COMPARATIVE MARKERS AND STANDARD MARKERS

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1 Nomenclature

1.1 Comparative Markers, Standard Markers and Standard Phrases

The sentence in (1) serves to illustrate the descriptive terms in the title of this paper:

(1) Jack is <u>more</u> anxious <u>than</u> Jill (is).

More is a COMPARATIVE MARKER and *than* is a STANDARD MARKER. I imagine the term "standard marker" comes from the idea that Jill is a standard relative to which we consider Jack anxious. I will call a phrase headed by the standard marker, in this case *than Jill* or *than Jill is*, a STANDARD PHRASE.

The terms "comparative marker" and "standard marker" are used in Stassen's (1985) typology of comparative constructions, a typology based on some 110 typologically diverse languages. The categories of the typology are defined in terms of the form of the Standard Phrase as well as the meaning of the standard marker, as demonstrated by its use outside the comparative. By contrast, the comparative marker plays no role in Stassen's typology. He does, however, observe a curious connection between the type of Standard Phrase used and the presence of a comparative marker. While comparative markers are rare among the languages he looked at, they are rather common among what are called "particle comparatives". In a particle comparative, the Standard Phrase is not a conjoined clause, and the standard marker is not a case-marker, nor is it a verb or a preposition found elsewhere in the language. *than* is a particle and (1) above is a particle comparative. So English exemplifies the correlation that Stassen (1985:28) reported but was unable to explain. Much has been learned in the intervening years about the syntax and semantics of comparatives, and so it may be interesting to (re)ask the question:

> (2) What connection, if any, is there between the presence of a comparative marker and the syntax or semantics of the Standard Phrase?

In this paper, I will address this question through an investigation of Hebrew. Hebrew is a language in which comparatives can be formed with a comparative marker and no standard marker or with a standard marker and no comparative marker or with both types of markers. The advantage of looking at Hebrew is that it will lead us to say something about the meanings of a comparative marker, a standard marker and most importantly, how they are able to work together.

The question in (2) and Stassen's brief discussion suggests the possibility of a simple correlation whereby one type of standard marker entails the presence of a comparative marker while another type entails the absence of a comparative marker. Below we will see an example of a type of standard marker that entails the presence of a comparative marker. And we'll see an example of a standard marker that at first appears incompatible with a comparative marker. However, as things develop, it will turn out to be possible to have a comparative marker in conjunction with this latter type of standard marker through a process I'll call "quantifier domain adverbialization". The idea that comparative markers might emerge where they are not expected or needed will be motivated by our study of Hebrew. However, the literature on Chinese, Hindi, Japanese and Turkish seems to suggest a similar pattern. These are languages that are often described as languages where no comparative marker is used. Nevertheless, here and there one finds references to an optional comparative marker for each of these languages (see Hofstetter (2009:fn3) on Turkish, for example).

Comparative markers are plausibly functional heads while Standard Phrases are often analyzed as a type of adverbial. So the question in (2) is a specific case of a more general question to do with functional heads and adjuncts with related meanings. Following the analysis of Hebrew we'll briefly discuss that broader perspective.

The comparative in (1) includes a comparative marker and a Standard Phrase. There are comparatives in which one or the other of these is not seen. The next two sections are devoted to introducing labels for these types of comparatives.

1.2   Bare Comparatives

According to the DegP analysis (Abney 1987, Corver 1990), the comparative marker heads a functional projection and takes a lexical, AP, complement:

```
        DegP
        /  \
     Deg    AP
      |      |
     more  anxious
```
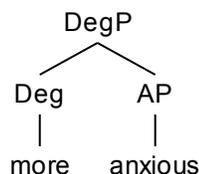
This structure is parallel to and inspired by the syntax of DPs:

```
              DP
             /  \
            D    NP
            |    |
           the  frogs
```
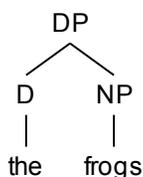
When the plural noun phrase *frogs* fills an argument position (*We ate frogs*), we call it a "bare plural" or a "bare NP" or a "bare plural NP". So I propose that we call a comparative without a comparative marker, such as the one in (3) below, a BARE COMPARATIVE or a BARE (COMPARATIVE) AP:

(3) Taroo-wa [Hanako-yori(mo)]   kasikoi.   (Bhatt & Takahashi to-appear)
     Taro-Top   Hanako-than   smart
      'Taro is smarter than Hanako.'

Whether or not we think there is an empty comparative marker in (3) above is a matter of analysis, on a par with the question of whether some bare plurals have empty determiners or not. And one can assert that a given language has no DPs and still use the term "bare plural" to describe noun phrases without determiners. Likewise, we may eventually want an analysis of (3) that makes no use of Degree Phrase and still we will call (3) a "bare comparative".

From the perspective of this new terminology, we might approach the question of comparative markers and standard markers by asking:

(4) Do certain types of Standard Phrases license bare comparatives and if so, how?

1.3 Incomplete Comparatives

Examples (5) and (6) below are comparatives that lack a Standard Phrase:

(5) a. high**er** education   (Curme 1931:508)
     b. the **more** complex problems of life

(6) a. {Come out onto the porch.} It's cool**er** here.   (Sheldon 1945)
     b. {I've rewritten this sentence.} Do you like it bett**er**?

