Alternative Semantics for the Hebrew Determiner

Eyze

Olga Kagan and Ilona Spector
University of California, Santa Cruz and Hebrew University of Jerusalem

1. Introduction

In the recent linguistic literature, much attention has been devoted to the semantics and pragmatics of indefinite NPs. One of the issues that have been addressed is how different indefinite determiners in various languages contribute to the interpretation of the NP or of the whole sentence. The purpose of this talk is, hopefully, to make a further contribution to this investigation by examining the semantic properties of the Hebrew indefinite determiner eyze. This determiner can optionally appear in indefinite noun phrases, as is exemplified in (1):

(1) a. Yotam diber im student mehaxug leanglit.
    'Yotam talked with a student from the English Department'.

   b. Yotam diber im eyze student mehaxug leanglit.
    'Yotam talked to some student from the English Department'.

Superficially, the presence of eyze seems to have no truth-conditional effect. Both (1a) and (1b) will be true if and only if there is at least one student from the English Department such that Yotam talked to that student. There seems to be no possible context in which one of the sentences would be true and the other, false. However, we would like to demonstrate that the presence of eyze does affect the semantics of a sentence, at least in some cases.

First, this is revealed in those sentences in which eyze semantically interacts with a quantity-denoting constituent. For instance, consider (2) below:

(2) a. Dani hizmin Smona studentim.
    'Dani invited eight students'.

   b. Dani hizmin eyze Smona studentim.
    'Dani invited about eight students'.

The semantic contribution of eyze in such sentences as (2b) is similar to that of the adverbial approximately. Thus, while (2a) presumably entails that Dani invited at least eight students, according to (2b), he invited approximately eight students. If, in fact, Dani invited seven students, (2a) will be false, but (2b), which contains eyze, will be true. Thus, here, eyze does affect truth conditions.

A further, pragmatic, difference between (2a) and (2b) has to do with the fact that (2a) contributes an implicature according to which the speaker ate not more than ten apples. In (2b), such an implicature is not generated.

It should further be noted that a quantity-denoting expression whose interpretation is affected by eyze need not be a numeral. For instance, in (3) eyze has the same effect as in (2b).

The sentence means that the talk lasted approximately for an hour and leaves open the possibility that the actual duration of the talk was, for example, fifty minutes.

Finally, in some dialects, the approximation contribution of *eyze* can be found in adjuncts that locate the event in time:

(4) bo’i nipageS be-eyze Seva
let's meet in-some seven
'Let's meet at about 7 o'clock'.

The speaker of (4) is suggesting to meet at approximately seven o'clock, not necessarily exactly at seven (a quarter to seven or a quarter past seven would be OK as far as she is concerned).

A proximity meaning component similar to the one triggered by *eyze* in (2) is sometimes contributed by the English determiner *some*, as pointed out by Farkas (2002). This component is present in such sentences as (5) below.

(5) a. **Some ten** years ago the senior author began a study of certain phases.
    b. This is one of **some ten** species within the Tabernaemontaneae classification, with **some** 2% alkaloid content in its leaves.

Further, the fact that the presence of *eyze* can affect truth conditions is revealed in the sentences in which the determiner semantically interacts with a property-denoting constituent.

(6) Dina tikax eyze akamol' ve targiS tov yoter.
    Dina will-take some akamol and will-feel well more
    'Dina will take an akamol and feel better'.

(7) A: Ani reeva!
    I hungry
    ‘I am hungry!’
    B: Kxi eyze tapuax!
    take some apple
    'Take an apple or something!'

For instance, (6) does not entail that it is specifically akamol that Dina will take. According to this sentence, she will take either akamol or some other medicine of a similar kind (namely, one of the widespread analgesics). In other words, the medicine need not instantiate the property *akamol*. In turn, (7) can be uttered in a context whereby a vase with fruit is standing on the table. Speaker B is suggesting that A eat an apple or something relatively similar to an apple; essentially, the suggestion is to take some fruit.

