

Comparison Constructions: English vs. Guaraní

Universität Tübingen
Lehrstuhl für theoretische Linguistik
Prof. Dr. Sigrid Beck

Wissenschaftliche Arbeit
eingereicht von

Daniel Fleischer
Am Brönnen 15
72074 Tübingen

Special thanks to Sveta Krasikova for her great support.

0. Introduction

For all those who ever in their life have learnt a foreign language sooner or later it becomes obvious that languages differ in certain grammatical constructions and parameters.

The goal of this work is a reliable analysis of the differences between comparison constructions in English and Guaraní by providing a theoretically plausible syntax/semantics interface. The given data of Guaraní include as well other comparison constructions like the equative, the superlative and the subcomparative, which of course won't be excluded of the analysis.

In a first step of this comparison von Stechow's analysis (1984) will be introduced. Within this a general overview on comparison constructions in English and their semantics will be given (chapter one). The chapter mainly refers to Beck's draft "HSK Semantics. Comparatives and Superlatives." (April 2007). Chapter two gives attention to the Guaraní language: on the one hand it will be roughly described, on the other hand involved data will be introduced. Here we will deal with the most striking data of Guaraní comparison constructions and some first observations.

In chapter three follows the analysis. It will include some data of comparison constructions in Russian mainly to illustrate similarities between their analysis (Krasikova 2007) and mine.

A last, short chapter will compactly summarize the results of this work and try to give an outlook.

In the appendix a description of the empirical work will be made.

1.0 English and the Standard Theory (von Stechow, 1984)

In this chapter the standard degree semantics and the compositional analysis of comparison constructions according to von Stechow are introduced. It starts with degree semantics and goes on with the semantics of comparatives in English.

1.1 The comparative – basic idea

Let us start with the basic idea of comparatives .

There exist different forms of comparatives in English The apparently simplest forms seem to be sentences like

- (1) a. Mary is taller than Peter.
b. Mary is taller than 1.60 m.

Comparatives like (1) a. obviously express a relation between two individuals:

[| taller|] = $\lambda x. \lambda y. y$'s height > x 's height

1 (b) however suggests that two degrees of height, rather than individuals, are compared with each other. This finds some strong evidence in sentences like

- (3) Maria is taller than the sofa is long.

where “Maria’s height exceeds the length of the sofa”.

Beck reports and argues in her draft that “it seems natural therefore to suppose that the comparative is a relation between two degrees – the “>” relation. It acts separately semantically from the adjective it combines with” (page 2). Constructions like (3), called subcomparatives (comparative subdeletion), “show us furthermore that both the main clause and the than-clause must make available those degrees:

[|-er |] = the (maximal) degree matrix clause > the (maximal) degree than-clause “ (ibid.).

1.2 The adjective

Having stated so far that using adjectives in comparison constructions we rather consider a relation of their degrees than a relation between individuals, we can say that adjectives generally relate individuals with sets of degrees, for example the degree of tallness that they reach.

[| tall |] = $\lambda d: d \in D_d . \lambda x: x \in D_e . \text{Height}(x) \geq d$

Following this argumentation, Beck writes that “the degree arguments must be restricted to particular sorts” (e.g. [| tall |] is restricted to spatial distances measured in the vertical dimension). We frequently simplify as follows:

[| tall |] = $\lambda d. \lambda x. x \text{ is } d\text{-tall}$

Now let’s have a closer look at measure phrases like

- (4) a. Maria is 1.70 meter tall.
b. [| tall |] (1.70 meter) (Maria) = 1 iff Height (Maria) \geq 1.70 meter

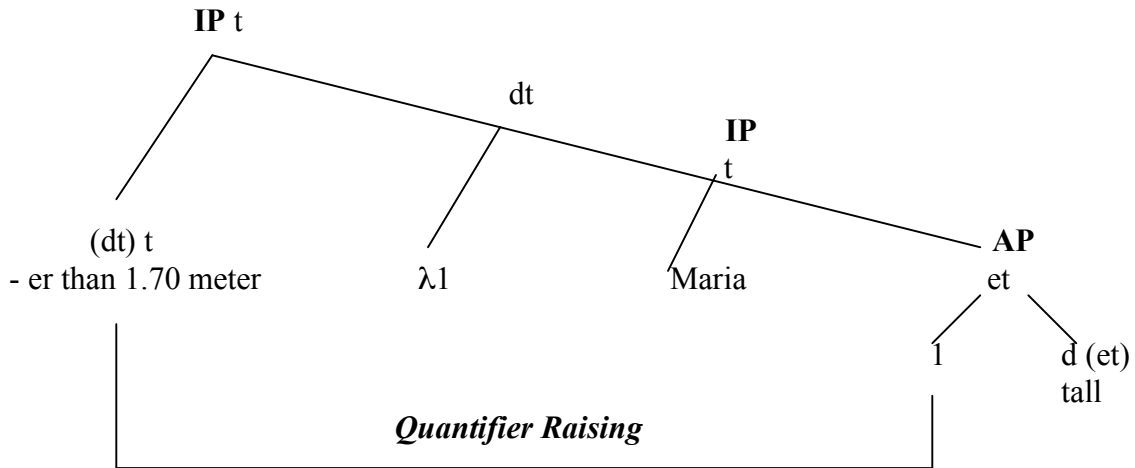
But why do we assume that Maria’s height, although we say that she is 1.70 meter tall, equals or is larger than this degree?

- (5) Maria is 1.70 meter tall. In fact she is even 1.73 meter.

In (4) a. the measure phrase occupies the degree argument slot of the adjective. The meaning of the sentence is true if the individual reaches the degree measured, and she can exceed that degree without contradiction (see (4) b.)

Given this understanding of the adjective meaning, a complete derivation of the adjective meaning of example (6) is as shown below

(6) Maria is taller than 1.70 meter.



Heim (2001) points out that since the DegP is of type (dt)t and a quantifier over degrees, it is an excellent candidate to undergo Quantifier Raising.

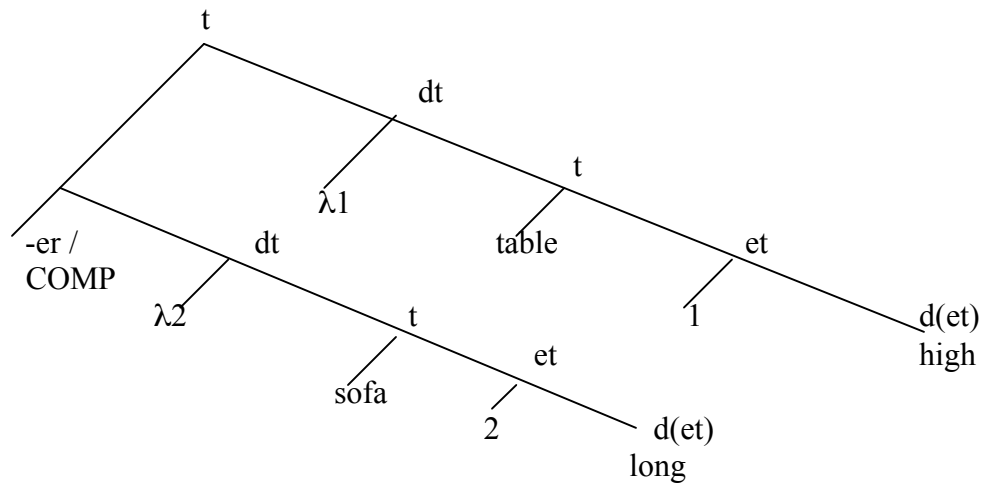
Let's consider the subcomparative again and modify (3):

(7) The table is higher than the sofa is long.