Sheldon (1945) makes an important distinction between the examples in (5), which she calls ABSOLUTE COMPARATIVES following Curme (1931), and the examples in (6) which she calls INCOMPLETE COMPARATIVES. Sheldon points out that for the examples in (6) "the completion is simple and the comparative feeling is there as it is not in the absolute comparative". For (6)a, she offers "than inside" as an implied completion. For (6)b, she offers "than you did before". These are both intuitively plausible ways of understanding the comparatives in (6). The way Sheldon expresses the completions suggests the idea that the Standard Phrase has been elided. That seems wrong to me, as there is no antecedent for the ellipsis in the discourses provided nor does one seem necessary. The behavior of incomplete comparatives is rather more like predicates with

implicit arguments. And so one might say that the examples in (6) have IMPLICIT standards or implicit Standard Phrases.

   Incomplete comparatives will figure in our discussion below with the following logic. If in a given language, bare comparatives are possible and are licensed by a Standard Phrase, as (4) above contemplates, and if implicit Standard Phrases are really 'not there'[1], then it will be impossible to form a bare comparative with an implicit Standard Phrase, or in other words, an incomplete, bare comparative.

1.4   Summary

By way of summary, I offer the following terminological key:

Comparative marker	Jack is ***more*** anxious than Jill.
Standard marker	Jack is more anxious ***than*** Jill
Standard Phrase	Jack is more anxious ***than he used to be***
Bare comparative	**Taro is smart than Hanako*
Incomplete comparative	*It is cooler over here.*
Differential	Jack is ***a lot*** more anxious than Jill.

The last line of the key introduces a new term, DIFFERENTIAL. The differential describes the size of the difference between the subject and the standard of comparison.

   The example used to illustrate the bare comparative is ungrammatical, despite its similarity to the grammatical Japanese example given above. This brings us back to the issue raised in (2). Can the ungrammaticality of the English bare comparative be explained in terms of properties of English Standard Phrases compared with those of Standard Phrases in Japanese?

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[1] I'm not sure what I need to mean by 'not there'. Possibly, not syntactically projected or represented. For recent discussion of the syntax of implicit arguments see Landau (2010).
[2] The binding index on a quantifier corresponds in some sense to a lambda operator on its sister. There is an appendix to this paper where the rules of interpretation are stated.

2 Syntax and Semantics of Comparatives

I assume "variable enriched logical forms" (VELFs) in which predicates are endowed with argument indices within angled brackets and binding relations are indicated via binding indices on quantifiers. Here's an example:

(7) Velf with DegP

```
                          TP
                 ┌────────┴────────┐
               DP_x               T'
            ┌───┴───┐        ┌─────┴─────┐
          D_x     NP_<x>     T          DegP
           │        │        │      ┌────┴────┐
          some   teacher     is   Deg_d   AdjP_<x,d>
                                    │          │
                                   more     anxious
```
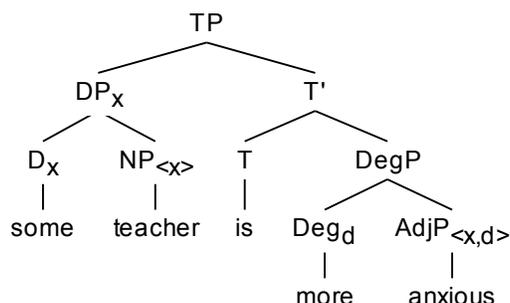
Suppose we interpret this velf relative to a situation and an assignment function. In that case, the right daughter of DP in the tree above will be assigned true if the value assigned to x is a teacher in the situation of evaluation. A rule of quantification applied to the DP collects together all the values of x that make the right daughter of DP true and applies the meaning of *some* to that set.[2] The gradable predicate *anxious* is assumed to denote a two-place relation and so the AdjP has two argument indices. One of those arguments is bound by *more* and one by *some teacher*.

I assume the analysis of comparatives reviewed in Schwarzschild (2008), according to which:

(8) *Jack is more anxious than Jill is* is TRUE if there is some threshold of anxiety that Jack meets or exceeds that Jill doesn't meet or exceed.

The "doesn't" part comes from a null, variable scope negation in the comparative clause, motivated by the interpretation of modals and other quantifiers in comparative clauses (see Schwarzschild 2008 for details). This leads to the following velf:

(9) Jack_x is more_d ($\text{anxious}_{<x,d>}$) ($\text{than}_{<d>,d'}$ Jill_y is NOT $\text{anxious}_{<y,d'>}$)

more is an existential threshold quantifier. The material in the first set of parentheses will give the set of anxiety thresholds that Jack meets or exceeds as an argument of the meaning of *more*. As I will explain in a moment, the Standard Phrase will give rise to a second set of thresholds, those that Jill does not meet or exceed. We have two choices here for how to put the pieces together to arrive at the condition in (8). We could treat *more* as a two-place quantifier, taking as arguments the two sets of thresholds just described:

(10) $[\![more]\!] = \lambda\Theta\,\lambda\Theta'\colon \exists\theta\,(\theta \in \Theta \text{ and } \theta \in \Theta')$

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[2] The binding index on a quantifier corresponds in some sense to a lambda operator on its sister. There is an appendix to this paper where the rules of interpretation are stated.