Thus, we see that *eyze* can affect the semantics of a sentence. It should also be noted that this item makes a consistent pragmatic contribution. In particular, its occurrence suggests that it is irrelevant or immaterial, for the purposes of the current discourse, which particular individual / quantity / property satisfies the proposition contributed by the sentence. For instance, according to (1), it is immaterial which student Yotam talked with. Again, the same pragmatic contribution characterizes the singular *some*, as pointed out by Farkas (2002).

Finally, it is important to point out that in addition to the determiner *eyze* that we have been considering, there exists a wh-item *eyze* whose usage is illustrated in (8):

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1 Akamol is a type of analgesic, very common in Israel.
In order to distinguish between these two types of *eyze*, we will use the terms *interrogative eyze* (for the wh-element illustrated in (8)) and *existential eyze*. In what follows, we address the following questions:

- Is it possible to assign a unifying analysis to all the instances of existential *eyze* discussed above?
- If such an analysis can be provided, how do we explain the fact that *eyze* seems to have no truth conditional effect in (1) but does affect the semantics of (2)-(4) and (6)-(7)?
- What is the relation between the existential *eyze* and the interrogative *eyze*?

2. Alternative Semantics

We will propose an analysis for both interrogative and existential *eyze* that is formulated within the framework of Alternative Semantics. Therefore, in this section, we introduce certain principles of Alternative Semantics and closely related frameworks that will be adopted in what follows.

2.1. Hamblin's Semantics for Questions

We will begin with Hamblin's semantics developed primarily in order to formally capture the denotation of interrogative sentences. Hamblin (1973) proposes that *wh*-phrases, such as *who* and *what*, denote sets of individuals. *Who* denotes the set of human individuals and *what*, the set of non-humans. However, Hamblin points out an interrogative like *Who walks?* does not entail that all the humans walk. Rather, this sentence should be interpreted as a set of propositions of the form *Mary walks*, *John walks*, etc.; in other words, it is interpreted as a set of possible answers. The subject in each proposition within this set corresponds to one of the individuals belonging to the set denoted by *who*. Although Hamblin did not use the term Alternative Semantics (the term was introduced later by von Stechow 1989), we can regard his analysis as based on the notion of a set of alternatives. A *wh*-phrase denotes a set. Importantly, this is not a property but rather a set of alternatives, a set of individuals that could potentially satisfy the propositional content of the interrogative clause. These alternatives are projected in a systematic way, and as a result, the whole sentence is interpreted as a set of propositions.

Rooth (1985, 1992) uses the notion of sets of alternatives in order to capture the semantics of focused expressions. He proposes that a constituent can have two distinct semantic values: 'the focus semantic value' as opposed to 'the ordinary semantic value'. The focus value constitutes "a set of alternatives from which the ordinary semantic value is drawn", a set of semantic values "which potentially contrast with the ordinary semantic value" (Rooth 1992:76).

Alternative semantics developed by Rooth has been adopted by other researchers in order to account for additional, not necessarily focus-related phenomena. For instance, it has been used in the analyses proposed for the semantics of such quantificational elements as *at least*, *at most*, *more than*, etc., as well as the adverb *almost* (e.g. Krifka (1999), Penka (2005); see also discussion below). Krifka (1999) proposes that alternatives can be introduced not only by focus but also by certain linguistic expressions. Below, we will propose that *eyze* belongs to this group.

Finally, Kratzer and Shimoyama (2002) develop a system based on Hamblin semantics which captures the interpretation of indefinite NPs. Within this system, all expressions are assumed to receive an 'alternative' interpretation. An indefinite NP is interpreted as a set of contextually relevant individuals that satisfy its descriptive content. For instance, the NP *a student* denotes the set of contextually relevant students. To illustrate, in a context in which only two students are present, Bill and John, the denotation of the NP *a student* will be the set {Bill, John}.

Given that in this system, all constituents are analyzed as denoting sets of alternatives, quantifiers are also treated as operating over alternatives. Kratzer and Shimoyama define the semantics of a number of quantifiers within the 'alternative' framework. For instance, the existential quantifier may operate over a set of either propositional or individual alternatives, as represented in (9a) and (9b), respectively:
With these principles of alternative semantics in mind, we can now turn to a formal analysis of the indefinite determiner *eyze*.

