Araştırma Makalesi / Research Article

A Bidimensional Semantics for Questions*

Soru Tümceleri İçin İki Boyutlu Bir Anlam Kuramı

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Abstract: This paper provides a formal semantic account of questions in Turkish within the Alternative Semantics framework. It provides a unified analysis for polar, conversation starter, alternative, narrow focus, and constituent questions. Assuming that a question denotes a set of alternative propositions, the paper develops an account where alternatives are generated in situ via focus and indeterminate pronouns and the derivation proceeds via pointwise function application. I argue that the so-called question particle MI in Turkish is a focus particle licensed under certain environments. The attachment site of MI correlates with the type of alternatives generated yielding various types of questions. I also provide an account of why response particles are compatible with polar, narrow focus, and conversation starter questions but not with constituent and alternative questions.
Keywords: Questions, focus, question particle, Alternative Semantics, Turkish.

Özet: Bu makale Türkçe soru tümcelerinin Seçenek Anlambilimi çerçevesinde formel bir anlambilimsel incelemesini sunmaktadır. Makale kutupsal, sohbet başlatıcı, seçenekli, dar odak ve öğe soruları için birleşik bir tahlil önermektedir. Bir sorunun bir dizi alternatif önermeyi ifade ettiği varsayılan bu makale, alternatif seçeneklerin odak ve belirsiz zamirler tarafından yerinde üretildiğini ve türetimin noktasal fonksiyon uygulamasıyla gerçekleştiğini ifade etmektedir. Soru parçacığı olarak nitelendirilen MI ekinin aslında belirli bağlamlarda ortaya çıkan bir odak parçacığı olduğu savunulmaktadır. MI'nın tümce içinde yer aldığı alan, üretilen seçeneklerin türünü belirleyerek çeşitli soru tipleri oluşturmaktadır. Makale, ayrıca cevap parçacıklarının neden kutupsal, dar odaklı ve sohbet başlatıcı sorularla kullanılabilirken seçenekli ve öğe sorularıyla kullanılamadığına açıklık getirmektedir.
Anahtar sözcükler: Sorular, odak, soru eki, Seçenek Anlambilimi, Türkçe.

This paper proposes a bidimensional semantics for questions. Bringing questions and focus closer under Alternative Semantics, I argue that a question has an ordinary semantic value and an alternative semantic value. Semantically, questions have been standardly treated as sets of alternative propositions since Hamblin.[1] Semantic content of a question is interpreted as a discourse question (i.e. information seeking) when it is embedded under a question force, say Q. Rooth,[2] following an intuition first mentioned in Jackendoff,[3] argues that the function of focus is to evoke alternatives. Bringing together Hamblin and Rooth, I argue that discourse questions (i.e. information seeking questions) can be established by embedding under Q a set of alternative propositions generated by focus. Evidence comes from Turkish where a dedicated focus particle generates a variety of question types depending on the position to which it is attached.

The organization of the paper is as follows: Section 2 introduces the core data from Turkish. Section 3 proposes the analysis and shows how all question types listed in section 2 can be generated. Section 4 presents a theory of response particles and how they interact with follow-up phrases. Section 5 provides some extensions. Section 6 concludes the discussion.

1. Facts

The empirical coverage of this paper includes constituent, polar, conversation starter, alternative and narrow focus questions in Turkish. In the following, I list the properties of these questions.

1.1. Constituent Questions

Constituent questions in Turkish are formed in situ with indeterminate phrases.

(1)	Kim	gel-di?
	kim	come-PAST
	Who came?	

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1 Charles L. Hamblin, "Questions in Montague English," *Foundations of Language* 10, no. 1 (1973): 41-53.

2 Mats Rooth, "Association with Focus" (PhD diss., UMass-Amherst, 1985).

3 Ray Jackendoff, *Semantic Interpretation in Generative Grammar*, Studies in Linguistics series 2 (Cambridge, Mass: MIT Press, 1972).

Wh-elements in Turkish are indeterminate phrases.[4] The indeterminate phrase *kim* can have interrogative (1), NPI (2), existential (3), and free choice "any" (4) meaning depending on the morphemes that attach to it.

(2) Kim-se gel-me-di.
kim-COND come-NEG-PAST
Nobody came.

(3) Kim-isi gel-di.
kim-POSS come-PAST
Some came.

(4) Kim gel-di-yse
kim come-PAST-COND
Whoever came

Additionally, wh-questions in Turkish are insensitive to complex noun phrase and adjunct islands.[5]

(5) Sen kim-in al-dığ-ı pasta-yı ye-di-n?
You who-GEN buy-NMLZ-POSS cake-ACC eat-PAST-2SG
Who_x did you eat the cake that x bought?

(6) Sen kim gel-di diye git-ti-n?
you who come-PAST because go-PAST-2SG
Who_x did you leave because x came?

1.2. Polar Questions & Conversation Starters

Polar questions in Turkish are established by placing the "MI" particle at the end of the clause. This particle is regarded as the "Q-particle" by many in the Turkish literature.[6] In this paper, I treat it as a dedicated focus particle. Throughout the paper, it is called MI. (7) is an instance of polar questions in Turkish.

4 Hubert Truckenbrodt, "An Analysis of Prosodic F-Effects in Interrogatives: Prosody, Syntax and Semantics," *Lingua* 124 (January 2013): 131-175.

5 They are wh-island sensitive, though (just like in Japanese).

6 Gülşat Aygen, "Q-Particle," *Dil ve Edebiyat Dergisi* 4, no. 1 (2007); Aslı Göksel and Celia Kerslake, *Turkish: A Comprehensive Grammar*, Routledge comprehensive grammars (London: Routledge, 2005); Beste Kamali and Daniel Büring, "Topics in Questions" (Presented at the GLOW 34, Vienna, 2011).

(7) Ali gel-di mi?
ali come-PAST MI
Did Ali come?

The polar question in (7) can be responded by either (8a) or (8b). Polar questions are taken to denote sets with two alternatives that are complements of each other. For example, in Hamblin/Karttunen tradition, polar questions denote alternatives in the form of {φ , ¬φ}. Following Hamblin, then, (7) roughly denotes the alternative set in (9).

(8) a. Evet. Gel-di.
Yes come-PAST.
Yes he came.

b. Hayır. Gel-me-di.
No come-NEG-PAST
No, he didn't come.

(9) {came *(ali)*, ¬came *(ali)*}

The set of alternatives in (9) and the others in this section are schematic. They will be modified in section 3.

In addition to the binary meanings of polar questions discussed above, Bolinger[7] and Biezma & Rawlins[8] point to another use of polar questions as conversation starters. In such cases, the alternatives raised by a polar question like (7) are not restricted to {φ, ¬φ}. Consider the following example.

(10) a. Do you play golf?
b. No, I play tennis.

In a context where one of the speakers wants to start a conversation with a question like (10a), (10b) is a felicitous answer. If the denotation of a question is

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7 Dwight Bolinger, "Yes—No Questions Are Not Alternative Questions," in *Questions*, ed. Henry Hiż (Dordrecht: Springer Netherlands, 1978), 87-105, https://doi.org/10.1007/978-94-009-9509-3_3.

8 María Biezma and Kyle Rawlins, "Responding to Alternative and Polar Questions," *Linguistics and Philosophy* 35, no. 5 (October 2012): 361-406.

the set of possible answers, then (10b) must be in the alternative set generated by (10a). An even more striking case is an answer like (11) in the following context.

Imagine that Jane meets Jose at a sports complex. Jane asks the question in (10a). Jose responds by (11), which is quite felicitous in this context.

(11) No, my wife plays tennis.[9]

The facts in Turkish are just like in English.

(12)	a.	Golf	oyna-r	mı-sın?	
		Golf	play-AOR	MI-2SG	
		Do you play golf?			
	b.	Hayır.	Tenis	oyna-r-ım.	
		No	tennis	play-AOR-1SG	
		No, I play tennis.			
(13)	a.	Golf	oynu-yor	mu-sun?	
		Golf	play-IMPF	MI-2SG	
		Are you playing golf?			
	b.	Hayır.	Eş-im	tenis	oynu-yor
		No	spouse-1SG	tennis	play-IMPF
		No, My spouse is playing tennis.			

The theory of polar questions should, then, account for the conversation starter type questions listed above. Any theory of polar questions should explain where answers like (10b) and (11) are coming from.

1.3. Narrow Focus Questions

Turkish has a third type of question where a constituent is narrowly focused by placing the MI particle after the focused constituent. (14)-(16) are examples of a narrow focus question where the focused phrase is indicated by capitalization.

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9 I would like to thank Jane Grimshaw for pointing out this type of answer to me.

(14) ALİ mi gel-di?
ali MI come-PAST
Was it Ali who came?

(15) Ali EVE mi git-ti?
ali home MI go-PAST
Was it home that Ali went?

(16) Ali DÜN mü git-ti?
ali yesterday MI go-PAST
Was it yesterday when Ali went?[10]

Narrow focus questions share properties of constituent questions and polar questions. First of all, narrow focus questions are similar to polar questions as they are formed by the MI particle and can be responded via polarity response particles *yes/no*.

(17) a. ALİ mi gel-di.
ali MI come-PAST
Was it Ali who came.
b. Evet.
Yes.

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10 The closest translation of narrow focus questions into English is similar to clefts. Therefore, I translate them as clefts throughout. Nevertheless, they differ from clefts in two points. First of all, clefts in Turkish contain relative clauses.

(i) Gel-en Ali mi?
come-nmlz Ali mı
Is the one who came Ali?