On that analysis, we should percolate the **d** binding index on *more* in (9), as we did with the **x** binding index on D in (7).

Another possibility is to treat the Standard Phrase as a kind of relative clause, which co-predicates with the AdjP, the way a relative clause co-predicates with the NP it modifies. In this case, *more* is a one-place quantifier:

(11) $[\![more]\!] = \lambda \Theta: \exists \theta \, (\theta \in \Theta)$

Syntactic questions left open in (9) could decide between these choices.[3]

Turning to the Standard Phrase itself, the statement following *than* will be true if **d′** is assigned a threshold that Jill doesn't meet or exceed. *than* is a PREDICATE-QUANTIFIER, it has a binding index and an argument index. The binding index, **d′**, allows it to bind the degree argument of *anxious*. The argument index allows its contribution to the meaning to depend on values assigned to **d**. In effect, I'm treating *than* like a DEGREE PRONOUN; the meaning of a (bound) pronoun depends on values assigned 'outside' and at the same time a pronoun functions as an argument (in the syntactic sense):

(12)   Everyone$_x$ likes$_{<y,x>}$ himself$_{<x>,y}$

So the whole Standard Phrase becomes a predicate assigned TRUE if the assignment to **d** is a threshold that Jill doesn't meet or exceed. And the meaning for *than* is:

(13) $[\![than]\!] = \lambda \theta \, \lambda \Theta' : \theta \in \Theta'$

Here's a relative clause example for comparison:

(14)   Jack$_x$ saw$_{<y,x>}$ some$_y$ (boy$_{<y>}$) (who$_{<y>,z}$ sang$_{<z>}$)

(15) $[\![who]\!] = \lambda u \, \lambda A : u \in A$

What I've laid out here is an existential "Adj-NOT-Adj" analysis for English in which *than* is a degree pronoun. With our central question (2) in mind, we note that on the proposed analysis, there is a need for a quantifier to bind the degree pronoun *than* as well as to saturate the degree-argument of main clause *anxious*. The comparative marker fulfills that need. The word *than* developed from the pronominal time adverbial *then* ("than, conj." OED Online March 2011). So one could imagine a causal chain whereby a pronoun was recruited for use as a standard marker and this entailed the presence of a comparative marker. Our proposal about Hebrew will also rely on the idea that the standard marker was able to retain it's meaning over time even as the comparative construction changed.

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[3] The external syntax of Standard Phrases is notoriously difficult to decide. See Bhatt & Pancheva (2004) and Grosu & Horvath (2006) for 21st century discussion.

3 Hebrew

3.1 The Standard Marker in Hebrew

Below is a Modern Hebrew comparative:

> (16)   Miri <u>yoter</u>   xazaka   <u>mi-Yoni</u>
>   Miri CM   strong [3sg.fem] SM-Yoni
>   'Miri is stronger than Yoni'

The comparative marker is *yoter* and the standard marker is *mi*. Hebrew also has comparatives in which the comparative marker is absent, in other words, bare comparatives:

> (17)   Miri xazaka   mi-Yoni
>   Miri strong[3sg.fem] SM-Yoni
>   'Miri is stronger than Yoni'

Here are three hypotheses about how (17) manages to have a comparative meaning without a comparative marker:

(a) lexical ambiguity: *xazaka* 'strong' has a comparative meaning in (17)

(b) silent MORE: there is a silent comparative marker in (17) in place of the overt *yoter* in (16)

(c) Standard Phrase (*mi-Yoni*) is a degree quantifier. It binds the degree argument of *xazaka* 'strong' and has a semantics that leads to the *more*-comparative (superiority) reading.

The hypothesis in (a) comes from Schwarzschild (2005). Verbs like *prefer* and adjectives like *late* and *early* plausibly are lexical items with a comparative interpretation. The idea here is that adjectives in Hebrew could be ambiguous, with one reading being comparative. The hypothesis in (b) is widespread, adopted for example in discussions of Japanese and Hindi in Beck et al. (2004) and Bhatt & Takahashi (to appear) respectively. Kennedy (2007a) makes a proposal like (c) for Standard Phrases in general. I believe this idea is not uncommon in work on languages with bare comparatives including Chinese and Japanese (cf. Hayashishita (2009), Erlewine (this volume)). Below is a velf that conforms to hypothesis (c). Purely for expository purposes, I assume here and throughout that all comparatives are underlyingly clausal and that phrasal comparatives like (17) are the result of ellipsis[4].

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[4] Besides *mi,* Hebrew has another standard marker, *mea šer*. Hazout (1995) offers syntactic and semantic arguments in support of a clausal analysis of comparative ellipsis constructions with *mea šer*. Bare comparatives are possible with *mea šer*. So, bare comparatives <u>can</u> have clausal Standard Phrases and for the purposes of discussion here, I'm assuming they always do. I'm aware that this is not an innocent assumption (Bhatt and Takahashi (to appear)).