### 3. Alternative Semantics for *Eyze*

We propose that *eyze* triggers an alternative interpretation of a constituent to which it applies. This property unifies interrogative and existential *eyze*. The two items differ in that existential but not interrogative *eyze* triggers existential quantification over alternatives.

#### 3.1. Interrogative *Eyze*

Let us begin with the semantics of *eyze* that is found in interrogative clauses and carries a wh-feature. An example of the interrogative usage of *eyze* is provided in (10):

(10) *eyze* student hizmin et dani?
    which student invited acc Dani
    ‘Which student invited Dani?’

In order to capture the semantics of the interrogative *eyze*, we adopt Hamblin’s approach to wh-items. In such sentences as (10), the phrase of the form [eyze NP] denotes the set of individuals that fall within the extension of the NP. Thus, the phrase *eyze* student in (10) denotes the set of existing students. We also assume that the set of students may be contextually restricted, along the lines of Kratzer and Shimoyama’s proposal for indefinite NPs.

(11) demonstrates how the denotation of (10) is calculated in a context that contains three students, John, Bill and Mary. (11d) represents the semantics of the phrase *eyze* student, and (11e) shows that the whole sentence is interpreted as a set of propositions, namely, “John invited Dani, Bill invited Dani, Mary invited Dani”.

(11) a. [[dani]] = Dani
    b. [[hizmin]] = λxλy[invited(x)(y)]
    c. [[hizmin et dani]] = λy[invited(Dani)(y)]
    d. [[eyze student]] = {x: x is a student} = {John, Bill, Mary}
    e. [[eyze student hizmin et dani]] = λy[invited(Dani)(y)]({John, Bill, Mary}) = {invited(Dani)(John), invited(Dani)(Bill), invited(Dani)(Mary)}

#### 3.2. Existential *Eyze*

Let us now turn to existential *eyze*. We propose that it is similar to the interrogative *eyze* in that it also triggers an ‘alternative’ interpretation of the expression to which it applies. The main difference has to do with the fact that unlike its interrogative counterpart, existential *eyze* contributes an existential operator that quantifies over the set of alternatives. A sentence that contains an expression of the type *eyze* α asserts roughly that there exists an individual within the set of α’s alternatives that makes the proposition true. The first attempt to formally represent the semantics of existential *eyze* is provided in (12).

(12) **The Semantics of Existential *Eyze*: Version 1**
Let p be the propositional content of the sentence S that contains existential *eyze*. Let α be the constituent to which *eyze* applies. Then $$[[S]] = \{ \exists a [a \in [[\alpha]]_s \land p^s = 1] \}$$
where \([[[\alpha]]_\lambda]_\wedge\) is the set of \(\alpha\)'s alternatives, and \(p^*\) is identical to \(p\) except for the fact that within \(p^*\), \(\alpha\) is substituted by \(a\), and \(eyze\) is omitted.

In what follows, we consider the three types of sentences containing existential \(eyze\) that have been illustrated in Section 1.

### 3.2.1. Eyze and Quantity-Denoting Expressions

Let us begin with sentences in which \(eyze\) affects the semantic interpretation of quantity-denoting constituents, such as numerals. This usage of \(eyze\) is exemplified in (13):

(13) Dani hizmin eyze asara studentim.
    Dani invited some ten students
    ‘Dani invited about ten students’.

The sentence means that Dani invited approximately ten students. This interpretation can be captured within Alternative Semantics, if we assume that \(eyze\) triggers an 'alternative' interpretation of \(asara\) (ten) and quantifies over the alternatives. The alternative interpretation of \(asara\) is provided in (14) below. (15) constitutes the first attempt to represent the semantics for (13). \((X\) is a variable over sets of individuals.\)

(14) \([[[asara]]_\lambda]_\wedge\wedge = \{n | n \in \mathbb{N}\}

(15) \{\exists n [n \in [[[asara]]_\lambda]_\wedge \wedge \exists X [student (X) \wedge |X| = n \wedge invited (dani,X)] = 1]\}