Second, clefts cannot contain quantifiers like *someone* or *anyone*.

(ii) * Was it someone who came?

This is true for Turkish clefts as well.

(iii) * Gel-en biri mi?
come-nmlz someone mı
Was the one who came someone?

Narrow focus questions, on the other hand, do not (necessarily) contain any relative clauses. Additionally, they can host quantifiers like *someone* or *anyone*.

Second, in terms of the alternatives generated, narrow focus questions resemble constituent questions. In constituent questions, the wh-element produces alternatives made available by the context. So, in a context where the individuals are {j, b, m} a constituent question like in (1) denotes {came(*j*), came(*b*), came(*m*)}. Similarly, in narrow focus questions, alternatives are established by substituting the focused constituent with all the elements in the relevant domain constrained by context. Hence, in a context where the only individuals are {*ali*, *mehmet*} (17a) schematically denotes (18).

(18) {came(*a*), came(*m*)}

This is different from an ordinary polar question, which typically consists of the alternative raised by the question nucleus and its complement (i.e. negation).

Third, narrow focus questions behave like constituent questions in terms of question-answer congruence discussed by Rooth.[11] (20a) is a felicitous response to (19) but (20b) is not.

(19) Who saw John?

(20) a. $[\text{BILL}]_F$ saw John
b. #Bill saw $[\text{JOHN}]_F$

Narrow focus questions abide by the same question answer congruence patterns as constituent questions.

(21) ALİ mi Mehmet-i gördü?
ali MI mehmet-ACC see-PAST
Was it Ali who saw Mehmet?

(22) a. Evet. ALI Mehmet-i gördü
Yes. Ali mehmet-ACC see-PAST
Yes, Ali saw Mehmet.
b. #Evet. Ali MEHMET-i gördü
Yes. ali mehmet-ACC see-PAST
Yes. Ali saw MEHMET.

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11 Mats Rooth, "A Theory of Focus Interpretation," *Natural Language Semantics* 1, no. 1 (1992): 75-116.

Fourth, narrow focus questions are akin to constituent questions in that they introduce a certain presupposition about the part of the question that follow the MI particle. Constituent questions like "*Who came?"* presuppose that someone came.[12] In cases where the question is responded with something like "*Nobody came*," the answer denies the presupposition of the constituent question. Narrow focus questions behave the same way. (21), for example, carries the presupposition that someone saw Mehmet. An answer like *kimse* "nobody" denies the presupposition.

Finally, narrow focus questions differ from ordinary polar questions in terms of the presupposition they carry. This is clearly observed in cases when negative answer is used towards a negated polar question and a negated narrow focus question.

(23) a. Ali gel-me-di mi? *Polar question*
ali come-NEG-PAST MI
Did Ali not come?
b. Hayır. → Ali did not come.
No.

(24) a. Ali mi gel-me-di? *Narrow focus question*
ali MI come-NEG-PAST
Did Ali not come?
b. Hayır. → Ali came. (Someone else didn't.)
No.

To summarize, narrow focus questions resemble ordinary polar questions in that they include the MI particle and can be responded to via *yes/no* particles. On the other hand, they behave like constituent questions in terms of the presupposition they present, the alternatives they raise, as well as question-answer congruence.

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12 Veneeta Dayal, *Questions*, Oxford Surveys in Semantics and Pragmatics 4 (Oxford: Oxford University Press, 2016).

1.4. Alternative Questions

Alternative questions (AltQs) in Turkish consist of two parallel clauses where a phrase is narrowly focused in each clause. Gracanin-Yüksek[13] argues that they consist of CP disjuncts with ellipsis in the second clause. The MI particle is placed immediately after each alternative.

(25)	Ali	ÇAY	mı	iç-ti	KAHVE	mi?
	ali	tea	MI	drink-PAST	coffee	MI
	Did Ali drink TEA or COFFEE?					

Schematically, the set of alternatives raised by an AltQ like in (25) is as in (26). Polarity response particles yes/no cannot be felicitously used as a response to an AltQ.

(26) {*λw'*. drink (*ali*, *tea*)(w'), *λw'*. drink (*ali*, *coffee*)(*w'*)}

In this section, I listed the properties of question types that need to be accounted for. The five types of questions are constituent, narrow focus, polar, conversation starter, and alternative questions.

2. Proposal

In this section, I list the core assumptions the paper rests on. Then, I propose a bidimensional semantics for questions. The core assumptions are as follows: The first set of assumptions is about the denotation of questions. Semantically, questions denote sets of alternative propositions.[14] In analyzing questions, I adopt the Alternative Semantics framework following Hamblin,[15] Rooth,[16] Kratzer & Shimoyama,[17] and Shimoyama.[18] The semantic value of an expression

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13 Martina Gračanin-Yüksek, "Alternative Questions in Turkish," *Dilbilim Araştırmaları Dergisi*, no. 1 (June 30, 2016), http://dergipark.gov.tr/doi/10.18492/dad.98860. (accessed September 8, 2023)

14 Charles L. Hamblin, "Questions in Montague English."

15 Hamblin, "Questions in Montague English."

16 Rooth, "Association with Focus."

17 Angelika Kratzer and Junko Shimoyama, "Indeterminate Pronouns: The View from Japanese," in *Contrastiveness in Information Structure, Alternatives and Scalar Implicatures*, ed. Chungmin Lee, Ferenc Kiefer, and Manfred Krifka, vol. 91, Studies in Natural Language and Linguistic Theory (Cham: Springer International Publishing, 2017), 123-143.

18 Junko Shimoyama, "Indeterminate Phrase Quantification in Japanese," *Natural Language Semantics* 14, no. 2 (June 2006): 139-173.

is a set of objects rather than a single object. Some expressions denote singleton sets while some others denote sets with multiple members of the same type. Semantic composition follows via *pointwise function application*. A fairly standard rule for *pointwise function application* from Shimoyama who adopts it from Rooth is given in (27).

(27) If α is a branching node with daughters β and ɣ, and $[\![\beta]\!]^{w,g} \subseteq D_{\langle\sigma\tau\rangle}$ and $[\![\gamma]\!]^{w,g} \subseteq D_{\langle\sigma\rangle}$ then $[\![\alpha]\!]^{w,g}$ = $\{f(x) \in D_{\langle\tau\rangle} : f \in [\![\beta]\!]^{w,g} \,\&\, x \in [\![\gamma]\!]^{w,g}\}$.

Questions are established in the following way. First, alternatives are generated in situ (by expressions denoting multi-membered sets). By pointwise function application, sets of alternative propositions are generated. Embedding a set of alternative propositions under a Q quantifier turns the set of propositions into a question. In Kratzer & Shimoyama's framework, this Q quantifier is semantically vacuous. Adapting Kratzer & Shimoyama, I take Q to be the interrogative force in the C head. Semantically, it is a set with the identity function.

(28) $[\![Q]\!] = \{\lambda p.p\}$

Briefly, when a set of alternative propositions is embedded under Q in (28), we get a discourse question.

The second set of assumptions is about the semantics of focus. Following Rooth,[19] I assume that focus takes a phrase and returns a set of contextually salient alternatives. For Rooth, focus adds a secondary dimension to meaning. Each expression has an ordinary semantic value $[\![\ .]\!]^0$ and a focus semantic value $[\![\ .]\!]^f$. Ordinary semantic value and focus semantic value of a non-focused expression is vacuously the same. On the other hand, ordinary semantic value of a focused expression is itself while focus semantic value of a focused phrase is a set of contextually salient alternatives of the expression including itself.

I assume a slightly different interpretation of Rooth's double layered semantics. Following the interpretation in Krifka,[20] I assume that each expression has an ordinary semantic value $[\![\ .]\!]^0$ and an alternative semantic value $[\![\ .]\!]^a$. At

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19 Rooth, "Association with Focus."

20 Manfred Krifka, "Association with Focus Phrases," in *The Architecture of Focus*, ed. Valerie Molnar and Susanne Winkler (Berlin: De Gruyter Mouton, 2006), 105-136.

this point this looks like a difference only in notation. The crucial difference, however, is the assumption that the ordinary semantic value and the alternative semantic value of some non-focused phrases can be different. Focus semantic value is a proper subset of alternative semantic value.

Having listed the core assumptions, I turn to my proposal and analyze the data discussed in section 2. Just like declarative sentences, questions have a double layered semantics. Each question has an ordinary semantic value and an alternative semantic value. In cases of constituent questions and AltQs, ordinary and alternative semantic values of questions are trivially the same.[21] On the other hand, in polar, narrow focus, and conversation starter questions, ordinary semantic values are singleton sets while alternative semantic values are multi-membered sets where alternatives are generated by focus. This difference between the two types of questions is the reason why constituent questions and AltQs cannot be responded via *yes/no* unlike other types of questions.

In the following, I analyze all the question types discussed in section 2 based on the proposal above and show how they are compositionally derived.