The sentence has the following truth value:

$$\max (\lambda d. \text{the table is } d\text{-high}) > \max (\lambda d. \text{the sofa is } d\text{-long})$$

See structure below:



Again the degree argument is of type $dt(t)$ (and a quantifier over degrees as Heim (2001) argues) and therefore an excellent candidate to undergo quantifier raising to repair the type mismatch.

The embedded clause denotes a set of degrees. It is derived by abstracting over the degree argument of the degree predicate. The COMP- operator $[[-er]]$ takes two sets of degrees as its arguments (denoted by the embedded clause and the matrix clause, respectively) and maps them to 1 iff the maximal degree from the second one is greater than the maximal degree from the first one. Below we can see how this works in practise.

According to Heim & Kratzer (1998) I suggest the following compositional interpretation of (7):

$$\begin{aligned}
 & [[[-er] [2 \text{ the sofa is 2-long}]] [1 \text{ the table is 1-high}]]^s \\
 & = 1 \text{ iff} \\
 & [[[-er] [2 \text{ the sofa is 2-long}]]]^s ([1 \text{ the table is 1-high}]^s) \\
 & = 1 \text{ iff} \\
 & [-er] ([2 \text{ the sofa is 2-long}]^s) ([1 \text{ the table is 1-high}]^s) \\
 & = 1 \text{ iff } \textit{Lexical Entry } [[-er]]: [\lambda D. \lambda D'. \max(D') > \max(D)] \\
 & [\lambda D. \lambda D'. \max(D') > \max(D)] ([2 \text{ the sofa is 2-long}]^s) ([1 \text{ the table is 1-high}]^s)
 \end{aligned}$$

= 1 iff **Simplification**

$\max ([[1 \text{ the table is } 1\text{-high}]]^s) > \max ([[2 \text{ the sofa is } 2\text{-long}]]^s)$

= 1 iff

$\max (\lambda d. ([[\text{the table is } 1\text{-high}]]^{g[1/d],s})) > \max (\lambda d. ([[\text{the sofa is } 2\text{-long}]]^{g[1/d],s}))$

= 1 iff **by Functional Application**

$\max (\lambda d. [[[1\text{-high}]]^{g[1/d],s} (\text{the table})]]) > \max (\lambda d. [[[2\text{-long}]]^{g[1/d],s} (\text{the sofa})]])$

= 1 iff **by Functional Application**

$\max (\lambda d. [[[\text{high}]]^{g,s} ([[1]]^{g[1/d],s}) (\text{the table})]]) > \max (\lambda d. [[[\text{long}]]^{g,s} ([[2]]^{g[1/d],s}) (\text{the sofa})]])$

= 1 iff **Lexical Entry [/ high /]: $\lambda d. \lambda x. \text{Height}(x) \geq d = x$ is d -high in s**

$\max (\lambda d. [[\lambda d. \lambda x. x \text{ is } d\text{-high in } s] ([[1]]^{g[1/d],s}) (\text{the table})]]) > \max (\lambda d [[(\lambda d. \lambda x. x \text{ is } d\text{-long in } s] ([[2]]^{g[1/d],s}) (\text{the sofa})]])$

= 1 iff

$\max (\lambda d. [\text{the table is } [[1]]^{g[1/d],s} \text{-high in } s]) > \max (\lambda d [\text{the sofa is } [[2]]^{g[1/d],s} \text{-long in } s])$

= 1 iff **by Predicate Abstraction where $([[1]]^{g[1/d]} = g [1/d] (1) = d$**

$\max (\lambda d. \text{the table is } d\text{-high in } s) > \max (\lambda d. \text{the sofa is } d\text{-long in } s)$

Having illustrated this example and having derived its compositional interpretation, we can quickly summarize the most important aspects of the theory of comparatives introduced in this section:

1. comparison is between degrees
2. matrix and than-clause provide sets of degrees through abstraction over a degree variable
3. the comparative morpheme relates their maxima
4. adjectives denote relations between degrees and individuals

1.3 The positive (von Stechow, 2006)

A frequent use of adjectives is its positive form like in (8).

(8) Maria is tall.

It doesn't seem to occur in an explicit comparison. We say that they operate on a scale that has a neutral domain. The positive can be defined (von Stechow, 2006) as a “universal quantifier stating that the degree predicate is true” (Beck, 2007, page 15) of every d' in g as below.

$[\text{Maria is tall}]^g = 1$ iff
 $\forall d' \in g(N(I)): \text{Height}(\text{Maria}) \geq d'$

Adopting this for antonyms we get:

$[\text{Maria is small}]^g = 1$ iff
 $\forall d' \in g(N(I)): \text{Height}(\text{Maria}) < d'$

Von Stechow concludes that the “new positive operator provides a unified semantics for the positive, i.e. it combines with both pairs of a polar opposition, and is compatible with the negation theory of antonymy. The interpretation of the positive is context dependent. In contrast to earlier analyses of the positive ((Lewis, 1972), (Kamp, 1975), (Klein, 1980)), this semantics is designed to combine with standard comparative semantics.” (Beck 2007, page 16).

The POS-operator is restricted by a variable (N) that gets its value from the context (by the assignment function). The value of N is assumed to be the neutral domain on the relevant scale and I is assumed to be the interval containing all degrees within the neutral domain. POS is a universal quantifier over degrees (as COMP, see above). It states that

all degrees from the neutral domain are contained in its argument – the set of degrees denoted by the clause:

$$[[\text{POS}_{N,I}]]^g = \lambda D. \forall d \in g(N(I)): \text{Height} : D(d) = 1$$

1.4 Measure phrases

(9) The shelf is 1.50 long.

Measure phrases are constructions where a measure phrase is added to the unmarked form of an adjective as in (8). In English many adjectives do not allow measure phrases:

(10) *The car 1,800 pounds expensive.

(11) *The cow is 465 kilograms heavy.

(12) *Yesterday it was minus 5 degrees cold.

As the positive does, we assume that the measure phrases “saturate ... an argument slot of adjectives.” (Beck, 2007).

An important question that arises here of course is why measure additions to adjectives aren't possible more systematically in English. A question that will remain unanswered in this work, but chapter 3 will pick up this phenomenon again for the Guaraní language.