(18)   Hebrew Bare Comparative
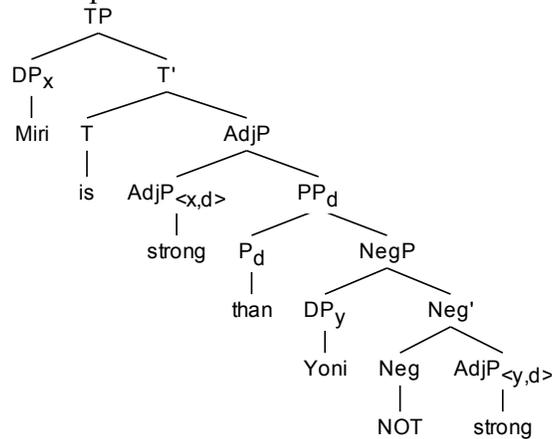
To decide among the alternatives in (a-c) we turn to incomplete comparatives (i.e. comparatives with no Standard Phrase). It turns out that in Hebrew an adjective cannot by itself give rise to a comparative interpretation. This follows directly under hypothesis (c) but not on either of the other two alternatives. Here's some data:

(19)   eize   me-hem   yoter kaše?
            which from-them CM   difficult[3sg.masc]
            'which of them is more difficult?'

(20)   eize   me-hem   kaše?
            which from-them difficult[3sg.masc]
            'which of them is difficult?'

(21)   {We're organizing a play in a senior citizens home. I ask you: Why did you
            choose Esther over Ruth for the lead part? You reply:}

            ki   hi   #(yoter) tsə'ira
            because she   CM   young[3sg.fem]
            'because she's younger'

Without *yoter*, the reply in (21) is odd since it has a positive meaning but Esther is not young.
    Incomplete comparatives are often found with change of state of verbs as in (22) with *yoter*.
If *yoter* is left out, as in (23), the comparative meaning is lost.

(22)   hu   niya[PST.3sg.masc] yoter xazak.
            he   became   CM   strong[3sg.masc]
            'he got stronger'

(23)   hu   niya   xazak
            he   became[PST.3sg.masc] strong[3sg.masc]
            'he became strong'

Another source of evidence in favor of hypothesis (c) comes from the syntax of differentials. Differentials can merge as Specifiers in DegP (Abney 1987). The structure on the right below includes *harbe*, which has a syntax similar to that of *a lot*:

```
        DegP                              DegP
       /    \                            /    \
     DP      Deg'                      DP      Deg'
     |      /    \                     |      /    \
    alot  Deg    AdjP               harbe   Deg    AdjP
          |       |                         |       |
        more    strong                    yoter   xazak
```

According to the hypothesis (c) structure in (18) above, bare comparatives in Hebrew are not DegPs hence Spec,DegP differentials should be ungrammatical, as indeed they are:

> (24)   *harbe   xazak   mi-Yoni
>   a lot   strong   SM-Yoni
>   'a lot stronger than Yoni'

Assuming with Baker (2003) that APs don't have specifiers, this result follows more or less directly on hypothesis (c), but would require additional assumptions on the silent MORE hypothesis.

Assuming hypothesis (c), (24) is ruled out because the differential cannot be merged as a Specifier of a DegP but not because a differential is semantically incompatible with a bare comparative. This means that if there were a different way that differentials could be merged, they might be possible in bare comparatives. Like English, Hebrew allows differentials to be expressed with a prepositional phrase following the comparative adjective. And, as expected, this mode of expression is not dependent on the presence of a comparative marker:

> (25)   hu (yoter) xazak mi-Yoni   bə-harbe
>   he CM   strong SM-Yoni   P – a lot
>   'he's stronger than Yoni by alot'

On the basis of the evidence from incomplete comparatives and from differentials, I adopt hypothesis (c) according to which the Standard Phrase in a bare comparative is a degree quantifier. I will assume that the standard marker itself is a two-place quantifier (type $\langle\langle d,t\rangle, \langle d,t\rangle, t\rangle$). Here's an illustrative velf:

> (26) Miri_x is $\text{strong}_{\langle x,d\rangle}$ [than_d Yoni_y is NOT $\text{strong}_{\langle y,d\rangle}$]$_d$

The **d** index on *than* is percolated here to the entire Standard Phrase. To emphasize the quantificational structure, we can front the Standard Phrase:

> (27)   [than_d (Yoni_y is NOT $\text{strong}_{\langle y,d\rangle}$)]$_d$ (Miri_x is $\text{strong}_{\langle x,d\rangle}$)

Here is the meaning for the standard marker:

> (28) $[\![than]\!] = \lambda\Theta\ \lambda\Theta': \exists\theta\ (\theta \in \Theta$ and $\theta \in \Theta')$

To make things hopefully easier on the reader, (26) was constructed with English words and with the assumption that all Standard Phrases are clausal. (28) is meant as a proposal about the standard marker in Hebrew, so it stands for:

(29) $[[mi]] = \lambda\Theta\ \lambda\Theta': \exists\theta\ (\theta \in \Theta \text{ and } \theta \in \Theta')$

In (27), the meaning of the standard marker combines with two sets of strength thresholds, those that Yoni doesn't meet or exceed and those that Miri does. The existential quantifier in (29) combines with these to give the type of interpretation we are after. I'm assuming the standard marker heads the Standard Phrase and selects for a NegP. I'm guessing that it would also work, perhaps better, to have the standard marker originate inside the Standard Phrase.