2.1. Constituent Questions

Constituent questions in Turkish are very much like Japanese constituent questions. As discussed in section 2, wh-elements in Turkish are indeterminate phrases. Constituent questions do not involve movement. Additionally, wh-

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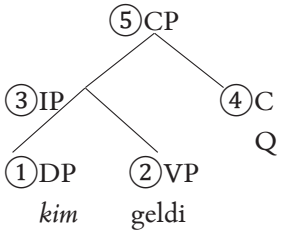
21 This is different from Beck (*Intervention Effects*), who argues that wh-expressions do not have ordinary semantic values. In her theory, it is crucial that wh-expressions don't have ordinary semantic values. The alternative semantic value contributed by the wh-expression has to be turned into an ordinary semantic value by the Q operator. This is one of the reasons why intervention effects occur when a focus operator intervenes the alternatives and the Q operator. The alternative set contributed by the wh-expression is turned into a semantic object by the focus operator that is no longer interpretable for the Q operator. I follow the Hamblin ("Questions in Montague English") tradition where wh-expressions have ordinary semantic values. Intervention issues can still be accounted in this view. An interesting proposal has been put forth by Li & Law ("Alternatives in different dimensions"). They argue that focus intervention effects are not due to relativized minimality. Instead, they are due to the type of semantic objects generated by "focus + wh-expressions." When there is both focus and a wh-expression in the scope of a focus operator, the type of semantic object is a set of sets of alternatives which cannot be interpreted by the focus operator. Focus intervention is beyond the scope of this paper. Therefore, I will not take a stand on any of the approaches but will refer the reader to Li & Law. See also Demirok (*Intervention Effects*) for a discussion on Turkish.

questions in Turkish are complex noun phrase and adjunct island insensitive while they are wh-island sensitive. The alternative semantics framework adopted in this paper accounts for all these facts quite straightforwardly. In other words, constituent questions in Turkish can be analyzed exactly like Japanese constituent questions in the line of Kratzer & Shimoyama.[22] The only difference proposed here is that constituent questions have a double layered semantics. Here is a sample derivation for constituent questions in Turkish.

(29) Kim gel-di?
Who come-PAST

(30)



In the tree above, *kim* is an indeterminate pronoun with a [+human] restriction. It denotes the set of individuals in the context. The VP is a singleton. The DP combines with the VP via pointwise function application.

Ordinary Semantic Value of (29).

① $[\![kim]\!]^0$ = $\{x \in D_e$: human (x)(w)$\}$
② $[\![geldi]\!]^0$ = $\{\lambda x \lambda w'$. came(x)(w')$\}$
③ $[\![kim\ geldi]\!]^0$ = $\{f(x)$: $f \in [\![VP]\!]^0 \& x \in [\![DP]\!]^0\}$
= $\{\lambda w'$.came(x)(w'): human (x)(w)$\}$

In constituent questions, the set of alternative propositions is already established at IP. Q, which is at C, is semantically vacuous. It just passes up the set of alternatives.

④ $[\![Q]\!]^0 = \{\lambda p.p\}$

Q combines with the set of alternative propositions via pointwise function application. The outcome is a Hamblin set.

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22 Kratzer and Shimoyama, "Indeterminate Pronouns."

⑤ $[\![\text{kim geldi Q}]\!]^0$ = {λw'. came(x)(w'): human (x)(w)}

Alternative Semantic Value of (29)

In the case of constituent questions, the alternative semantic value is vacuously the same as the ordinary semantic value.

① $[\![kim]\!]^a$ = {x ∈ D_e: human (x)(w)}
② $[\![geldi]\!]^a$ = {λxλw'. came(x)(w')}
③ $[\![kim\ geldi]\!]^a$ = {f(x): f ∈ $[\![VP]\!]^a$ & x ∈ $[\![DP]\!]^a$}
= {λw'.came(x)(w'): human (x)(w)}
④ $[\![Q]\!]^a$ = {λp.p}
⑤ $[\![\text{kim geldi Q}]\!]^a$ = {λw'. came(x)(w'): human (x)(w)}

Briefly, a constituent question has an ordinary semantic value and an alternative semantic value which are just the same.

(31) Denotation of (29):
- Ordinary Semantic Value = {λw'.came(x)(w'): human (x)(w)}
- Alternative Semantic Value = {λw'.came(x)(w'): human (x)(w)}

A crucial point regarding the denotations of constituent questions is that they never have singleton sets as their semantic values because wh-elements are inherent alternative generators and always denote a non-singleton set. Dayal[23] points out that questions are felicitous only when the domain of quantification is plural. In other words, although it is possible to restrict the domain of quantification to a singleton and establish a constituent question with a singleton proposition, such questions are pragmatically odd.

2.2. MI questions

All the question types in this paper excluding constituent questions include the MI particle. Therefore, it is a crucial step to layout the assumptions about MI before analyzing a diverse array of question types established with this particle.

Anyone with some familiarity with question particles might think that it is like Japanese question particle *ka*. However, it is clearly different from *ka*. MI does not occur with wh-elements. Additionally, it marks the phrase it attaches to with focus. MI is regarded as the question particle in Turkish by

23 Dayal, *Questions*.

many.[24] However, use of MI is not restricted to questions. It can also be used in conditionals as in (32a), or as an intensifier as in (32b.)

(32) a. Ali gel-di mi gid-er-iz.
Ali come-PAST MI go-AOR-1PL
We'll leave when Ali comes.

b. güzel mi güzel araba[25]
nice MI nice car
very nice car

I treat MI as a semantically vacuous particle that marks the element it adjoins to with a F(ocus) feature.[26] Distribution of MI is not free, though. It can only be licensed under a Q(uestion Force), a conditional, or an intensifying context. I assume that MI is licensed when it is c-commanded by Q (ignoring the conditional and intensifying contexts for the purposes of this paper).

2.2.1. Narrow Focus Questions

Narrow focus questions share the properties of constituent questions as well as polar questions. They are similar to constituent questions in terms of the alternatives they generate. On the other hand, they are like polar questions in that they can be responded with *yes/no*. I show how the relevant alternatives are generated in this section and defer the interaction with *yes/no* to section (4).

Consider the narrow focus question in (33).

(33) $[\text{ALİ}]_F$ mi gel-di?
Ali MI come-PAST
Was it Ali who came?

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24 Aygen, "Q-Particle"; Göksel and Kerslake, *Turkish: A Comprehensive Grammar*; Kamali and Büring, "Topics in Questions".

25 I thank Hasan Mert Yıldırım for drawing my attention to such uses of the MI particle.

26 See Gonzalez ("Interrogative Particles") who also treats MI as a semantically vacuous focus sensitive particle. Gonzalez builds on an earlier version of this paper as well as Kamali & Krifka ("Focus and contrastive topic in questions") to account for the behavior of Q particles in Finnish and Turkish in a bidimensional semantics framework. See also Kamali & Krifka (Ibid.) for a detailed analysis of focus in Turkish polar questions in a different framework.

The narrow focus question in (33) can be used in a context like in (34).

(34) Eren thinks that someone came but he is not sure about who came. On the other hand, he suspects (or guesses) that the person who came was Ali. So, he asks (33).

Narrow focus questions resemble constituent questions in terms of alternatives they generate precisely because (35) is a good answer to (33).

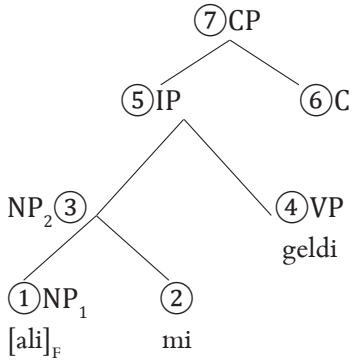
(35)	Hayır.	Mehmet	gel-di.
	No	Mehmet	come-PAST

Note that *Mehmet* is not in the question nucleus. However, somehow it is evoked as an alternative. This is true of constituent questions, too. In the framework adopted here, a question like *who came* denotes a set like {*John came, Bill came*}. Just as in narrow focus questions, *John* or *Bill* is not explicitly stated in the question nucleus. However, somehow, they make it into the denotation of the question.

In the following, I show how the alternatives denoted by the question in (36) are generated and what exactly a narrow focus question means.

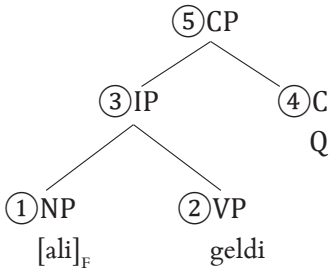
The syntactic structure of (33) is roughly as in (36).

(36)



The only duty of MI is to focus mark the phrase it adjoins to (say by checking an F feature). It is semantically vacuous. To be more explicit, it is invisible at LF. Therefore, the denotation of NP_1 and NP_2 in the tree above are just the same at LF. Indeed, the LF structure of (33) is (37).

(36)



The question in (33) has a two-dimensional layered semantics. It has an ordinary semantic value and an alternative semantic value which are compositionally derived in the following way.

The ordinary semantic value of (33) is calculated as in (38).

(38)

① NP = $[\![[ali]_F]\!]^0$ = {*ali*}
② $[\![geldi]\!]^0$ = {$\lambda x \lambda w'$. came*(x)(w')*}
③ $[\![ali\ mi\ geldi]\!]^0$ = {f(x): f ∈ $[\![geldi]\!]^0$ & x ∈ $[\![[ali]_F]\!]^0$}
= {$\lambda w'$.came*(ali)(w')*}
④ $[\![Q]\!]^0$ = {$\lambda p.p$}
⑤ [ali mi geldi Q]^0 = {$\lambda w'$. came*(ali)(w')*}

The ordinary semantic value yields a singleton with the proposition denoted by the question nucleus. The alternatives are generated as the alternative semantic value. Focus on NP yields a contextually salient set of alternative individuals which compose with the VP via pointwise function application to yield the set of alternative propositions. The alternative semantic value of (33) is calculated as in (39).