At the same time we will find access to the answer why languages vary so much with respect to the possibility of measure phrases.

Von Stechow suggests again that one could “QR them, ..., to make them combine with the rest of the clause” (Beck, 2007) since measure phrases are of type $(dt)t$ and the adjective of type $d(et)$.

That might give us an answer to the question why measure phrases are generally possible in English, but again: it doesn't explain why only with some adjectives.

1.5 Degree questions

The than- clause and the wh-clause with a degree gap are the important features of the standard theory. By predicate abstraction (see above) remains a degree gap as a trace of wh-movement operator (which is a degree argument like in measure phrases the given degree or like the POS operator) .

An argument for predicate abstraction over degree variables can be drawn from degree questions (Beck, 2007):

- (13)
- a. How high is the desk?
 - b. [Q [wh1 [the desk is t1 high]]]
 - c. [[Q]] (λd .the desk is d-high)
 - d. for which d: the desk is d-high

1.6 Equatives and Superlatives

Von Stechow furtheron argues that equatives are quite similar to comparatives, only the relation expressed is a bit different. The semantics derived from equatives corresponds to “at least as adjective as”:

- (14)
- a. Maria is as tall as Pedro is.
 - b. Maria is as nice as Pedro is, if not nicer.

(15) $[[\text{as}]] = \lambda D1. \lambda D2. \max(D2) \geq \max(D1)$

(16) $[[\text{as} [1[\text{Pedro is } t1 \text{ tall}]]] [1[\text{Maria is } t1 \text{ tall}]]]$

'The degree of height reached by Maria is at least as big as the one reached by Pedro.'

There is also an intuitively close relation between comparatives and superlatives.

- (17) a. Maria is the tallest.
b. Maria is taller than anyone else.

Beck writes that “the superlative differs from the comparative in its surface appearance - it does not necessarily come with an indication of the intended item of comparison. Heim (1985, 2001) spells out the following semantics:

$$[[\text{-est}]] = \lambda R \langle d, et \rangle . \lambda x . \max(\lambda d . R(d)(x)) > \max(\lambda d . \exists y \neq x [R(d)(y)])”$$

2.0 Comparison Constructions in Guaraní

2.1 The Guaraní language

2.1.1 Some very general facts

Guaraní is spoken in Paraguay, northeast Argentina, parts of Bolivia and in southwest Brazil by about six million people. Typologically Guaraní is a language of the Tupi-Guaraní language family.

Today Guaraní is – in addition to Spanish - an official language in Paraguay. Over the past years there have been attempts to standardize Guaraní in Paraguay. It has become an obligatory school subject. Besides the standardized form other dialects such as Mbya-Guaraní, Aché or Chiriguano exist.

According to a census in 1992 1.6 million people in Paraguay spoke Guaraní as their mother tongue and another 2.0 million a mixture of Spanish and Guaraní, the so-called Jopara.

All accessible data of this work were collected in Asunción, Paraguay with the help of native Guaraní speakers.

2.1.2 Some observations on Guaraní grammar

It might be interesting – considering the data following in the next bullets – to introduce some phenomena of the Guaraní grammar. This very small selection simply wants to function as a guide to understand them and to avoid possible confusions.

Guaraní doesn't inflect at all. The meaning of the only existing form of e.g a noun arises from the context, e.g. by a preceding numeral.

- (18) Pedro ohasahina 45 ro'y.
Pedro carry-prog 45 summer
Pedro is 45 years old.

where *ro'y* represents both the singular and the plural form.

Adjectives or attributives are not inflected either. Cliticizations are very common which creates a language rich in allomorphs.

Guaraní speakers tend to use a present tense form, although a past tense form (or rather a past morpheme added to the inflected present tense verb form) should have been expected. Guaraní is a very context dependent language.

2.2 Database of comparison constructions in Guaraní

2.2.1 Short introduction to main morphemes of comparatives in Guaraní

First it might be helpful to introduce the most important morphemes of comparison constructions in Guaraní. Below a list of them with explications is given.

<u>Guaraní:</u>	<u>English:</u>	<u>Function/Occurrence:</u>
i-	is	3 rd person singular present tense copula prefix (mainly prefixed to adjectives/attributes in the examples)
i-	has	3 rd person possessive morpheme, as well prefixed (mainly prefixed to nouns in the examples)
- gui	than	the than-morpheme with the same function as its English pendant, always sentence-final, suffixed to all categories of words
-ve	-er / more	comparative morpheme, same distribution as English –er morpheme: suffixed to adjective
-veva¹	-est/most (?)	presumed superlative morpheme, same distribution as -est morpheme in English: suffixed to adjective
-te²	exactly	presumed equative morpheme in equative constructions with gradable adjectives, suffixed to adjective
-haicha/icha	as...as	functions as its English pendant, always sentence final; occurs in equative constructions with gradable adjectives and other similar constructions

2.2.2 Degree constructions

A first important step to integrate a future discussion and analysis into von Stechow's standard theory is the question whether we can assume that adjectives in Guaraní have degree phrase arguments or not.

¹ The function of the –va morpheme is not yet clarified. There are at least two different assumptions:

1. it is a superlative morpheme as the English –est
2. it is a relative pronoun and introduces a relative clause where the matrix clause is compared with the relative clause (a “hidden” comparative)

² Since the data on the equative are not yet explicit and profound enough, we only can assume that –te is an obligatory prefix for these constructions

(19) Pe arahaku haku- ve 5 grado che aimo'a- vaekuri
 this temperature warm- more 5 grades I think past-m
 gui
 than

The temperature is 5 C° warmer than I thought.

(19) indicates that Guaraní seems to have a proper degree semantics for main clause and subordinate clause.

Then of course we should be able to prove whether in Guaraní comparison constructions we also compare sets of degrees rather than individuals.

(20) Maria i- jyvate- ve 1,70 metro- gui.
 Maria poss-morph tall- more 1,70 metre- than
 Maria is taller than 1,70.

(20) is adequate to the English construction. We can as well assume for Guaraní that rather degrees than individuals are compared to each other.

2.2.2.1 The comparative in Guaraní

Let us consider some simple examples of comparatives in Guaraní.

(21) Maria i - jyvate- ve Pedro- gui.
 Maria kop- tall- more Pedro- than
 Maria is taller than Pedro.

(22) Maria i- guaigui- ve Pedro-gui
 Maria kop old/fem more Pedro-than
 Maria is older than Pedro

- (23) Juan onani pya'e -ve Diego- gui.
 Juan ran fast -more Diego-than
 Juan ran faster than Diego.

The question arising here is of course whether comparatives in Guaraní express the same as they do in English: a simple comparison of two (maximal) degrees without any restrictions. Interviewees confirmed that they do: In all constructions above we simply compare the maximal degrees on the relevant scales of the individuals.