　　Summarizing now, Hebrew has bare comparatives as well as comparatives formed with the comparative marker *yoter*. We concluded from the behavior of incomplete comparatives and differentials, that the Standard Phrase in Hebrew is a quantifier that binds the degree argument of the gradable predicate on which the comparative is formed. Strictly speaking, I've only argued that Hebrew Standard Phrases are quantifiers when they are merged in bare comparatives. But I will assume that the meaning of the standard marker provided above is correct no matter where it's used. This assumption will turn out to have interesting consequences when we put Standard Phrases together with the comparative marker *yoter*. In order to fix ideas about *yoter* independently of the Standard Phrase question, we begin by studying incomplete comparatives.

3.2   The Comparative Marker in Hebrew

Here's an indexed variant of our senior home example in (21):

(30) Ester_x yoter_d $\text{tsə'ira}_{<x,d>}$
　　　　　　Esther   CM   young[3sg.fem]
　　　　　　'Esther is younger'

I've put a binding index on *yoter*; without it, the **d**-argument in the adjective would be unbound. The English gloss is itself an incomplete comparative and as such it accurately captures the context dependence of the Hebrew example. Within the context provided in (21), (30) is understood to convey that Esther is younger than Ruth.

　　In (21), the comparison is understood to be with another <u>individual</u> salient in the discourse. But that is hardly representative of incomplete comparatives in general. A glimpse at a wider range of examples betrays a complex pragmatic mechanism deployed to arrive at a 'completion':

(31)   My grass is **greener**, thanks to MiracleGro.

(32)   Work **harder**! (Hoeksema 1983:404)

(33)   The **larger** pot was **hotter** before we applied the paste.

(34)   Whenever the boss looks at an employee, the employee works **harder**.

(35)   He constantly talks about job creation, but to really solve the problem he needs a **more comprehensive** plan.

(36)   Neither the delicious baked goods, nor the fresh coffee nor even the luxurious furniture could draw Celia into Rob's new café. What finally caused her to enter was something invisible but to her mind **far more important**: silence."

This type of situation presents the semanticist with the familiar problem of finding a locus in logical form for discourse information to enter truth conditions, a site where the pragmatic mechanism just alluded to comes into play. This mechanism is broadly similar to discourse based restrictions on quantifier domains. To see some of the parallels consider the following example:

(37)   {Fred returned from his book club meeting all upset. He explained to Mildred that:}

         Someone suggested a book that **every** child reads in 4th grade English classes.

It is natural to understand *someone* in (37) to be restricted to book club members and to understand *every* to be restricted to individuals in Fred and Mildred's local school district. Besides the sort of high-level reasoning that goes into these determinations, this example illustrates a feature noticed by Cooper (1996): domain restrictions are established for each quantifier. In principle there isn't a single domain set for a discourse or even for a sentence (see also Kratzer (2007), Soames (1986), Recanati (1996), see Schwarzschild (1996:74-75) for ramifications of this fact with respect to the distributive/collective ambiguity). Similarly, (33) above lends itself to an interpretation where the first comparative takes another pot as standard while the second takes a different time. Another important feature noted by Cooper is that domains can themselves be "quantified" and we see a similar effect in an incomplete comparative in (34).

Adapting ideas explored in von Fintel (1994) for how to represent discourse domain restriction, we'll assume a velf for (38) in which a quantificational determiner has an argument index whose value is set by applying pragmatic computation to facts of the discourse:

(38)   **Someone**$_{<C1>,y}$ suggested$_{<x,y>}$ a book that **every**$_{<C2>,z}$ child reads in 4th grade English classes.

In keeping with the observations just made, the values for C1 and C2 will be different. So treating the "completion" of incomplete comparatives like a quantifier domain restriction means adding a domain variable to the velf in (30) above, giving us:

(39)   Ester$_x$ yoter$_{<C>,d}$ tsə'ira$_{<x,d>}$
         Esther CM   young[3sg.fem]
         'Esther is younger'

yoter is a degree quantifier and *some* an individual quantifier, but their logical form is similar: both have a domain argument whose value is determined by discourse and both bind arguments.

At this point, we have an analysis for Standard Phrases in Hebrew and for the logical form of the comparative marker. The two come together in (16) above which I repeat here indexed in keeping with our analyses. An English-version follows with the ellipsis undone:

(40)   Miri yoter$_{<C>,d}$ xazaka$_{<x,d>}$ [mi$_d$ Yoni]$_d$
             Miri CM   strong [3sg.fem] SM-Yoni
             'Miri is stronger than Yoni'

(41)   Miri$_x$ is more$_{<C>,d}$ strong$_{<x,d>}$ [than$_d$ Yoni$_y$ is NOT strong$_{<y,d>}$]$_d$

This marriage does not look promising since the comparative marker and the Standard Phrase
<u>compete</u> in (40) to bind the degree argument of the adjective *xazaka* 'strong'. In the next section,
the idea of a quantifier domain adverbial will be introduced. It will allow us to save the marriage
without giving up on the idea that the meanings of comparative markers and standard markers
remain the same whether used separately or together.