(39)

① NP_1 = $[\![[ali]_F]\!]^a$ = {*ali, bill*}
② $[\![geldi]\!]^a$ = {$\lambda x \lambda w'$. came*(x)(w')*}
③ $[\![ali\ mi\ geldi]\!]^a$ = {f(x): f ∈ $[\![geldi]\!]^a$ & x ∈ $[\![[ali]_F]\!]^a$}
= {$\lambda w'$.came(*ali*)(w'), $\lambda w'$.came*(bill)(w')*}
④ $[\![Q]\!]^a$ = {$\lambda p.p$}
⑤ [ali mi geldi Q]^a = {$\lambda w'$.came(*ali*)*(w')*, $\lambda w'$.came*(bill)(w')*}

The meaning of a narrow focus question is then a two dimensional meaning with an ordinary semantic value and an alternative semantic value. (33) denotes (40).

(40)

- Ordinary Semantic Value = $\{\lambda w'.\text{came}(ali)(w')\}$
- Alternative Semantic Value = $\{\lambda w'.\text{came}(ali)(w'), \lambda w'.\text{came}(bill)(w')\}$

The meaning proposed in (40) fits well with the core properties of narrow focus questions. First of all, the desired alternatives are generated. Second, the proposition denoted by the nucleus is given a special status as the ordinary semantic value of the question. In (34), I stated that the speaker suspects/guesses that the one who came was Ali. In a way, the proposition $\lambda w'.\text{came}(ali)(w')$ is given a special status, which is captured by the double layered meaning given in (40).

2.2.2. Polar Questions & Conversation Starters

In this section, I analyze polar questions in tandem with conversation starter questions like "*Do you play golf?*" As described in section 2, a polar question schematically has the form of {p, ¬p}. On the other hand, conversation starters have a wider set of alternatives. A conversation starter like "*Do you play golf?*" can be felicitously responded to with an answer like "*No, I play tennis*."

Ordinary polar questions and conversation starters are linearly isomorphic both in English and Turkish. Therefore, any theory of ordinary polar questions must make room for conversation starter type questions. In the following, I propose two analyses neither of which claims a clear win over the other. The two approaches can be termed as linearly isomorphic and syntactically isomorphic.

2.2.2.1. Linearly Isomorphic

Linearly isomorphic theory is based on the idea that the two types of questions are syntactically different. The MI particle attaches to the polarity of the clause in polar questions.[27] On the other hand, MI is attached to VP in conversation starter questions. This approach clearly distinguishes the two types of questions both syntactically and semantically.

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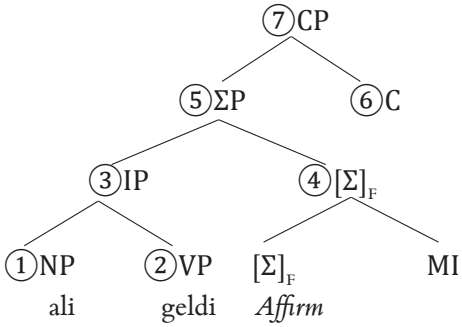
27 Beste Kamali, "The Question Particle in Turkish: Consequences for the Interfaces," in *Online Complement to Proceedings of WCCFL, 28*, 2011.

Aligning with Kamali,[28] I propose that polar questions can be established by focusing the polarity of the clause. Laka[29] argues that IP is dominated by a ΣP whose head can be *affirmative* or *negative*. The affirmative and negative information is encoded on this head. Focusing Σ yields the alternative set consisting of *affirmative* and *negative* clauses, which is the desired semantics for polar questions. A polar question like (41) is generated in the following way.

(41) Ali gel-di $[\Sigma]_F$ mi?
ali come-PAST MI
Did Ali come?

(42)



The ordinary semantic value of (1) is calculated in the following way.

(43)

① $[\![ali]\!]^0$	= {*ali*}
② $[\![geldi]\!]^0$	= {$\lambda x \lambda w'$. came$(x)(w')$}
③ $[\![ali\ geldi]\!]^0$	= {$\lambda w'$.came$(ali)(w')$}
④ $\Sigma = [\![[affirm]_F]\!]^0$	= {$\lambda p.p$}
⑤ $[\![\Sigma]\!]^0$ ($[\![IP]\!]^0$)	= {$\lambda w'$.came$(ali)(w')$}
⑥ $[\![Q]\!]^0$	= {$\lambda p.p$}
⑤ $[\![C]\!]^0$ ($[\![\Sigma P]\!]^0$)	= {$\lambda w'$.came$(ali)(w')$}

On the other hand, the alternative semantic value of (41) is calculated as in (44).

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28 Kamali, "The Question Particle in Turkish."

29 Itziar Laka, "Negation in Syntax: On the Nature of Functional Categories and Projections" (PhD diss., MIT, 1990).

(44)

① $[\![ali]\!]^a$ = {*ali*}
② $[\![geldi]\!]^a$ = {$\lambda x \lambda w'$. came*(x)(w')*}
③ $[\![ali\ geldi]\!]^a$ = {$\lambda w'$.came(*ali*)*(w')*}
④ $\Sigma = [\![[affirm]_F]\!]^a$ = {$\lambda p.p, \lambda p \lambda w'.\neg p\ (w)$}
⑤ $[\![\Sigma]\!]^a([\![IP]\!]^a)$ = {$\lambda w'$.came(*ali*)*(w')*, $\lambda w'.\neg$came(*ali*)*(w')*}
⑥ $[\![Q]\!]^a$ = {$\lambda p.p$}
⑤ $[\![C]\!]^a([\![\Sigma P]\!]^a)$ = {$\lambda w'$.came(*ali*)*(w')*, $\lambda w'.\neg$came(*ali*)*(w')*}

The polar question in (41), then, means (45).

(45)

- Ordinary Semantic Value = {$\lambda w'$.came(*ali*)(*w'*)}
- Alternative Semantic Value = {$\lambda w'$.came(*ali*)(*w'*), λw'.$\neg$came(*ali*)(*w'*)}

Returning to conversation starters, we face two types of answers that need to be captured. Consider a question like "*Do you play golf?*" The two types of answers that I am interested in are given in (46).

(46) a. No, I play tennis.
b. No, my husband plays tennis.

The facts about such questions are similar in Turkish as shown in (12) and (13). So, an answer to a polar question like "*Do you play golf?*" in Turkish would be as in (47).

(47) a. Hayır. Tenis oyna-r-ım.
No tennis play-AOR-1SG
No, I play tennis.

b. Hayır. Eş-im tenis oynu-yor.
No spouse-1SG tennis play-IMPF
No, my spouse is playing tennis.

The two types of answers differ from each other in terms of the phrases they are alternatives of. The (a) answers in (46) and (47) are alternatives of *playing golf* hence the VP. On the other hand, the (b) answers are alternatives of the whole IP.

Following a distinction made in Dayal (forthcoming), I argue that, in Turkish, (a) answers are direct answers while (b) answers are indirect answers.

In other words, (a) answers are in the denotation of a conversation starter question while (b) answers are not. Before, showing how conversation starters are derived compositionally, let me clarify how (b) answers can be used as answers to conversation starters.

Dayal[30] defines indirect answers as those answers from which an answer to the question can be deduced via Gricean reasoning. Such answers are not in the alternative set generated by the question. Consider the <question, answer> pair <*Do you play golf? No my husband plays tennis.*>. This <Q, A> pair is felicitous in the following context.

- Alex comes across Sam in a sports complex. Alex wants to start the conversation and asks, "Do you play golf?" Sam says, "No, my husband plays tennis."[31]

The question here is interpreted as sub-question of "Why are you here?" The alternatives raised by "Why are you here?" are {You are here because p, You are here because q, ...}. p and q are the possible reasons why Sam is at the gym. So, by presenting one of the alternatives as a question, Alex invokes the larger question under discussion. Sam, on the other hand, responds by saying "No, my husband plays golf." By this answer Sam means she is there because her husband plays golf.

In a more explicit discourse, the short conversation above would be as follows.

Alex: Why are you here? Are you here because you play tennis?
Sam: No, I am here because my husband plays golf.

Here is how the Gricean reasoning could be depicted:

Alex to himself: Sam is in the sports complex. She must be here for a reason. Is she here because she plays tennis? If she plays tennis, that must be the reason she is here.

Alex to Sam: Do you play tennis?

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30 Dayal, *Questions*.

31 This context was suggested to me by Jane Grimshaw (p.c.).

Sam to herself: Alex asked this question because he must be wondering why I am here. I am not here because I play tennis. I am here because my husband plays golf.

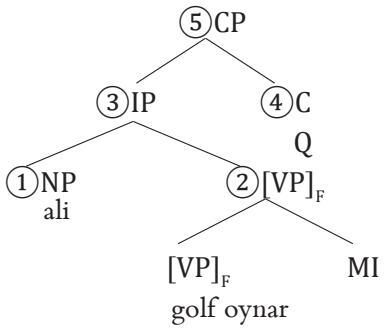
Sam to Alex: No, my husband plays golf.

Alex to himself: Sam said "No." So, she cannot be here because she plays tennis. Then, she must be here for some other reason. She said, "My husband plays golf." So, she must be here because her husband plays golf.

Now that I have shown how indirect answers like (46b/47b) can be captured via Gricean reasoning, I can return to the denotation of conversation starter questions. The proposal is that conversation starter questions are syntactically distinct from polar questions. They are formed by placing MI next to VP to generate alternatives of the predicate. A conversation starter question like (48) is derived in the following way.

(48) a. Ali [golf oynar]$_F$ mi?
ali golf play MI
Does Ali play golf?