We can also state for the –ve morpheme:

[| -ve |]: [$\lambda D.\lambda D'. \max (D') > \max (D)$]

2.2.2.2 The positive in Guaraní

- (24) Maria i- jyvate.
 Maria kop tall
 Maria is tall.

- (25) Pedro i- karape
 Pedro kop small
 Pedro is small

These positive constructions in Guaraní have the same semantics as English positive constructions do have:

[| Maria ijyvate |]^g=1 iff
 $\forall d' \in g(N): \text{Height (Maria)} \geq d'$

Adopting this as well for the antonym we get:

$[[\text{Maria ikarape}]]^g = 1$ iff

$\forall d' \in g(N): \text{Height}(\text{Maria}) < d'$

2.2.2.3 Degree questions & measure phrases

So far we can state that in both languages, in English and in Guaraní seem to occur the same phenomena concerning the comparative and the positive.

In this section we will see that degree questions and measure phrases are not acceptable at all in Guaraní and that speakers use other constructions to express them.

(26) *Mba'eita i-tuja Pedro
How kop-old Pedro
How old is Pedro?

(26) is unacceptable. Instead Guaraní uses constructions we know from the Romanic languages (French or Spanish, respectively):

(27) Mboy ary piko oguereko Pedro?
How many years question has Pedro
How old is Pedro?

Very similar to this example are degree phrases constructed, where examples like (28) are out as well and other constructions like (29) and (30) are acceptable:

(28) *Pedro i- tuja 45 ary.
Pedro is- old 45 year
Pedro is 45 years old.

A combination of gradable adjective and degree argument is not acceptable in both cases (degree questions & measure phrases). Again, Guaraní speakers prefer other constructions to express measure phrases as below:

(29) ?Pedro oguereko 45 ary.
Pedro has 45 year
Pedro is 45 years old.

(30) Pedro ohasahina 45 ro'y.
Pedro carry-prog 45 summer
Pedro is 45 years old.

Except (30), the degree question and the measure phrase in this case correspond exactly to constructions in French or in Spanish:

(31) Pedro tiene 45 anos.
Pedro has 45 years
Pedro is 45 years old.

But:

(32) *Pedro es 45 anos viejo.
Pedro is 45 years old
Pedro is 45 years old.

We observe the same in French:

(33) Pedro a 45 ans.
Pedro has 45 years
Pedro is 45 years old.

- (34) *Pedro est 45 ans vieux.
 Pedro is 45 years old
 Pedro is 45 years old.

Degree questions in French and Spanish according to (26) are unacceptable as well:

Spanish: *Qué / *Cómo / ??Cuán viejo es Pedro?

French: *Que / *Comme / *Comment vieux est Pedro?

Constructions according to (27) are preferred.

In other measure phrase constructions occur similar phenomena:

- (35) *Pe juguata kuri potei ara ipuku
 this journey past six days long
 This journey was six days long.

Instead of (35), Guaraní speakers use

- (36) Pe juguata hia're- kuri potei ara
 this walk take- past-m six day
 This journey took six days.

We have to assume that instead of degree questions and measure phrases that combine degree arguments with gradable adjectives, Guaraní prefers other constructions that avoid these combinations.

2.2.2.4 The subcomparative

In section 1.1 I introduced the subcomparative. We said that the COMP operator takes two sets of degrees as its argument and states that the maximal degree on the relevant

scale of the matrix clause is greater than the maximal degree on the relevant scale of the embedded clause.

We know that the positive and simple comparative constructions in Guaraní function similarly to their English analogies. Does the subcomparative as well?

- (37) *Pe mesa i- jyvate- ve pe oke i- pe- gui
this table kop high- more this door kop wide- than
This table is higher than this door is wide.

Subcomparative constructions like (37) are not acceptable in Guaraní. Even a form like (38) seems to appear strange to native speakers:

- (38) Pe mesa i- jyvate- ve pe oke i- pekue- gui.
This table poss high- more this door poss width than
This table is higher than the width of the door.

2.2.2.5 Equatives and superlatives

Unfortunately, as already stated above, the data collected about equatives and superlatives in Guaraní are not yet investigated profoundly and explicitly enough to make one hundred percent reliable statements about them.

For the present we have to deal with the given data and try to integrate them into a following analysis:

- (39) Maria I jyvate- te Pedro- icha.
Maria kop tall exact Pedro- as
Maria is as tall as Pedro.

- (40) Maria I jyvate Pedro- icha.
Maria kop tall Pedro- as
Maria is as tall as Pedro.

Since a construction like (40) haven't been proved at all, we have to assume that Guaraní speakers need the –te morpheme to express the equative. What we do not know is if this expresses a relation introduced in 1.5 where we talked about a “at least as + adjective” relation:

$$[[as]] = \lambda D1. \lambda D2. \max(D2) \geq \max(D1)$$

The –te morpheme combined with –(h)aicha could also suggest a “equals exactly” relation:

$$[-te + (h)aicha] = \lambda D1. \lambda D2. \max(D2) = \max(D1)$$

Using other gradable adjectives, again Guaraní speakers seem to avoid constructions similar to (40):

(41) Maria ha- Hua ojo- avegua
 Maria and Juan same age
 Maria and Juan have the same age.

(42) ??Maria i- tuja- te Pedro- icha.
 Maria kop old exact Pedro- as
 Maria is as old as Pedro.

(42) is not proved, but to express this relation, (41) is the more prominent version.

The same data problem occurs with superlatives in Guaraní:

(43) Maria ojogua petei aranduka hepy- veva umi aranduka
 Maria bought a book expensive most those book
 apyte- gui avave nd- ojogua- i- va.
 among- than nobody not bought neg pro
 Maria bought the most expensive book among those books that nobody bought.

- (44) Maria amboguata pya'e- ve- kuri mbayrugata
 Maria drive fast- more past car
 Maria drove the fastest car / a faster car??

What do we learn from these data?

As mentioned above, we cannot be sure that the –va morpheme doesn't function as a relative pronoun introducing a relative clause. Then of course this would be a comparative with a “hidden” superlative meaning. This could as well be assumed for (44), where native speakers avoid a superlative form and simply use a comparative that explains well enough a given scenario. We could assume that a “real” superlative in the context of these constructions is not necessary to create for Guaraní speakers.

3.0 Analysis

3.1 The starting position

I have introduced the Standard Theory and we have considered some main examples of comparative constructions in Guaraní. Intuitively we might have got an idea of the differences that occur between English and Guaraní comparatives. This is the starting point to go deeper into things and to propose an analysis under the conditions and with the targets that I gave in the introduction.

Empirical data have shown that both, measure phrases and degree questions are as unacceptable in Guaraní as subcomparatives.

At the same time, clausal comparatives occurred as acceptable (see 3.1.1), which allows an analysis according to von Stechow (1984).

The following table gives an overview of degree constructions in both languages.

