtzun, A. (2014). From obligatory WH-movement to optional WH-in-situ in Labourdin Basque. *Language*, 90, 1-30. <https://doi.org/10.18148/hs/2014.v0i0.11>
- von Fintel, Kai, & Irene Heim. (2001). *Intensional semantics*. MIT Lecture notes for Advanced Semantics. MIT.
- Fox, D. (2012). *The semantics of questions*. Lecture notes, MIT.
- Görgülü, E. (2006). *Variable wh-words in Turkish* [Master's Thesis]. Boğaziçi University, İstanbul, Turkey.
- Göksel, A. (1998). Linearity, focus, postverbal position. In Lars Johanson (Ed.) *The Mainz meeting proceedings of the Seventh International Conference on Turkish Linguistics* Aug 3-6, 1994 (pp. 85-106). Harrassowitz Verlag.
- Hamblin, C L. (1973). Questions in Montague English. *Foundations of Language*, 1, 41-53.
- Heim, I. (2000). *Notes on Interrogative Semantics*. MIT Lecture notes for Advanced Semantics.
- Heim, I, & Kratzer, A. (1998). *Semantics in Generative Grammar*. Blackwell.
- Hoji, H. (1985). *Logical form constraints and configurational structures in Japanese* [Doctoral Dissertation]. University of Washington.
- Huhmarniemi, S. (2010). *The locality of snowballing wh-movement in Finnish*. Handout from GIST 1Workshop: Antilocality and Snowballing movement, Belgium, June 24-25.
- Huhmarniemi, S. (2012). *Finnish A'-movement: Edges and islands* [Doctoral Dissertation]. University of Helsinki.
- İşsever, S. (2009). A syntactic account of wh-in-situ in Turkish. In S. Ay, et al. (Eds.), *Essays on Turkish Linguistics: Proceedings of the 14th International Conference on Turkish Linguistics* (pp. 103-112). Harrassowitz Verlag.
- Karttunen, L. (1977). Syntax and semantics of questions. *Linguistics & Philosophy* 1: 3–44.
- Kelepir, M. (2001). *Topics in Turkish syntax: Clausal structure and scope* [Doctoral Dissertation, MIT]. DSpace@MIT. <http://hdl.handle.net/1721.1/8196>

- Kesen, Y. (2010). Intervention effects in simple Wh-questions in Turkish [Master's Thesis]. Boğaziçi University, İstanbul, Turkey.
- Kornfilt, J. (2008). Some observations on Turkish/Turkic RCs. *Paper given at Leipzig Spring School on Linguistic Diversity, MPI-EVA Conference, Leipzig.*
- Mayr, C. (2020). Intervention effects. In D. Gutzmann et al. (Eds.) *The Wiley Blackwell companion to semantics*. John Wiley & Sons.
- Özsoy, A. S. (1996). A'-dependencies in Turkish. *Current Issues in Turkish Linguistics* 5, 139–158.
- Özyıldız, D. (2017). Quantifiers in Turkish. In D. Paperno and E. L. Keenan (Eds.) *Handbook of quantifiers in natural language: Volume II. Studies in linguistics and philosophy* 97 (pp. 859-939). Springer.
- Pesetsky, D. (2000). *Phrasal movement and its kin*. MIT Press.
- Reinhart, T. (1997). Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and Philosophy*, 20, 335–397. <https://doi.org/10.1023/A:1005349801431>
- Reinhart, T. (1998). Wh-in-situ in the framework of the Minimalist Program. *Natural Language Semantics*, 6, 29–56. <https://doi.org/10.1023/A:1008240014550>
- Richards, N. (2000). An island effect in Japanese. *Journal of East Asian Linguistics*, 9, 187–205. <https://doi.org/10.1023/A:1008342011424>
- Shimoyama, J. (2006). Indeterminate phrase quantification in Japanese. *Natural Language Semantics*, 14, 139–173. <https://doi.org/10.1007/s11050-006-0001-5>
- von Stechow, A. (1996). Against LF pied-piping. *Natural Language Semantics*, 4, 57–119. <https://doi.org/10.1007/BF00263537>