(42)



Ordinary semantic value of (48):

① $[\![ali]\!]^0$ = {*ali*}
② $[\![[golf\ oynar]_F]\!]^0$ = {$\lambda x \lambda w'$.play golf*(x)(w')*}
③ $[\![IP]\!]^0$ = {$\lambda w'$.play golf(*ali*)*(w')*}
④ $[\![Q]\!]^0$ = {$\lambda p.p$}
⑤ $[\![CP]\!]^0$ = {$\lambda w'$.play golf(*ali*)*(w')*}

Alternative semantic value of (48):

① $[\![ali]\!]^a$ = {*ali*}
② $[\![[golf\ oynar]_F]\!]^a$ = {$\lambda x \lambda w'$.play golf*(x)(w')*, $\lambda x \lambda w'$.play tennis*(x)(w')*, $\lambda x \lambda w'$.jog*(x)(w')*}
③ $[\![IP]\!]^a$ = {$\lambda w'$.play golf(*ali*)*(w')*, $\lambda x \lambda w'$.play tennis*(ali)(w')*, $\lambda x \lambda w'$.jog*(ali)(w')*}
④ $[\![Q]\!]^a$ = {$\lambda p.p$}
⑤ $[\![CP]\!]^a$ = {$\lambda w'$.play golf(*ali*)*(w')*, $\lambda x \lambda w'$.play tennis*(ali)(w')*, $\lambda x \lambda w'$.jog*(ali)(w')*}

The conversation starter question in (48), then, means (50).

(50)

- Ordinary Semantic Value = {$\lambda w'$.play golf(*ali*)(*w'*)}
- Alternative Semantic Value = {$\lambda w'$.play golf(*ali*)(*w'*), $\lambda w'$.play tennis(*ali*)(*w'*), $\lambda w'$.jog(*ali*)(*w'*)}

To summarize this section, I have argued that polar questions are established by focusing the polarity of the clause. Conversation starter questions are linearly isomorphic to polar question but they differ in terms of their syntax and semantics. They are formed by focusing the VP. Finally, I argued that answers that are alternatives of the IP (my husband plays golf) are indirect answers from which an answer to the question can be deduced via Gricean reasoning.

2.2.2.2. Syntactically Isomorphic

An alternative way of capturing polar questions and conversation starter questions is to argue that they are syntactically the same. In both types of questions, the MI particle is attached to the IP. All the alternatives that are generated are IP level alternatives. There are two core assumptions in this approach. First, alternatives are always restricted by the context. Second, the complement of the question nucleus is always a salient

alternative. In this theory, then, a question where MI is placed at IP level is interpreted as a polar question when the context is empty because the only possible alternative is the complement of the proposition in the question nucleus; hence, {p, ¬p}. In richer contexts, polar questions are interpreted as conversation starters. For example, in a context where the question under discussion is the type of activities one does, a question like "*Do you play golf?*" is interpreted as a set of alternative propositions that include all the salient activities (say, jogging, climbing, etc.). One crucial point that distinguishes this view from the previous view is that answers like (46b) (my husband plays golf) are no longer indirect answers. They automatically become part of the denotation of the question since the alternatives generated are IP level alternatives.

Whether the linearly isomorphic approach is better or worse than the syntactically isomorphic approach is not clear at this point. They can both capture the facts within the scope of this paper. Therefore, I leave the question open and return to the analysis of alternative questions.

2.2.3 Alternative Questions

Alternative questions in English can be generated by placing a set of disjoint elements inside a polar question.

(51) Do you want TEA or COFFEE.

Although (51) is linearly ambiguous between a polar question and an AltQ, the two meanings can be disambiguated by their different prosodic structures.

In Turkish, on the other hand, a set of disjoint elements inside a polar question can never be interpreted as an AltQ.

(52)	Ali	çay	veya	kahve	iç-er	mi?
	Ali	tea	or	coffee	drink-AOR	MI
	Does Ali drink coffee or tea?					

(52) is always interpreted as an ordinary polar question meaning roughly something like "*Does Ali drink anything?*"

Han & Romero[32] show that inverted negation blocks AltQ readings in English. (53) cannot be interpreted as an AltQ.

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32 Chung-hye Han and Maribel Romero, "Negation, Focus and Alternative Questions," in *WCCFL 20: Proceedings of the 20th West Coast Conference on Formal Linguistics*, ed. Karine Megerdoomian and Leora Anne Bar-el (Presented at the WCCFL 20, Somerville, MA: Cascadilla, n.d.), 101-114.

(53) Didn't John drink tea or coffee?

They propose that this is a side effect of the focus on polarity. They argue that AltQ readings are established because of contrastive focus on disjuncts. Inverted negation includes focus on polarity which intervenes and therefore a contrastive focus on the alternatives is not licensed. If on the right track, this serves as independent evidence for focus in polar questions in Turkish. The analysis proposed here suggests that polar questions are established by focusing the polarity of a clause (alternatively focusing the IP). This focus blocks any focus on lower phrases to be uninterpreted. Therefore, we never get AltQ readings in Turkish polar questions when there is a set of disjuncts in the question.

Turkish uses a different strategy than English to establish AltQs. AltQs in Turkish consist of two parallel clauses. Gracanin-Yüksek[33] argues that they consist of CP disjuncts with ellipsis in the second clause.

(54) Ali ÇAY mı iç-ti KAHVE mi?
Ali tea MI drink-PAST coffee MI
Did Ali drink TEA or COFFEE?

Following Gracanin-Yüksek, I propose that AltQs in Turkish consist of two Narrow Focus Questions with some ellipsis. Hence the full form of (54) is more or less like in (55).

(55) Ali ÇAY mı iç-ti. Yoksa, Ali KAHVE mi iç-ti.
ali tea MI drink-PAST OR Ali coffee MI drink-PAST
Was it coffee that Ali drank or was it tea that Ali drank?

An AltQ in Turkish, then, must denote the union of the two set of sets established by the two disjuncts. More precisely, an AltQ with two disjuncts[34] A and B denotes (56).

(56)

- Ordinary semantic value of an AltQ $[\![A]\!]^0 \cup [\![B]\!]^0$
- Alternative value of an AltQ $[\![A]\!]^a \cup [\![B]\!]^a$

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33 Gračanin-Yüksek, "Alternative Questions in Turkish."

34 Note that the disjuncts here are questions (CPs).

Compositional derivation of narrow focus questions has already been provided above. Ordinary semantic value of a narrow focus question is nothing distinct from the proposition denoted by the question nucleus. So, the ordinary semantic values of the two clauses in (54) is given in (57).

(57) {*λw'*. drink (*ali*, *tea*)(*w'*)} and {*λw'*. drink (*ali*, *coffee*)(*w'*)}

Union of the two sets in (57) yields the ordinary semantic value of the AltQ in (54); hence (58).

(58) {*λw'*. drink (*ali*, *tea*)(*w'*), λw'. drink (*ali*, *coffee*)(*w'*)}

AltQs, just like any other question type, have an alternative semantic value. The alternative semantic value of (54) is the union of the two sets denoted by the two narrow focus questions in (54). The crucial question is what the alternative sets denoted by each of the narrow focus questions should look like. Normally, a narrow focus question like (59) would have an alternative semantic value where each of the alternatives in the context are included in the alternative set.

(59) Ali ÇAY mı içti?
ali tea MI drink-PAST
Was it tea that Ali drank?

In a context where the salient alternatives of tea are {tea, coffee, coke}, the alternative semantic value of (59) would be as in (60).

(60) {*λw'*. drink (*ali*, *tea*)(*w'*), *λw'*. drink (*ali*, *coffee*)(*w'*), *λw'*. drink (*ali*, *coke*)(*w'*)}

Similarly, in the same context, the second narrow focus question in (54) denotes (60) as its alternative semantic value. The union of the two alternative sets again yields (60). This is a problem because the desired denotation of an AltQ with two overt alternatives is a set with two alternatives not three (or more). In other words, the alternatives need to be restricted to the ones that are explicitly stated by the question.

I argue that this problem can be solved by the theory proposed here plus Gricean reasoning. When more than one alternative is explicitly stated, the context is shrunk to include only the alternatives that are explicitly stated. Here is an example of Gricean reasoning:

- Sam said TEA or COFFEE. She stated two alternatives explicitly. If there was a third option, she would overtly state it. Therefore, there must be only two options.

The Gricean reasoning applies on the contextually salient alternatives. Therefore, there is no need to modify the theory of deriving questions. Additionally, the denotation in (60) is not totally out. There are cases when an AltQ like (54), where tea and coffee are explicitly mentioned, denotes something like (60). Consider the following context:

- Susan and her daughter Cindy are talking.

(61) S: Do you want some TEA or COFFEE?
C: Actually, I want some COKE.
S: Oh yes, I forgot, we have some of that. / No, you are not allowed to drink that.

In (61), Cindy's response is felicitous. Therefore, COKE must be in the alternative set generated by the question. However, Susan's response to Cindy clarifies that it was not in Susan's alternative set. So, for Susan, the context allows only two salient alternatives at the time when she asked the question. On the other hand, for Cindy, the context allows three salient alternatives. The theory of questions proposed here can generate both sets with relevant differences across speakers.

The number of alternatives generated by an AltQ is then restricted by pragmatic factors rather than semantics per se. When facing an AltQ like (54), a speaker might choose to restrict the number of alternatives to the ones stated explicitly via Gricean reasoning. Alternatively, she can choose to expand the domain of alternatives by bringing a new alternative on the table. Whether the discourse continues felicitously or not is dependent on the accommodation rates of the speakers. For example, by saying "*Oh yes, I forgot, we have some of that*," Susan chooses to accommodate the third alternative. Or, by saying *"No, you are not allowed to drink that*," Susan explicitly denies that alternative from the question.