	Degree questions	Measure phrases	Comparatives: Positive-marked?	Positive	Equative	Sub-comparative	Superlatives
English	yes	yes	no	yes	no	yes	yes
Guaraní	no	no	no	yes	(?)	no	yes (?)

Again: The analysis is an attempt to give a clause structure of comparison constructions in Guaraní and its semantic interpretation, implemented in the syntax-semantics interface.

Various problems arise here, especially regarding

- the absence of subcomparatives, degree questions and measure phrase constructions in Guaraní;
- the questions whether there is a relation between these phenomena or not, and
- how to analyse them i.e. to give syntactically/semantically motivated reasons.

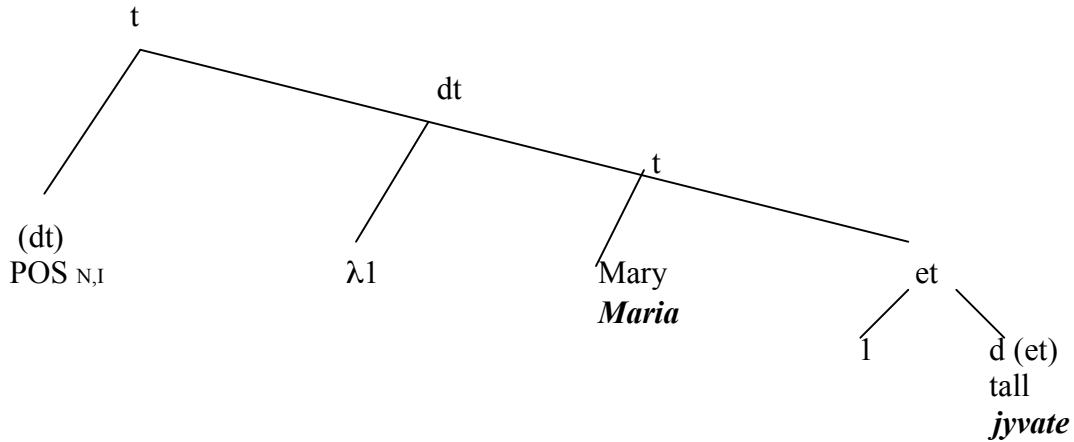
Furthermore the equative and the superlative have to be considered (with care) in order to integrate them into an adequate analysis and/or to strengthen the analytical steps done before.

Since required data in these two cases (equative and superlative) are not yet profound and explicit enough, this of course will leave some space for hypothetical proposals.

3.2 The POS-operator

As Standard, Guaraní knows the positive. According to von Stechow (2006), the following Logical Form is proposed for English, and according to the meaning of the sentence in Guaraní below, the LF can be proposed for Guaraní as well.

- (45) Maria i- jyvate.
Maria kop tall
Maria is tall



We assume that the semantics of this positive adjective construction obtains in both languages, English and Guaraní: there is a presumed interval in the neutral domain on the scale of height. Mary's height is at least to find at the maximum of this interval or even above it.

This relation is expressed by the POS-operator (von Stechow, 2006):

$$[[\text{POS}_{N,I}]]^g = \lambda D. \forall d' \in g(N(I)): D(d')$$

$$[[\text{Maria ijyvate}]]^g = 1 \text{ iff}$$

$$\forall d' \in g(N(I)): \text{Height}(\text{Mary}) \geq d'$$

We assume that Guaraní makes use of the same kind of POS-operator as English.

It is important to keep this semantics of the POS-operator in mind. It might help us later to understand the unacceptability of measure phrases, degree questions and subcomparatives in the Guaraní language. But first let us see how comparatives in general are formed and how a proposal for their analysis might look like.

3.3 The COMP-operator

A preliminary step to analyse comparatives in Guaraní is the one that gives us answer to the question whether Guaraní allows clausal comparatives or only phrasal ones. Heim

(1985, “Notes on Comparatives and Related Matters”) suggested an analysis for phrasal comparatives, which considers individuals in comparison to each other. Von Stechow (1984) proposed an analysis for clausal comparatives.

Few data have shown that clausal comparatives are acceptable in Guaraní. Thus we have to assume their acceptability in general.

- (46) Maria i- jyvate- ve che aimo’a- va’ekue-
 Maria poss-morph tall- more I think past-morph-
 gui.
 than
 Maria is taller than I thought.

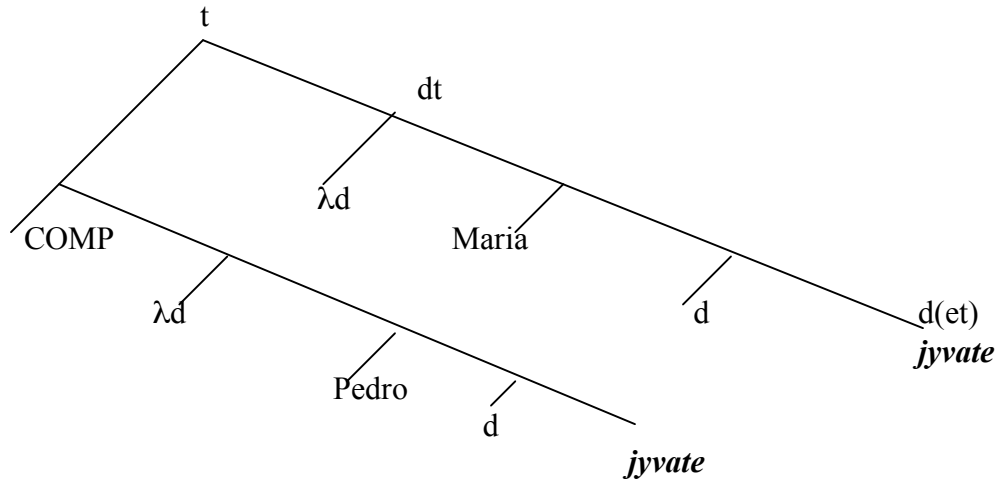
The relation expressed above considers all worlds such that:

For every accessible world w' I consider Mary’s height. The relation between $\forall w'$ and w is such that in w the maximal degree of Mary’s height is higher than the maximal degree of Mary’s height in all accessible w' .

$$\forall w' \in ACC_w: \max(\{d \mid \text{Height}_w(\text{Mary}) \geq d\}) > (\{d \mid \text{Height}(\text{Mary})_{w'} \geq d\})$$

So far we have stated that Guaraní accepts clausal comparatives. This allows us to analyse any kind of comparative, as well phrasal comparatives, applying von Stechow’s (1984) proposed analysis. Let’s consider (47)

- (47) Maria i - jyvate- ve Pedro- gui.
 Maria kop tall- more Pedro- than
 Maria is taller than Pedro.