(15) roughly asserts that there exists a number \(n\) that belongs to the set of alternatives of \(asara\), such that the proposition \(Dani invited n\) students\) is true. However, it is easy to see that it makes wrong predictions regarding the truth conditions of (13). For instance, it predicts that (13) is true in case Dani invited two students. The number 2 is included in the set of alternatives of \(asara\). This, in turn, means that the truth of the proposition \(Dani invited two students\) guarantees the truth of (13). More generally, (13) follows to be true as long as any number of students is invited by Dani. This conclusion contradicts native speakers' intuitions according to which (13) is only true as long as the number of invited students, if not identical to ten, is close to ten. Therefore, in order to formalize the semantics of (13) correctly, it is necessary to modify (15) in a way that would capture this proximity component.

The notion of proximity within Alternative Semantics has already been employed in the literature, for instance, in the context of the semantics of \(almost\) (Penka 2005, Nouwen 2006). Thus, Penka proposes the following truth conditions for \(almost\) (\(\approx\) stands for the "close by" relation and for the restrictor variable):\n
(16) \([[[\text{almost}]]] = \lambda w.\lambda p.<s,t> . \exists q [ q \approx p \wedge q(w)] \wedge \neg p(w)\)

Under this approach, if \(almost\) is applied to a proposition \(p\), the resulting proposition is true iff \(p\) is false and there is a proposition which is close to \(p\) and which is true. To illustrate, (18b) below represents the truth conditions for (17). (18a) provides the set of propositions that constitute "close by" alternatives for \(p\):

(17) Almost 100 people died of the disease.

(18) a. \{p | p = that n people died of the disease, 90\leq n\leq 110\}
    b. n people died of the disease, 90\leq n\leq 110 \wedge \neg(100 people died of the disease)

The semantics of \(eyze\) is definitely not identical to that of \(almost\). However, \(eyze\) is similar to \(almost\) in that it triggers existential quantification over a set of "close by" alternatives.
We are now in a position to modify the logical form in (15) in a way that would capture correctly the truth conditions of (13). Let $[[\alpha]]_PA$ be a set of $\alpha$'s proximal alternatives, i.e. alternatives that stand to $\alpha$ in a "close by" relation. The revised version of the logical form of (13) is provided in (19):

$$\exists n \left[ n \in [[\text{asara}]]_PA \land \exists X \left[ \text{student} (X) \land |X| = n \land \text{invited} (\text{dani},X) \right] = 1 \right]$$

The range of entities that count as proximal alternatives of a numeral will depend on the quantity it encodes, as well as on the context. For example, in two different contexts, C1 and C2, the set of proximal alternatives for asara (ten) may be as in (20a) or (20b):

$$[[\text{asara}]]_PA^{C1} = \{n \mid 8 \leq n \leq 12\}$$
$$[[\text{asara}]]_PA^{C2} = \{n \mid 7 \leq n \leq 13\}$$

(21) constitutes a modified version of the semantic analysis of eyze, which involves the notion of proximal alternatives:

(21) The Semantics of Existential Eyze: Version 2
Let $p$ be the propositional content of the sentence $S$ that contains indefinite eyze. Let $\alpha$ be the constituent to which eyze applies. Then

$$[[S]] = \{\exists a \left[ a \in [[\alpha]]_PA \land p^a = 1 \right]$$

where $[[\alpha]]_PA$ is the set of $\alpha$'s proximal alternatives, and $p^a$ is identical to $p$ except for the fact that within $p^a$, $\alpha$ is substituted by $a$, and eyze is omitted.

3.2.2. Eyze and Property-Denoting Constituents

We have seen in Section 1 that eyze may affect the interpretation of a sentence without interacting with a quantity-denoting expression. A relevant example is provided in (22):

(22) Dina tikax eyze akamol'.
Dina will-take some akamol
'Dina will take an akamol'.