To summarize then, AltQs in Turkish are generated via a union of two narrow focus questions. The restriction of the alternatives raised by AltQs to the ones that are explicitly stated is a pragmatic one.

2.3. Section Summary

In this section, I proposed a bidimensional semantics for questions. Alternatives in constituent questions are generated by indeterminate pronouns that are inherent alternative generators. On the other hand, in questions with the MI particle, alternatives are generated by focus. All the question types and their denotations predicted by the theory can be summarized as in (62).

(62)

- *Constituent Questions*
  - Ordinary Semantic Value = {λ*w'*.came(*x*)(*w'*): human (*x*)(*w*)}
  - Alternative Semantic Value = {λ*w'*.came(*x*)(*w'*): human (*x*)(*w*)}
- *Narrow Focus Questions*
  - Ordinary Semantic Value = {λ*w'*.came(*ali*)(*w'*)}
  - Alternative Semantic Value = {λ*w'*.came(*ali*)(w'), λw'.came(*bill*)(*w'*)}
- *Polar Questions*
  - Ordinary Semantic Value = {λ*w'*.came(*ali*)(*w'*)}
  - Alternative Semantic Value = {λ*w'*.came(*ali*)(*w'*), λw'.¬came(*ali*)(*w'*)}
- *Conversation Starter Questions*
  - Ordinary Semantic Value = {λ*w'*.play golf(*ali*)(*w'*)}
  - Alternative Semantic Value = {λ*w'*.play golf(*ali*)(*w'*), λ*w'*.play tennis(*ali*)(*w'*), λ*w'*.jog(*ali*)(*w'*)}
- *AltQs*
  - Ordinary Semantic Value = {λw'.drink tea(*ali*)(*w'*), λ*w'*.drink coffee(*ali*)(*w'*)}
  - Alternative Semantic Value = {λw'.drink tea(*ali*)(*w'*), λ*w'*.drink coffee(*ali*)(*w'*)}

OR {λ*w'*.drink tea(*ali*)(*w'*), λw'.drink coffee(*ali*)(*w'*), λ*w'*.drink coke(*ali*)(*w'*)}

One crucial point that can be observed from (62) is that narrow focus, ordinary polar, and conversation starter questions have singleton denotations as their ordinary semantic values while constituent questions and AltQs can never have singleton denotations.

3. Answerhood

In the previous section, I analyzed all the questions as sets of ordinary semantic values and alternative semantic values. In other words, all the questions above are sets of alternatives. Empirically, though, there is a striking difference between question types in terms of their compatibility with *yes/no* responses. Constituent questions cannot be responded via a *yes/no* answer while polar questions and narrow focus questions can. Any theory of questions must account for these facts. In this section, I review some of the literature on the interaction of *yes/no* responses and propose an analysis that accounts for the distribution of *yes/no* answers. I also present a theory of answers to show how answers are related to the denotations of questions.

A detailed analysis of polarity response particles has been proposed by Farkas & Roelofsen[35] (*hf.* F&R) in the framework of inquisitive semantics. They treat polar questions as Hamblin/Karttunen sets with two alternatives {p, ¬p}. The two propositions are mutually exclusive and jointly exhaustive. F&R draw attention to the fact that not all alternative sets are available for polarity particle responses. In cases when both of the alternatives are explicitly stated, a *yes/no* answer is not possible.

(63) Is the door open or closed?
  a. *Yes.
  b. *No.

In cases when only one of the alternatives is explicitly stated, it is possible to use *yes/no* answers.

(64) Is the door open?
  a. Yes. → the door is open.
  b. No. → the door is closed.

In order to account for the facts in (63) and (64), they incorporate the idea of highlighting. The crucial idea behind highlighting is that a polar question highlights one of its alternatives. The highlighted alternative roughly corresponds to the one that is explicitly stated by the polar question. So, in (64a), the positive alternative (p) is highlighted whereas in (65b) the negative one (¬p) is highlighted.

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35 Donka Farkas and Floris Roelofsen, "Polar Initiatives and Polarity Particles in an Inquisitive Discourse Model," 2012.

(65)

a. Is the door open? {**p**, ¬p}

b. Isn't the door open? { p, **¬p**}

Polarity particles are anaphoric expressions that either confirm or reject the highlighted antecedent possibilities. An alternative can be an antecedent only when it is highlighted.

A different view on the denotation of polar questions has been proposed by Biezma & Rawlins36 (*hf.* B&R). They argue that the denotations of polar questions (as opposed to alternative questions) are singleton sets. In this case, *yes* confirms the proposition in the singleton set while *no* denies it. In cases when *no* is used, alternatives to the singleton set are derived by a coercion operation.

A common point in both analyses is that they both show that a *yes/no* answer is possible only when one of the alternatives is singled out in one way or another. B&R do this by positing that polar questions denote only one alternative, whereas F&R do it by highlighting one of the alternatives. In other words, F&R make the denotation of questions more complex by incorporating highlighting while B&R simplify it by arguing that the denotation of a question is a singleton proposition.

The analysis of questions provided in the previous section treats questions as double layered sets of alternatives, not merely singleton sets. On the other hand, it does not incorporate any extra mechanism of highlighting or anything similar. Therefore, neither of the F&R and B&R analyses of *yes/no* applies straightforwardly. A new analysis of *yes/no* particles is called for. In the following, I propose a slightly different analysis of *yes/no* particles and their interaction with questions.

I assume that the intuition of singling out one of the alternatives pursued by F&R and B&R is the right one. However, there is no need to introduce extra mechanisms for highlighting or over-simplifying the denotation of polar questions by arguing that they are merely singleton sets. Polarity response particles *yes/no* are propositional anaphors as suggested by Krifka.37 The

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36 María Biezma and Kyle Rawlins, "Responding to Alternative and Polar Questions."

37 Manfred Krifka, "Response Particles as Propositional Anaphors," *Semantics and Linguistic Theory*, no. 23 (August 24, 2013): 1-18.

antecedent has to be a single proposition. Response particles cannot be bound by more than one proposition at the same time. Their use is restricted by the *Singleton Constraint* given in (66).

(66) *Singleton Constraint*
A *yes/no* response is defined only when the denotation of a question can have a singleton-set alternative.

Polarity response particles, then, only interact with the ordinary semantic value of a question due to the *singleton constraint*. This constraint predicts that any question that has an ordinary semantic value that is not a singleton cannot be felicitously responded with yes/no. This makes exactly the right predictions. A quick glance at (62) shows that constituent and alternative questions do not have singleton sets as their ordinary semantic values while other types of questions discussed in this paper do. The prediction is that constituent and alternative questions should not be responded with *yes/no* while the others should. This is exactly what the facts are.

The *singleton constraint* states when a *yes/no* response is defined. However, it does not provide any details about what *yes* and *no* mean. In the following I provide meanings for *yes* and *no* in Turkish.

F&R note that answer particles *yes/no* show cross-linguistic variation. Therefore, the meanings that I provide for *yes/no* below are by no means universal. They are intended to account for the Turkish data discussed throughout. This is not necessarily to say that they cannot be extended to other languages. Nevertheless, I will not attempt that here.

Yes and *No* in Turkish are *Evet* and *Hayır*, respectively. Their functions are listed in (67).

(67) ***Evet*** picks out the singleton proposition denoted by the question and ***accepts*** it.
Hayır picks out the singleton proposition denoted by the question and ***rejects*** it.

Meanings of *evet* "yes" and *hayır* "no" in Turkish are this simple. Nonetheless, an answer to a polar/narrow focus question is usually not that simple. Consider a narrow focus question like (68).

(68) Ali mi gel-di?
Ali MI come-PAST
Did ALI come? (Was it Ali who came?)

One can respond to (68) either by (69a) or (69b).

(69) a. Evet.
Yes.

b. Evet. Ali geldi.
Yes. Ali come-PAST.

In many cases (69b) type answers are used as a response to a *yes/no* question. Descriptively, such answers consist of two parts: i) *the response particle* ii) *the follow-up phrase*. The theory proposed above accounts for the distribution of *response particles*. However, it says nothing about the *follow-up phrase* and how it interacts with the *response particles*. In the following, I answer these questions.

Follow-up phrases in answers like (69b) are established by an answerhood operator that operates on the alternative semantic value of a question. This answerhood operator applies to all types of questions discussed in this paper. There is no direct interaction between *response particles* and *follow-up phrases*. The only relation is compatibility. A *follow-up phrase* cannot contradict the information contributed by the *response particle*.

Two most prominently used answerhood operators in the literature have been proposed by Heim[38] and Dayal.[39] Heim's *answer1* operator applies to the denotation of a question and returns the intersection of all the true propositions. On the other hand, Dayal's entailment based answerhood operator picks out the single alternative that entails all the other true propositions.

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38 Irene Heim, "Interrogative Semantics and Karttunen's Semantics for Know," in *Proceedings of the Israeli Association for Theoretical Linguistics*, ed. Rhona Buchalla and Anita Mitwoch (Jerusalem, 1994), 128-144.

39 Veneeta Dayal, *Locality in WH Quantification*, vol. 62, Studies in Linguistics and Philosophy (Dordrecht: Springer Netherlands, 1996).

(70) Heim (from Beck & Rullman[40])

• *answer1* (w)(Q)= ∩{p:Q(w)(p) & p(w)}

(71) Dayal

• Ans(Q)= ιp[p∈Q∧$^{\vee}$p∧∀p'∈Q [$^{\vee}$p→p⊆p']]

The crucial difference between the two answerhood operators is number: *answer1* does not take number into consideration while Ans(Q) does. *answer1* basically takes Hamblin sets and returns the intersection of all the true propositions. On the other hand, Dayal's (1996) Ans(Q) takes enriched Hamblin sets where plural individuals are also included in the denotation of a question. The difference between the two shows up in cases when the question has a plurality in it. Consider the following question.