3.3 Quantifier Domain Adverbials

Velfs in the previous section contained quantifiers that were indexed with "domain arguments"
as a means for allowing context to limit the domain of the quantification. In addition to
contextual clues, sometimes an adverbial expression is used to signal the domain of a quantifier,
as in the following example:

(42)   [as far as government employees are concerned]$_{<C>}$, most$_{<C>,x}$ men$_{<x>}$ endorse
             the proposal but very few$_{<C>,x}$ women$_{<x>}$ do

The bracketed expression signals that the quantification expressed by *most* and *few* is limited to
government employees. According to the indexation in (42), this process is understood as co-
predication. The adverbial acts as a predicate of C – true or felicitous just in case C is assigned a
set of government employees. It is then this same C that fixes the domains of the quantifiers.
Given its role in (42), I call the bracketed phrase a QUANTIFIER DOMAIN ADVERBIAL.
     The quantifiers in (42) range over individuals but the domains of quantifiers of other types
are also susceptible to adverbial restriction. As is well known, a single modal expression can
often be understood deontically, epistemically, circumstantially and in other ways. Kratzer
(1977) proposed that this variety of interpretations derives from the fact that modals are world
quantifiers and the set of worlds quantified over can be limited in different ways depending on
the context. In her discussion of this essentially pragmatic ambiguity, Kratzer makes use of
adverbials like the bracketed one in (43) below to illustrate particular domain choices (example
(43), unindexed, is Kratzer's). In (43), the presence of *in view of what is known* results in an
epistemic reading of *must*. The indices on the adverbial and the modal represent a proposal about
how that effect comes about. *in view of what is known* is another quantifier domain adverbial and
it requires that C, the domain of *must*, be limited to worlds compatible with what is known,
which is the kind of domain you have in an epistemic reading.

(43)   [In view of what is known]$_{<C>}$, the$_x$ ancestors of the Maoris must$_{<C>,w}$ have
             arrived$_{<x,w>}$ from Tahiti.

If we now return to the puzzle in (41), a solution presents itself:

(41)   Miri$_x$ is more$_{<C>,d}$ strong$_{<x,d>}$ [than$_d$ Yoni$_y$ is NOT strong$_{<y,d>}$]$_d$

Rather than taking the Standard Phrase to be a quantifier trying to bind the **d**-argument of main clause *strong*, we can, without changing the meaning of the standard marker, treat the Standard Phrase as a quantifier domain adverbial co-predicating of the domain of *more* (really *yoter*). The tree below illustrates the idea:

(44)   Standard Phrase as Quantifier Domain Adverbial

```
                        TP
                  ┌──────┴──────┐
                DP_X           T'
                 │        ┌─────┴──────┐
                Miri      T           DegP
                          │       ┌────┴──────────┐
                          is    DegP              PP
                            ┌────┴────┐      ┌─────┴──────┐
                         Deg_<C>,d  AdjP_<x,d>  P_<C>,d   NegP
                            │         │        │     ┌────┴─────┐
                           more     strong    than  DP_y       Neg'
                                                     │     ┌────┴──────┐
                                                    Yoni   Neg      AdjP_<y,d>
                                                            │          │
                                                           NOT       strong
```
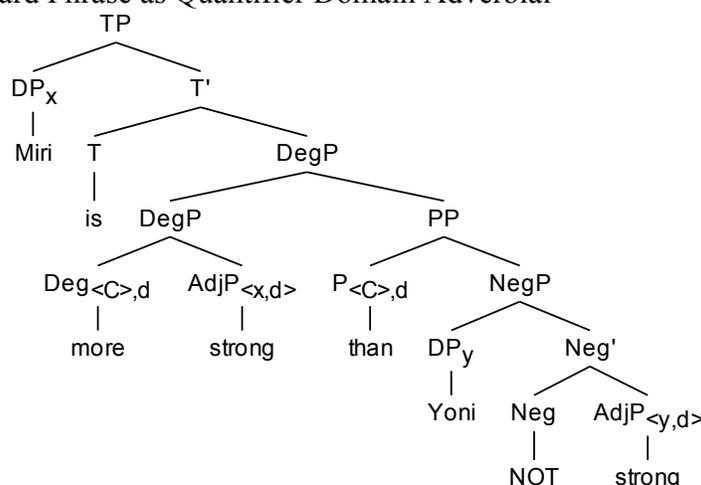
To see how this will work, we start with the meaning for the standard marker introduced earlier in our discussion of bare comparatives:

(28) $[\![than]\!] = \lambda\Theta\,\lambda\Theta' : \exists\theta\,(\theta \in \Theta \text{ and } \theta \in \Theta')$

The **d** binding index on the standard marker in (44) will trigger the creation of the set of thresholds that satisfy the NegP. These will be the set of strength thresholds that Yoni does not meet or exceed. The standard marker in (44) has a predicate type index as well, so that in the end its meaning has to combine with the value for the domain variable C as well as the set of thresholds that Yoni does not meet or exceed. According to (28), the standard marker is an existential quantifier. Putting all this together, the Standard Phrase imposes the requirement that the domain variable be assigned a set of thresholds containing at least one that Yoni doesn't meet or exceed. Given that *more* is indexed with this domain variable, it follows now that the domain of *more* includes a threshold that Yoni does not meet or exceed. Turning now to the lower DegP in (44), the comparative marker is also a predicate quantifier – its meaning is applied to two sets – one being the value for C, the domain of quantification, and the other being the set of thresholds that Miri meets or exceeds. If we assign *more* an existential interpretation, as we did earlier for English, the resulting truth conditions will be too weak, assuming C is assigned a set containing at least 2 thresholds:

(45)   There is a threshold in C that Yoni does not meet or exceed and there is a
              threshold in C that Miri does meet or exceed.