The meaning of the sentence *Maria ijvateve Pedrogui* allows us to introduce the COMP-operator as well in Guaraní syntax-semantic interfaces. It expresses a relation between two sets of degrees: the maximal degree in the set of the degrees of Maria's height, which exceeds the maximal degree in the set of degrees of Pedro's height.

$$[\text{COMP}] = \lambda x_{dt}. \lambda y_{dt}. \max(x) < \max(y)$$

Compared to the POS-operator, the COMP-operator does not consider a neutral domain on the scale of height at all. It simply compares two sets of degrees:

- (48) Maria i- karape. Maria i - jyvate- ve Pedro- gui
 Maria kop small. Maria kop tall- more Pedro- than
 Maria is small. Maria is taller than Pedro.

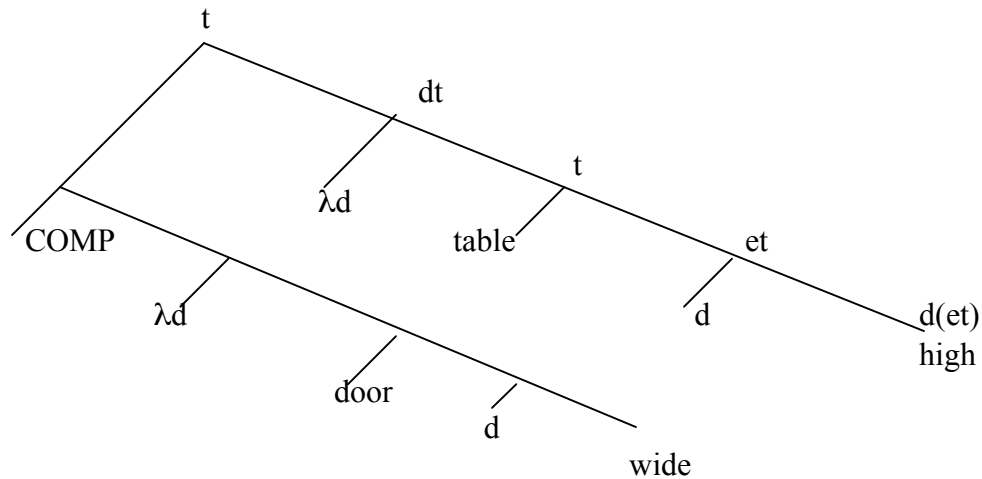
(48) shows this. If the POS-operator were applied here, the set of degrees to which Maria is tall must have been larger than or at least as large as the maximum degree of the interval in the neutral domain. But it isn't. In this case the maximal degree of Maria's height simply exceeds the maximal degree of Pedro's height. Since Maria is small, the LF must be characterized by the POS-operator:

$[[\text{POS}_{N,I}]^g = \lambda D. \forall d' \in g(N(I)): D(d')$

$[[\text{Maria is small}]^g = 1$ iff

$\forall d' \in g(N(I)): \text{Height}(\text{Mary}) < d'$

3.4 The subcomparative again



Again we compare two sets of degrees: the set of degrees to which the door is wide with the set of degrees to which the table is high, where the maximum degree to which the table is high exceeds the maximum degree to which the door is wide:

$$\max \{d: \text{the table is } d\text{-high}\} > \max \{d: \text{the door is } d\text{-wide}\}$$

These so-called subcomparatives are acceptable in English, although it might appear strange that two degrees on obviously different scales (scale of width & scale of height) are comparable. On the other hand we compare degrees that use the same units to express their extension (be it centimeters or meters).

Beck (2007, chapter “Crosslinguistic variation in the Expression of comparison”) described various languages that do not allow a subcomparative (e.g. Japanese, Russian).

But why does Guaraní in particular not accept subcomparatives?

3.5 The POS-Strategy (Krasikova 2007)

Krasikova (2007) proposed that in Russian the degree argument of the gradable predicate is occupied by the POS-operator unless it is occupied by the COMP-operator. She concluded that the POS-operator bans degree questions, measure phrase constructions and subcomparatives. But why should we argue that the POS-operator appears e.g. in subcomparatives if we simply compare two sets of degrees again? Why should Guaraní not be able to accept the same kind of constructions as English does?

A further look on some empirical data might help us to highlight more differences between the two languages.

3.5.1 *Measure phrases in Guaraní

Krasikova took the following data of Russian to prove that a morphological positive form of the adjective can't combine with a degree argument in measure phrases since there is only one degree argument slot where both must stem from:

- (49) *Эта юбка 40 см длинная.
Eta jubka 40 cm dlinnaja.
this skirt 40 cm long
Intended: 'This skirt is 40 cm long.'

In Russian a construction like (50) is prominent:

- (50) Эта юбка длиной 40 см.
Eta jubka dlinoj 40 cm.
this skirt length-Instr 40 cm
'This skirt is 40 cm long.'

For Guaraní we consider the following data that are correspondent to the Russian ones:

- (51) *Pedro i- tuja 45 ary.
 Pedro is- old 45 year
 Pedro is 45 years old.
- (52) Pedro ohasahina 45 ro'y.
 Pedro carry-prog 45 summer
 Pedro is 45 years old.
- (53) *Pe juguata kuri potei ara ipuku
 this journey past six days long
 This journey was six days long.
- (54) Pe juguata hia're- kuri potei ara
 this walk take- past-m six day
 This journey took six days.

Interviews with native speakers have shown that Guaraní doesn't allow forming measure phrases at all. All interviewees considered the positive form of the adjective as the resulting problem in (51) and (53). In these two cases a POS-operator is integrated into the logical form where

$$[[\text{POS}_{N,I}]]^g = \lambda D. \forall d' \in g(N(I)): D(d')$$

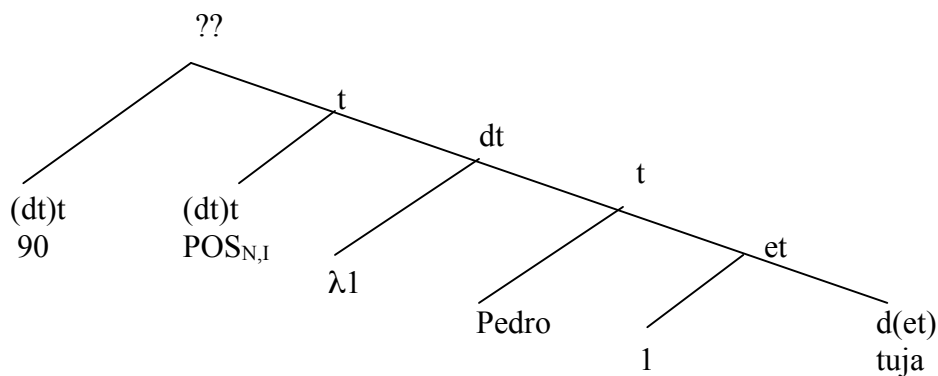
Since $[[\text{POS}_{N,I}]]$ expresses a relation between two sets of degrees, where one of them is an interval in the neutral domain (see 1.0), one might argue that these two sentences are simply not acceptable because the degree arguments given in (51) and (53) do not exceed the maximum of the interval in the neutral domain. Exhausting these arguments then, the sentences could be acceptable:

(55) *Pedro i- tuja 90 ary.
 Pedro is- old 90 year
 Pedro is 90 years old.