(72) Kim-ler gel-di?
Who-PL come-PAST
Who-all came?

By virtue of being plural, (72) establishes a set like in (73).

(73) {*bill, john, john+bill*}

Now, in a situation where only *bill came, answer1* would return the single true proposition in the alternative set. On the other hand, Dayal's number sensitive answerhood operator would not return anything as there is an implicature failure. The implicature in (72) is that more than one person came. In this case, Dayal's answerhood accounts for the data as something like (74) is an infelicitous answer to (72).

(74) Ali gel-di?
Ali come-PAST
Ali came.

Although Dayal's entailment based answerhood does better than Heim's *answer1* for plurals, I adopt Heim's *answer1* as the focus of this paper does not concern number. Additionally, throughout the paper I have treated questions

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40 Sigrid Beck and Hotze Rullmann, "A Flexible Approach to Exhaustivity in Questions," *Natural Language Semantics* 7, no. 3 (1999): 249-298.

as Hamblin sets rather than Hamblin sets with plural individuals. Thus, *answer1* serves well enough for the purposes of this paper.

In the following, I show how the theory of answers developed in this section apply to the questions discussed in the paper. Each type of question is given with the alternative set it generates. Additionally, the true propositions are underlined. Let me start with a constituent question like (75).

(75) Q: Kim gel-di?
kim come-PAST
Who came?

A: Bill gel-di.
Bill come-PAST
Bill came.

Ordinary Semantic Value = {$\lambda w'$.came(*ali*)(w'), <u>$\lambda w'$.came(*bill*)(w')</u>}
Alternative Semantic Value = {$\lambda w'$.came(*ali*)(w'), <u>$\lambda w'$.came(*bill*)(w')</u>}

The answerhood operator and the singleton constraint operate independently. Since the ordinary semantic value of (75) is not a singleton, *yes/no* is not licensed. On the other hand, the answerhood operator operates on the alternative semantic value and returns the true propositions. So, the predicted answer is (76), which is what the answer in (75) denotes.

(76) {<u>$\lambda w'$.came(*bill*)(w')</u>}

Now let me turn to a narrow focus question and show how the theory of answers developed here applies in various contexts. Consider the narrow focus question in (77).

(77) [ALİ]$_F$ mi gel-di?
Ali MI come-PAST
Was it Ali who came?

Ordinary Semantic Value = {$\lambda w'$.came(*ali*)(w')}
Alternative Semantic Value = {$\lambda w'$.came(*ali*)(w'), $\lambda w'$.came(*bill*)(w'), $\lambda w'$.came(*Susan*)(w')}

Context 1
True propositions underlined
{λ*w'*.came(*ali*)(*w'*), λ*w'*.came(*bill*)(*w'*), λ*w'*.came(*Susan*)(*w'*)}

In context 1, the only answer (with a follow-up) can be (78).

(78) Evet. Ali gel-di.
Yes, Ali come-PAST
Yes, Ali came.

In this case, *Yes* is felicitous because the ordinary semantic value of the narrow focus question is a singleton. The follow-up is established by the *answer1* operator, which intersects all the true propositions in the alternative semantic value of the question (a singleton in this case).

Now consider Context 2 for the question in (77).

Context 2
True propositions underlined
{λ*w'*.came(*ali*)(*w'*), λ*w'*.came(*bill*)(*w'*), λ*w'*.came(*Susan*)(*w'*)}

In this context, the only possible answer is (79).

(79) Hayır. Bill gel-di.
No Bill come-PAST
No, Bill came.

Again, *No* is felicitous due to the singleton in the ordinary semantic value. The answerhood operator returns the intersection of all the true propositions in the alternative set.

An interesting case is the answer in Context 3.

Context 3
True propositions underlined
{λw'.came(*ali*)(w'), λw'.came(*bill*)(w'), λw'.came(*Susan*)(w')}

In Context 3, there are two true propositions. One of the true propositions is the singleton denoted by the question. In such contexts (80) is a good answer while (81) is not.

(80) Evet Ali ve Bill gel-di.
Yes Ali and Bill come-PAST
Yes, Ali and Bill came.

(81) *Hayır Ali ve Bill gel-di.
No Ali and Bill come-PAST
Yes, Ali and Bill came.

The reason why (80) is a good answer while (81) is a bad one is pragmatic. *Yes* in (80) confirms the singleton denoted by the question, which is {*λw'*.came(*ali*)(*w'*)}. This is a subset of the information presented by the follow-up, which is {*λw'*.came(*ali*)(*w'*), *λw'*.came(*bill*)(*w'*)}. This does not lead to a contradiction. On the other hand, in (81) *No* rejects the alternative denoted by the singleton. The follow-up however includes it as a true proposition. This leads to a contradiction. Therefore (81) is not an appropriate answer.

The examples above suffice to show how the *response particles* and *follow-up phrases* are used. I conclude this section with an interesting question-answer pair which can be captured by the theory proposed here. Consider the question in (82).

(82) $[\text{ALİ}]_{F}$ mi gel-di?
Ali MI come-PAST
Was it Ali who came?

(83) is a good answer for (82) while (84) is not.

(83) Evet. Ali gel-di. Yanında Bill var.
Yes Ali come-PAST. Next to Bill exist
Yes, Ali came and Bill is with him.

(84) #Evet. Bill gel-di. Yanında Ali var.
Yes Bill come-PAST. Next to Ali exist
Yes, Bill came and Ali is with him.

Both answers consist of *Yes, a direct follow-up, and an indirect follow-up*. Indirect answers in those cases lead to relevant deductions about direct answers. To be more precise, the indirect answer in (83) lets the hearer infer that *Bill came*. The same is true for (84) mutatis mutandis.

Truth conditionally, (83) and (84) are equivalent. They are both true in a context like (85).

(85) *True propositions underlined*
{λw'.came(*ali*)(w'), λw'.came(*bill*)(w'), λw'.came(*Susan*)(w')}

Although (83) and (84) are truth conditionally equivalent, (83) is a good answer while (84) is not. This needs to be accounted for.

In order to properly analyze answers like (83), we must understand the situations in which they are used. The indirect follow-up in (83) serves as additional information. Confronted with an answer like (83), the utterer of the question might felicitously say, "Who is Bill?" This indicates that *Bill* is an alternative but he is not a salient alternative. Therefore, he cannot be in the actual denotation of the question. On the other hand, Ali has to be in the denotation of the question by virtue of being explicitly stated. Therefore, the alternative semantic value of (82) must be something like (86).

(86) {λw'.came(*ali*)(w'), λw'.came(*Susan*)(w')}

The answerhood operator applies to (86) and returns the intersection of all the true propositions. This is realized as the direct follow-up. Although λ*w'*. came(*bill*)(*w'*) is a true proposition, it is not in the question denotation as *Bill* is not a salient alternative. It can be provided as extra information, though.

On the other hand, The answer in (84) is bad because in a context where λ*w'*. came(*ali*)(*w'*) is true it has to be used by the answerhood operator. Therefore, it has to be in the direct follow-up. The answerhood operator cannot leave it out.

To summarize this section, I have proposed that the relation between response particles and follow-up phrases is a compatibility relation. Response particles are propositional anaphors. They can be used only when the denotation of a question includes a singleton as its ordinary semantic value. Follow-up phrases are established by an answerhood operator (Heim's *answer1* in this case) applying to the alternative semantic value. A follow-up phrase cannot contradict the proposition denoted by the response particle.

4. Some extensions

In this section, I sketch two extensions. In the first part, I discuss some data where an inherent alternative generator is overtly focused. In the second part, I show how the theory presented here can be extended to other languages.

4.1. Focus on inherent alternative generators

Indefinites and wh-expressions have been analyzed as inherent alternative generators by Kratzer & Shimoyama,[41] among others. In Turkish, both indefinites and wh-elements can be overtly focused by adjunction of MI. This is both theoretically and empirically interesting. Focus generates alternatives. Then focusing inherent alternative generators should yield alternatives of alternative generators. Let me start with indefinites.

(87) BİRİ mi gel-di?
Someone MI come-PAST
Did someone come?

(87) can be naturally responded with (88) and (89).

(88) Hayır. Kimse gel-me-di.
No Nobody come-NEG-PAST
No, nobody came.

(89) Evet. Ali gel-di.
Yes Ali come-PAST
Yes, Ali came.

In the Hamblin framework adopted here, the denotation of a question is a set of alternative responses. Therefore, by just looking at the answers in (88)-(89), we get a schematic set like in (90).

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41 Kratzer and Shimoyama, "Indeterminate Pronouns: The View from Japanese."

(90)

$$\left\{ \begin{array}{l} \text{Evet} \left\{ \begin{array}{ll} \text{Zeynep} & \text{geldi} \\ \text{Ayşe} & \text{geldi} \\ \text{Nehir} & \text{geldi} \\ \text{Susan} & \text{geldi} \end{array} \right\} \\ \\ \text{Hayır } \{\neg\exists \text{ geldi}\} \end{array} \right\} \quad \textit{geldi} \text{ “came”}$$

(90) is a set of sets of propositions. I argue that the denotation of the question (87) is not a set of sets of propositions, though. While {nobody came} is one of the alternatives raised by (87), {Ali came, John came, ...} are not. The actual alternative set generated by (87) is something like (91).