Instead we need to have a universal interpretation:

(46) $[\![more]\!] = \lambda\Theta\,\lambda\Theta'\,\forall\theta\,(\theta \in \Theta \rightarrow \theta \in \Theta')$

This gives us the truth conditions in (47)/(48):

(47)   There is a threshold in C that Yoni does not meet or exceed and Miri meets or exceeds every threshold in C.

(48) $\exists\theta\ (\theta \in C \wedge \neg\text{Strong}(\text{Yoni}, \theta))\ \wedge\ \forall\theta\ (\theta \in C \rightarrow \text{Strong}(\text{Miri}, \theta))$

These truth conditions <u>entail</u> what we had originally:

(49)   There is a threshold that Miri meets or exceeds and that Yoni does not meet or exceed.

At this point, we have considered three types of comparative in Hebrew that differ by the presence or absence of a comparative marker or a standard marker. The analyses proposed are represented in (50)-(52) below:

(50) Miri_x is $\text{strong}_{<x,d>}$ [than_d Yoni_y is NOT $\text{strong}_{<y,d>}$]$_d$

(51) Miri_x is $\text{more}_{<C>,d}$ $\text{strong}_{<x,d>}$

(52) Miri_x is $\text{more}_{<C>,d}$ $\text{strong}_{<x,d>}$ [$\text{than}_{<C>,d}$ Yoni_y is NOT $\text{strong}_{<y,d>}$]

In the bare comparative in (50), the Standard Phrase is an existential threshold quantifier binding the degree argument of main clause "strong". In the incomplete comparative in (51), the degree argument of "strong" is bound by "more". The free C argument allows for an interface with the discourse. Finally, in (52), the Standard Phrase comments on the domain of "more" and then the complex "more strong" entails the existence of a threshold that Miri meets or exceeds that Yoni does not.

   While I have identified a role for context in (51)-(52), I have provided only the barest hints about the pragmatic rules that will complete the analysis. (31)-(36) above are offered as evidence that such rules exist and (52) puts a boundary condition on them. It's clear that beyond the standard richness that quantifier domain selection displays, degree quantifiers will have their own peculiar pragmatic features that flow from the ordering properties of the universe from which the domain is selected.

4   Summary and Discussion

We began with the question of how comparative markers and standard markers relate and here is how things turned out. In English, the standard marker is a pronoun. The comparative marker fills the need for a binder of that pronoun and it also binds the degree argument of the compared adjective. In the analysis offered for Hebrew, the standard marker is a quantifier. It binds the degree argument in a compared adjective. A comparative marker is not needed and the Standard Phrase is, in effect, an argument of the adjective in the syntactic sense. In an incomplete comparative there is no Standard Phrase so a comparative marker is needed. Finally, quantifier domain adverbialization is a compositional option that allows a quantificational comparative

marker and a quantificational standard marker to co-occur in which case the Standard Phrase is 'demoted' to adjunct status. In effect then, our small study contrasts a standard marker that requires a comparative marker with a standard marker that makes the comparative marker unnecessary but does not exclude it.

As just mentioned, on the proposed analysis, Standard Phrases in Hebrew can function both as arguments and as adjuncts. Bogal-Allbritten (2008,2010, this volume) provides evidence for a similar duality in Navajo. Standard Phrases in Navajo can appear with and without the adverbial marker `go. And when they appear with –go their external syntax reflects adjunct status. Navajo does not have a comparative marker, which means that if a quantifier domain adverbial analysis is correct, a non-overt quantifier would be implicated. The form the adjective takes when combined with a –go marked Standard Phrase implicates a positive operator (Cresswell 1977, see also Kennedy 2007b on 'implicit comparison'). And, as Bogal-Allbritten has documented, when –go is present, there is a greater-than-standard entailment in the comparative of the kind that is normally associated with the positive.

On the proposed analysis of Hebrew, whereas full comparatives have adverbial Standard Phrases, in bare comparatives the Standard Phrase is an argument of the adjective. It is a mainstay of lexical semantics that the number of syntactic arguments a predicate has is usually fewer than the number it could potentially have given its meaning. A predicate that describes an event, for example, usually has arguments corresponding to only some of the event participants. This general picture of argument expression leads to the expectation that not all adjectives will necessarily take Standard Phrase-arguments, even if a degree argument is semantically coherent for any gradable predicate. This is exactly what you find in Hebrew. A bare comparative can be formed with the adjective *xazak* 'strong' and with quite a few others, but *atsbani* 'anxious' and many other adjectives do not allow for the formation of bare comparatives (Schwarzschild 2005, Glinert 1989)[5]. Bhatt &Takahashi (to appear) likewise report that bare comparatives are a lexically limited option in Hindi. The same is true in Navajo. By contrast, our first example of a bare comparative in (3) above was taken from Japanese, and as far as I can tell, there is no limitation in that language on the formation of bare comparatives. This suggests to me that whatever the strategy is for forming bare comparatives in Japanese, it is different from Hebrew, Hindi and Navajo.