(56) *Pe juguata kuri potei ary ipuku
 this journey past six year long
 This journey was six years long.

(55) and (56) prove that the argumentation above failed which means that the POS-operator in general forbids measure phrases of any kind in Guaraní. The probable reason for this is that both, POS-operator and degree argument need to be bound in the LF by $\lambda 1$, but of course they can't at the same time. The LF has to fail. We can assume the same reasons for the unacceptability for measure phrases in Guaraní as Krasikova did for measure phrases in Russian.

See proposed LF below:



In English, since “old” in (9) doesn't require the presence of a POS-feature, the degree argument (90) can host the measure phrase.

3.5.2 The same argument for degree questions

Krasikova showed that for degree questions in Russian a similar problem appears.

The adjective carries with it a POS operator and therefore makes impossible a combination with another degree argument (in this case the wh-constituent):

- (57) *Какая высокая Маша?1
kakaja vysokaja Masha?
how tall M.
Intended: 'How tall is Mary?'

Again, noun constructions like (58) are accepted by speakers:

- (58) Какой у Маши рост?
kakoj u Mashy rost
what with M. height
'How tall is Mary?'

The same phenomenon appears in Guaraní degree questions:

- (59) *Mba'eita ituja Pedro?
How old Pedro?
How old is Pedro?
- (60) Mboy ary piko oguereko Pedro?
How many years question has Pedro?
How old is Pedro?

Interviewees approved that putting an exclamation mark instead of a question mark in (60), the sentence would only make sense if Pedro's age was above an interval in the neutral domain on the scale of age (see (12)).

- (61) Mba'eita ituja Pedro!
How old Pedro!
How old Pedro is!

To interpret this exclamative, we will need at least the semantics of the corresponding positive sentence:

$[[\text{Pedro ituja}_{N,I}]]^g =$

$\lambda D. \forall d' \in g(N(I)): D(d')$

$\forall d' \in g(N(I)): \text{Age}(\text{Pedro}) > d'$

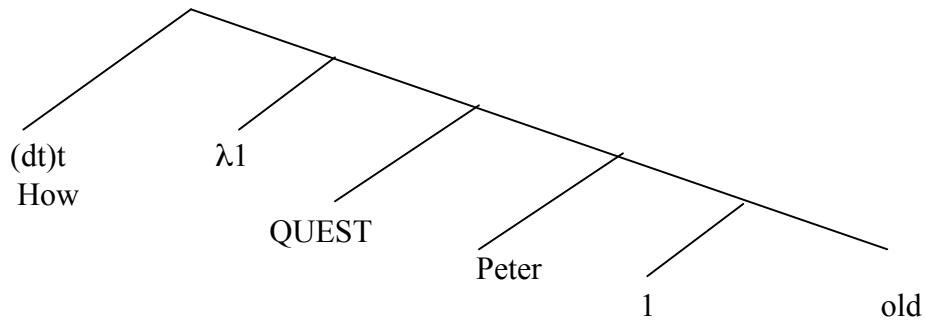
For the exclamative sentence (12) we would definitely need more.

The degree to which Pedro's height exceeds the neutral domain is so big that it causes my surprise/horror etc.

The degree question *How old is Peter?* is a constituent question that asks for all degrees of Peter's age on the scale of age. See its LF below roughly according to Karttunen:

(62) How old is Peter?

$\lambda w. \lambda p. \exists d: p = \lambda w'. \text{age}_{w'}(\text{Peter}) \geq d \ \& \ p(w)$



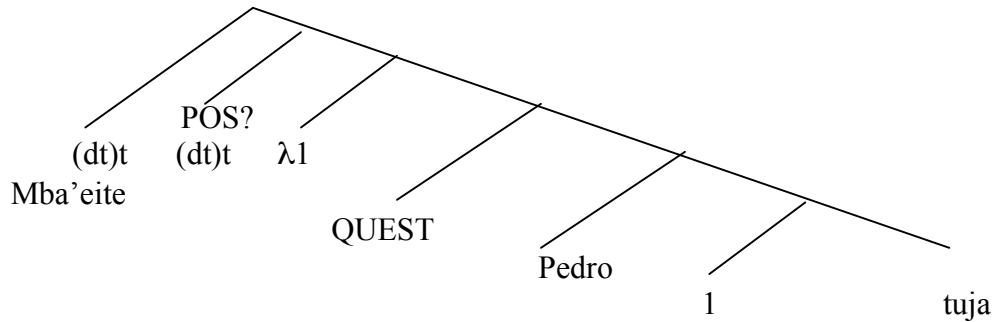
In this tree *how* would be interpreted as an existential quantifier over degrees.

$[[\text{How}]] = \lambda D_{dt}. \exists d: D(d)$

Above I argued that *tuja* in Guaraní carries with it the POS-operator, which seems to be obvious from (12). The following LF according to Krasikova's proposal gives evidence to the fact that degree questions in Guaraní always fail to be acceptable.

- (63) *Mba'eita ituja Pedro?
 How old Pedro
 How old is Pedro?

$\lambda w.\lambda p. \exists d:p = \lambda w'. \text{age}_w(\text{Pedro}) \geq d \ \& \ p(w)$



(63) has to fail because POS and QUEST have to stem from the same position, namely the degree argument slot of the adjective.

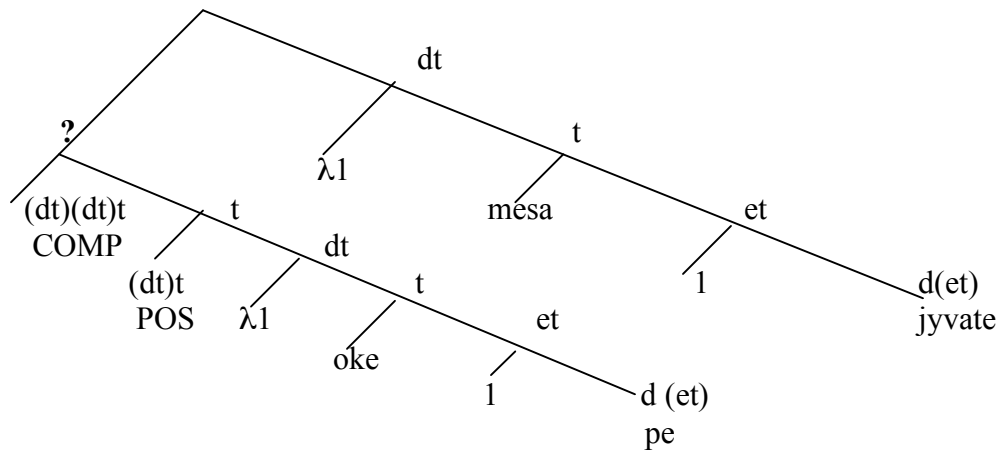
3.5.3 No subcomparatives in Guaraní

- (64) *Pe mesa i- jyvate- ve pe oke i- pe- gui
 this table kop high- more this door kop wide- than
 This table is higher than this door is wide.