(91) {someone came, nobody came}

The focus is on *someone*, which is a generalized quantifier. The alternatives generated are generalized quantifiers. The crucial question is, then, “How do we get answers like (89)?”

I argue that this is a pragmatic effect. The alternatives like {Ali came, Bill came, ...} are generated by the implicit question “Who came?” Consider the following context:

- Tuba and Zeynep hear the door opening and closing. Tuba asks Zeynep the question in (87). Zeynep is sure that someone came in but she does not know who that person is. So, she can felicitously respond with (92).

(92)	Evet,	biri	gel-di	ama	kim?
	Yes	someone	come-PAST	but	who

So, how can we have an answer like (92) and why don’t we have an answer like (93)?

(93)	#Evet,	biri	gel-di	Ali	geldi.
	Yes	someone	come-PAST	Ali	come-PAST

Answers like (92) are possible because humans, as rational beings, can reason what the next question will be in a discourse. So, in a discourse where speaker A asks, “*Did someone come in?*” and Speaker B responds, “*Yes, someone came in*,”

the next reasonable question would be "*Who*?" This is how we get answers like (92). On the other hand, answers like (93) are dispreferred (not completely out, though) because of the maxim of quantity. "*Ali came*" entails "*someone came*." Therefore, there is no need to say "*someone came"* because the next move in the discourse is more specific and therefore preferred over the other one.

The question now is, "How are sets like {someone came, nobody came} derived?" Such sets can be derived by focusing the generalized quantifier *someone*. In the Kratzer & Shimoyama's framework, the generalized quantifier *someone* is treated as in (94).

(94) $[\![\text{someone}]\!]^0 = \{\lambda P \lambda w'.\ \exists a[a \in \{x\text{: x is human}\} \ \&\ P(a)(w')=1]\}$

So, the alternative semantic value of (94) is derived in the following way.

(95) $[\![[\text{someone}]]\!]^a = \{\lambda P \lambda w'.\ \exists a[a \in \{x\text{: x is human}\} \ \&\ P(a)(w')=1],$
$\lambda P \lambda w'.\ \neg\exists a[a \in \{x\text{: x is human}\} \ \&\ P(a)(w')=1]\}$

This set of generalized quantifiers compose with the denotation of the verb *come* in a point-wise manner.

$$[\![\textit{came}]\!]^a = \{\lambda x \lambda w'.\text{came}(x)(w')\}$$

$[\![TP]\!]^a = \{\lambda w'.\exists a[a \in \{x\text{: x is human}\} \ \&\ \text{came}(a)(w')],\ \lambda w'.$
$\neg\exists a[a \in \{x\text{: x is human}\} \ \&\ \text{came}(a)(w')]\}$

This set of alternative propositions is fed to Q (which is an identity function). The result is a set of propositions of the form (96).

(96) $\{\lambda w'.\exists a[a \in \{x\text{: x is human}\} \ \&\ \text{came}(a)(w')],\ \lambda w'.$
$\neg\exists a[a \in \{x\text{: x is human}\} \ \&\ \text{came}(a)(w')]\}$

This is the desired alternative set. The other interesting piece of data is overt focus on wh-elements as in (97).

(97) KIM mi düş-tü?
Who MI fall-PAST
WHO fell?

These types of questions are primarily used as clarification questions. For example (97) can be used in the following context.

- Tuba asks Nehir, "Who fell?" The room is a little crowded and Nehir cannot clearly hear the wh-word. In order to make sure she understands the question, she asks the question in (97).

The alternatives that can be considered as good answers to (97) are actually questions. For example, (98) is a good answer for (97).

(98) Hayır. Ne düş-tü?
No. What fall-PAST

Schematically, the alternative semantic value of (97) is a set of questions like {who fell, what fell, ...}. Prima facie, this is a higher order set (a set of sets of propositions). Nevertheless, I propose that such questions can be analyzed without referring to higher order sets. The overtly focused phrase in (97) is *kim* "who." The alternatives generated are similar wh-words like *ne* "what." The ordinary semantic value of *kim* in this framework is (99).

(99) $[\![kim]\!]^0 = \{x \in D_e : \text{human}(x)(w)\}$

Similarly, ordinary semantic value of *ne* is (100).

(100) $[\![ne]\!]^0 = \{x \in D_e : \text{non-human}(x)(w)\}$

When a wh-word like *kim* is focused, the focus is on the restriction. So, the alternative semantic value of *kim* is (101).

(101) $[\![kim]\!]^a = \{x \in D_e : \text{human}(x)(w), x \in D_e : \text{non-human}(x)(w)\}$

This set combines with the VP as usual. The alternative semantic value of (97) is then (102).

(102) $[\![KM\ mi\ düştü]\!]^a = \text{fell}(\{x \in D_e : \text{human}(x)(w), x \in D_e : \text{non-human}(x)(w)\})$
$= \{\lambda w'.\text{fell}(x)(w') : \text{human}(x)(w), \lambda w'.\text{fell}(x)(w') : \text{non-human}(x)(w)\}$

In this section, I have analyzed two cases where an inherent alternative generator is overtly focused. I argued that they can be captured within the limits of the theory of questions advocated in this paper without referring to any higher order alternative sets.

4.2. Other languages

The main proposal of this paper can be summarized as in the following: i) Every question has an ordinary semantic value and an alternative semantic value. ii) There are at least two ways of generating alternatives in question denotations. One strategy is to use inherent alternative generators like wh-words (or Hamblin's[42] adformula for polar questions). The other strategy is to use focus. iii) A question can be answered with response particles if it denotes a singleton set of propositions as one of its semantic values. In the following, I discuss how this theory might be extended to capture other languages.

First of all, the analysis of wh-questions is not novel. It is what has been proposed in the alternative semantics framework by Hamblin,[43] Kratzer & Shimoyama,[44] among others. Alternatives are generated by wh-words. This applies to all the languages that I am aware of. Whether wh-elements denote sets of alternatives in all languages is a larger question that I am not aiming to answer in this paper. The only novelty is the proposal that a wh-question has an ordinary semantic value as well as an alternative semantic value. They are trivially the same. I have not proposed any evidence for or against this bidimensional semantics for wh-questions. It just comes as a side effect of the overall theory. It is not clear at this point whether it is a positive, negative, or neutral side effect. I leave it as an open question for future work.

The second and the semi-novel proposal is the use of focus to generate alternatives. Dukova-Zheleva[45] presents very similar data from Bulgarian. Bulgarian uses the particle *li* to establish narrow focus questions similar to Turkish narrow focus questions. Following Kamali,[46] I extend the use of focus to generate other types of questions (polar questions and conversation starter questions). The analysis proposed here can easily be extended to languages like Bulgarian. On the other hand, it is neither clear nor very wise at this point to argue that all languages use focus to generate questions. I propose that this is a strategy

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42 Hamblin, "Questions in Montague English."

43 Hamblin, "Questions in Montague English."

44 Kratzer and Shimoyama, "Indeterminate Pronouns: The View from Japanese."

45 Galina Dukova-Zheleva, "Questions and Focus in Bulgarian" (PhD diss., University of Ottawa, 2010).

46 Kamali, "The Question Particle in Turkish."

made available by the UG and some languages can make use of it. Whether all languages use it or not is an open question worth a survey.

The third proposal is about the interaction of questions and response particles. A *yes/no* answer is felicitous only when the question has a singleton as one of its semantic values. The intuition of singling out one of the alternatives is not new. It has been proposed by Farkas & Roelofsen[47] and Biezma & Rawlins,[48] among others. However, the mechanism of singling out is novel and needs some consideration before it can be extended to other languages.

Consider polar questions. Polar questions in Turkish are generated by focusing the polarity of the clause. Their ordinary semantic values are singletons while alternatives are generated by focus as the alternative semantic value. The singleton value for *yes/no* particles is obtained via the ordinary semantic value. Now, let us consider English. It is not clear whether English uses focus to generate polar questions. In order to show that the theory can be extended to languages that do not employ focus as the alternative generators in questions, I assume that English does not use focus. Let us assume that Hamblin's[49] analysis of polar questions in English is the right analysis. So, English polar questions are established by an adformula that takes the question nucleus and returns a set of two propositions {p, ¬p}.

If polar questions in English are formed as proposed by Hamblin, then we need to find a way of singling out one of the propositions. This is a problem because the denotation of a polar question never has a singleton value in the Hamblin framework.

I propose that this problem can be solved by a simple tweak that leaves Hamblin's proposal mostly intact. The only thing that needs to be modified is the adformula (a lexical item) proposed by Hamblin. The ordinary semantic value of the adformula is an identity function while its alternative semantic value is a set containing the identity function and the function that returns the complement of the proposition in the nucleus.

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47 Farkas and Roelofsen, "Polar Initiatives and Polarity Particles."

48 Biezma and Rawlins, "Responding to Alternative and Polar Questions."

49 Hamblin, "Questions in Montague English."

(103) $[\![adf]\!]^a = \{I\}$

$[\![adf]\!]^a = \{I, D_{adf}\,(\text{'not'})\}$ where I is the identity function.

The lexical item in (103) gives provides the singleton for the response particles and the necessary alternatives for the polar question.

5. Conclusion

In this paper, I have proposed a bidimensional semantics for questions. Every question has an ordinary semantic value as well as an alternative semantic value. Questions denote sets of alternatives. Alternatives can be generated by inherent alternative generators as well as focus. When responding to questions, response particles can be used if the denotation of a question involves a singleton set. Otherwise, *yes/no* answers are undefined.

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