As stated above, the truth conditions of (22) are satisfied even if Dina does not take akamol but rather takes an analgesic of a different type. This suggests that eyze interacts semantically with a property-denoting constituent. We propose that in such sentences as (22), eyze quantifies over the set of proximal alternatives of the highest property-denoting projection within the NP. In (22), this is the constituent akamol. The logical form of (22) is the following:

$$\exists P \left[ P \in [[\text{akamol}]]_PA \land \exists x \left[ P(x) \land \text{will-take} (\text{dina},x) \right] = 1 \right]$$

What kind of entities does form a set of alternatives of a property-denoting expression? At this stage, only one restriction seems to be present: the members of the set of alternatives must be of the same semantic type as the original value. However, this would be too unrestricted. Thus, it would mean that the set of alternatives of the N' akamol includes the property of being a dog, the property of being a doctor, the property of being blue, etc. This is not a desirable result. Intuitively, the properties included in the set of alternatives are expected to be in some sense "of the same kind" as the 'ordinary' denotation of the constituent. What counts as a property of the same kind may depend on the context and on the complexity of the constituent involved. We believe that typically, the set of alternatives of a common noun or an adjective is the set of all the properties denoted by its taxonomic sisters. Thus, the set of alternatives of the N (or N') apple is the set of properties each of which is a property of being a certain kind of fruit. Analogously, the 'alternative' interpretation of akamol is the set of properties that correspond to different types of medicines.
Then what about proximal alternatives? How can we capture this proximity relation? In the case of numerals, the notion of proximity is easier to define, since numbers can be treated as values on a scale. As a result, it is possible to talk about values that are located more or less close to each other. However, it is not easy to conceive of such properties as apple, pear and peach as being ordered on a scale. Developing a detailed formal approach to the notion of proximity when applied to alternatives of a property type is beyond the scope of this paper. Below, we only propose a direction for such an analysis. Let us assume that the denotation of common nouns can be decomposed into a cluster of features. For instance, the property dog can be decomposed into a cluster of characteristics, such as is an animal, is a mammal, has four legs, has two ears, can bark, etc. Proximal alternatives would then be those alternatives that share a sufficient amount of characteristics with the original property. Note that while the properties and the characteristics themselves are not ranked on a scale, the different quantities of characteristics are. The higher the number of shared characteristics, the closer an alternative is considered to be to the original. A property that shares with the 'ordinary' denotation five characteristics is closer to it than a property that shares with it only two characteristics. It should be noted, however, that proximity is not only determined by the number of shared characteristics. Typically, proximal alternatives must share those characteristics that are most salient and are considered to be relevant in the given context. In the case of akamol, the set of proximal alternatives is most likely to include properties that involve such characteristics as is a medicine, relieves pain, reduces fever, and not, for example, having the same shape and color. We can thus say tentatively that the set of proximal alternatives of a property-denoting expression will include properties that share a sufficient number of salient or contextually relevant characteristics with the original, 'ordinary' denotation. Just as in the case of numerals, the range of entities that count as proximal alternatives of a property-denoting constituent is context sensitive. We leave the formulation of a more elaborated definition for further research.

3.2.3. Eyze and a Set of Individuals

Finally, let us consider sentences in which eyze seems to have no truth conditional effect, such as (24):

(24) Yotam diber im eyze student.
Yotam talked with some student

We propose that eyze found in (24) is exactly the same lexical item with exactly the same semantics as the eyze that we have considered in the two previous sections. The fact that it does not seem to affect the truth conditions of the sentence is due to the 'ordinary' semantics of the constituent to which it applies.

We assume that an indefinite NP, under its ‘ordinary’ denotation, contributes a variable which gets bound by existential closure (or by another operator), along the lines of Heim (1982). Following Kratzer and Shimoyama (2002), we further assume that the 'alternative' interpretation of such an NP is the set of individuals that constitute the possible values for the variable in the given context. We propose that in (24), eyze triggers an 'alternative' interpretation of the NP student (a student) and existentially quantifies over the alternatives. The semantics of (24) is as follows:

(25) \{\exists x [x \in [[a student]]_A \land \text{talked-to (yotam, x)} = 1]\}

We can now see why, in spite of its regular semantic contribution, eyze seems not to affect the truth conditions of such sentences as (24), i.e. sentences in which it applies to a variable-denoting expression. Compare (25) to (27) below, which is the logical form of (26). ((26) is a counterpart of (24) that does not contain eyze.)