In the development of this paper, quantifier domain adverbialization was introduced as a method for "modifying" the use of an argument expression so that it would function as an adjunct. Quantifier domain adverbialization may have played a similar role in the development of the Hebrew language. In earlier stages of Hebrew, there was no comparative marker. The language had only bare comparatives. The present day comparative marker, *yoter*, was originally an intensifier with the meaning of *a lot, extremely* or *very* (Schoors 2004:216). Somehow or other, the intensifier would have been reinterpreted as a functional head binding the degree argument and this would have required a reinterpretation of the Standard Phrase, thus making quantifier domain adverbialization a facilitator of change.[6]

The focus here has been on comparative markers and Standard Phrases, but a less parochial outlook takes aim at the trade-off between any functional head/inflectional marker and a semantically related phrase. This includes tense markers and temporal adverbials, mood markers, modals and modal adverbs and possibly negation and negative adverbs. The tension between the comparative marker and the Standard Phrase in (41) which drove us to posit quantifier domain

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[5] This is another reason to reject the silent MORE analysis for Hebrew bare comparatives in section 3.1 above.
[6] Sawada (to appear) discusses the recent development in Japanese of a comparative marker.

adverbialization comes up in these cases as well (*Jack will leave tomorrow*; *He might possibly be upset*). So quantifier domain adverbialization may have a larger role to play synchronically and diachronically.[7] Much of the typological literature (cf. Andersen 1983) and the recent semantic literature (cf. Kennedy 2007a, Matushansky 2011) tries to decide where the comparative meaning is concentrated: the comparative marker or the standard marker. In this paper, I've suggested that it is potentially carried in both markers. This seems to be a position that is held in some of the literature on tense and time adverbials. I'm less familiar with recent work on negation and on modality. The possibility of "double encoding" via quantifier domain adverbialization seems especially relevant for languages that are transiting from a phrasal locus of meaning to a functional/inflectional one.

Appendix: Variable Enriched LFs

The structure below is a variable enriched logical form, or velf.

(53)
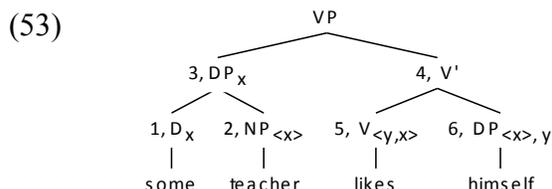
The index on D is a binding index. The verb is indexed with a grid consisting of two argument indices. Interpretation proceeds relative to an assignment function *g* using the following rules:

(54)   PREDICATE RULE   Let ψ be a non-branching structure consisting of α dominating β.

The meaning of ψ is the result of applying the meaning of β to the values assigned by *g* to argument indices on α, if any, in the order in which they appear on α.

(55)   QUANTIFIER RULE   Let ψ be a binary branching structure with one daughter, α, with binding index j and another daughter φ.

The meaning of ψ is the result of applying the meaning of α to the set of all values of j that make φ true.

(56)   CO-PREDICATION   Let ψ be a binary branching structure with two daughters. ψ is assigned TRUE if both daughters are, it is undefined if one of the daughters is and otherwise it's assigned false.

When the rule in (54) is applied to the structures numbered 1, 2 and 6 in **Error! Reference**

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[7] If one thinks of the free R variable introduced in Bach-Cooper(1978)'s analysis of Hittite relative clauses as a domain variable, then their relative clauses are quantifier domain adverbials. And Larson(1982)'s extension of that analysis to temporal relatives in Warlpiri are temporal quantifier domain adverbials.

(57) $[\![1]\!]^g = [\![some]\!]^g$ $[\![2]\!]^g = [\![teacher]\!]^g (g(x))$ $[\![6]\!]^g = [\![himself]\!]^g (g(x))$

When the rule in (55) is applied to the structures numbered 3 and 4 in **Error! Reference source not found.** we get:

(58) $[\![3]\!]^g = [\![1]\!]^g (\{u: [\![2]\!]^{g[x\to u]} = \text{TRUE}\})$
(59) $[\![4]\!]^g = [\![6]\!]^g (\{v: [\![5]\!]^{g[y\to v]} = \text{TRUE}\})$

The reader may wish to check that the rules provided yield the expected interpretation for the tree in **Error! Reference source not found.**, when *some, teacher* and *likes* have the meanings normally assigned them while *himself* is assigned a function that applies to an object *u* and then to a set to give TRUE if the object is in the set (in fact this is the meaning assigned to *who* in (15) above).

Acknowledgements

As I discovered while writing this paper, there is a great deal of very interesting work published in recent years that relate to the central issues in this paper. Unfortunately, I did not have the time to study it carefully. I look forward to doing that soon and I apologize to those whose work I've overlooked here (I managed to included some of the papers in the references).

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