(26) Yotam diber im student (exad)
Yotam talked with student one
Yotam talked with a student.
(27) \exists x [\text{student (x)} \land \text{talked-to (yotam, x)}]
While the logical forms in (25) and (27) are not identical, it can be seen that they render the same truth conditions. (27) asserts that there is at least one student that Yotam talked to. According to (25), there is at least one individual that belongs to the set of alternatives of the NP *a student*, such that Yotam talked to that individual. The set of alternatives consists of contextually relevant students. If we assume that the domain of quantification is always contextually restricted (e.g. Schwarzschild 2002), we conclude that the existential quantifier in (27) also ranges over contextually relevant students. This, in turn, means that the two logical forms render identical truth conditions. (24) and (26) follow to be true in exactly the same situations, in particular, iff there is at least one contextually relevant student to whom Yotam talked.

Thus, we have provided an explanation for the fact that in (24), the presence of *eyze* does not seem to affect the truth conditions while maintaining a unified account of all the instances of existential *eyze*. This determiner always existentially quantifies over the members of a set of alternatives. Whether or not its presence will change the truth conditions of a sentence depends on the type of the constituent to which it applies.

However, in one respect, the contribution of *eyze* in (24) seems to differ from that in the sentences considered previously. In the sentences discussed in the previous sections, *eyze* quantified over *proximal* alternatives. In (24), we deal with a set of alternatives in general. The problem is that in such cases, the notion of proximity cannot be applied. The original, 'ordinary' denotation here is a variable, and the alternatives are the possible values for this variable. It is clearly impossible to say that some values are "closer" to the original denotation than the others.

One way to approach this problem is to give up a unified account of all the instances of existential *eyze* and divide it into two types. One type applies to quantity- and property-denoting constituents and quantifies over proximal alternatives. The other type, exemplified in (24), quantifies over (any) alternatives of an existential NP. There are several factors, however, which make it preferable to maintain a unified account of existential *eyze*. Firstly, both (24) and sentences discussed in sections 3.2.1-3.2.2 involve a non-interrogative usage of *eyze*, which functions as an indefinite determiner, and providing a unifying analysis of all these usages seems to be desirable. Second, in all these cases, *eyze* carries the same colloquial flavor (which does not characterize its interrogative counterpart). Again, this suggests that the same phenomenon is involved. Finally, in all the sentences in question, including (24), *eyze* makes the same pragmatic contribution: it contributes the immateriality meaning component, which has been mentioned in Section 1.

In order to maintain a unified account of existential *eyze*, we propose that this lexical item need not quantify over *proximal* alternatives. Rather, the quantifier it contributes ranges over a set of proximal alternatives if this set if defined, and over the simple set of alternatives if not. This approach to existential *eyze* is formalized in (28), a modified variant of (12):

(28)  **The Semantics of Existential *Eyze*: Final Version**

Let p be the propositional content of the sentence S that contains indefinite *eyze*. Let α be the constituent to which *eyze* applies. Then

\[ [[S]] = \{ \exists a \in [[\alpha]]_{PA} \land p^a = 1 \} \]

If \([[[\alpha]]]_{PA}\) is undefined, then

\[ [[S]] = \{ \exists a \in [[\alpha]]_{A} \land p^a = 1 \} \]

where \([[\alpha]]_{A}\) is the set of α's alternatives, \([[\alpha]]_{PA}\) is the set of α's proximal alternatives, and \(p^a\) is identical to p except for the fact that within \(p^a\), α is substituted by a, and *eyze* is omitted

4. Conclusion

We have investigated the semantic properties of the Hebrew indefinite determiner *eyze*. We argued that the presence of this determiner affects the semantics of the sentence and developed an analysis of its semantic contribution within the framework of Alternative Semantics. This analysis both accounts for the truth conditional effect of *eyze* and makes it possible to capture the semantic relation between
the existential *eyze* and its interrogative counterpart. Both determiners trigger an 'alternative' interpretation of a constituent; however, only existential *eyze* introduces existential quantification over the alternatives.

References