Following the POS-Strategy, we finally have to give reasons for the unacceptability of subcomparatives in Guaraní. Again it is the POS-operator that bans this possibility as Krasikova argued for the Russian data:

- (65) *Дверь выше, чем полка широкая.
 Dver'vyshe chem polka shirokaja.
 Door high-er than shelf wide
 Intended: 'The door is higher than the shelf is wide.'

The POS-operator stems from the degree argument slot of the adjective, where the COMP-operator should stem from as well. The further binding of the COMP-operator is impossible:



So far I have argued that the requirement of the POS-operator bans certain constructions such as measure phrases, degree questions and obviously the subcomparative in Guaraní. This means that the Guaraní language is much more restricted in the use of adjectives in general and has to look for other possibilities to express degree questions or mass phrases (see (52), (54) or (59)). Interesting now is to have a look on equatives and superlatives.

5.4 Equatives, superlatives & morphology

Forming equatives in Russian is impossible as well: again the adjective carries a POS operator with it. That doesn't prohibit this kind of constructions, but it restricts it:

(66) compares two sets of degrees with each other where in both the maximal degree of the adjective on the relevant scale must be above the interval on the neutral domain. A noun-driven construction like (67) expresses more precisely what the equative means.

- (66) Петя такой же высокий как и Маша.
 Petja takoj zhe vysokij kak i Masha.
 P. that part. tall as also M.
 'Peter is as tall as Mary is.'

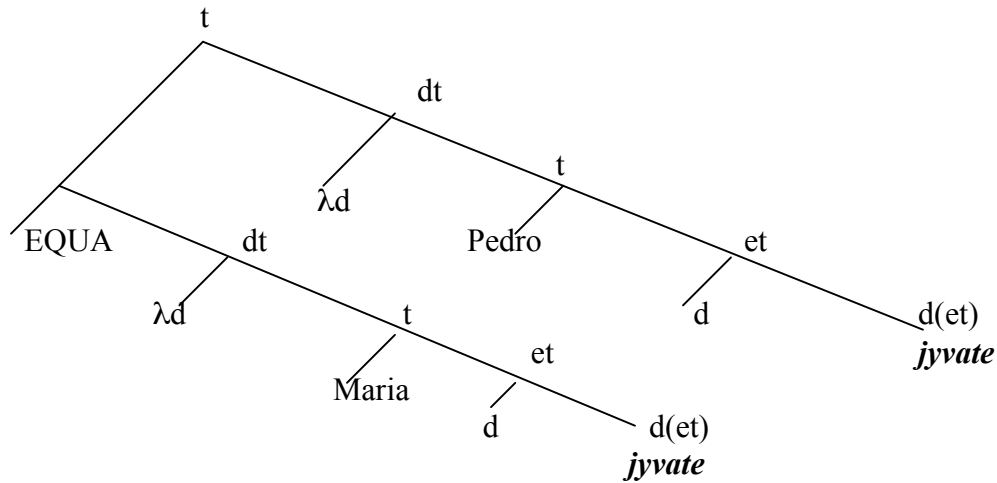
- (67) У Пети такой же рост как и у Маши.
 U Peti takoj zhe rost kak i u Mashi.
 with P. that part. height as also with M.
 'Peter is as tall as Mary is.'

As mentioned in the 0.1.2 we will need more data about the equative and the superlative. But those which are available by now leave space for some speculations.

One could make the assumption that equatives and superlatives in Guaraní must have a different structure than in English because of a possible POS-operator appearing in these constructions as well. At least data have shown that the equative exists in a quite similar form:

- (68) Maria I jyvate- te Pedro- icha.
 Maria kop tall exact Pedro- as
 Maria is as tall as Pedro.

If we excluded the possibility that the sentence didn't mean that Maria's and Pedro's degree of height were restricted by the POS-operator, this would strongly argue for the fact that an EQUA-operator behaves similar to the COMP-operator and propose the following LF:



[[EQUA]] = $\lambda x_{dt} . \lambda y_{dt} . \max (x) = \max (y)$ respectively

[[EQUA]] = $\lambda_{x_{dt}}. \lambda_{y_{dt}}. \max(x) \leq \max(y)$

Further data will have to prove that the -te-morpheme is definitely needed in equative constructions and that these constructions are really equative constructions.

On the other hand, similar constructions to (68) seem to be avoided in Guaraní and others seem to be more prominent:

See

(69) Maria ha- Hua ojo- avegua
 Maria and Juan same age
 Maria and Juan have the same age.

(70) ?Maria I tuja- te Pedro- icha.
 Maria kop old exact Pedro- as
 Maria is as old as Pedro.

The interpretation of (70) hasn't been proved at all.

But it interestingly Guaraní offers a prominent version like (69).

Striking seems to be that in Russian attempts to form an equative by using gradable adjectives, we have a morphological form that equals the positive form of adjectives, and as Krasikova states, the semantics of the POS-operator comes in. Guaraní gives us another phenomenon: the morphological positive adjective form is suffixed by a -te morpheme and the POS-operator does not seem to come in here.

We can add to these assumptions what we get from superlatives in Guaraní:

(71) Maria amboguata pya'e- ve- kuri mbayruguata
 Maria drive fast- more past car
 Maria drove the fastest car / a faster car?

(72) Maria ojogua petei aranduka hepy- veva umi aranduka
 Maria bought a book expensive most those book
 apyte- gui avave nd- ojogua- i- va.
 among- than nobody not bought neg pro
 Maria bought the most expensive book among those books that nobody bought.

In both cases the morphological positive adjective form is suffixed by a morpheme (-ve / -veva). The adjectives in the examples are not including semantics of the POS-operator.

Let's keep that in mind for the proposals of the following section.

3.6 Short summing-up

The POS-strategy seems to be a successful attempt to analyse the non-acceptability of measure phrases, degree questions and subcomparatives in Guaraní. An analysis of equatives and superlatives must follow to embed these constructions into the analytical framework.

3.6 A Feature strategy? (in cooperation with Krasikova)

So far we were able to give a reliable analysis for the unacceptability of measure phrases, degree questions and subcomparatives in Guaraní. But how can a reliable analysis for syntactical/semantic descriptions find morphological arguments?

We can assume that languages differ with respect to interpretable morphological features of degree morphemes.

(71) Maria i- jyvate.
Maria kop tall
Maria is tall

(72) *Pedro i- tuja 90 ary.
Pedro is- old 90 year
Pedro is 90 years old.

(73) *Mba'eita ituja Pedro?
How old Pedro
How old is Pedro?

(74) *Pe mesa i- jyvate- ve pe oke i- pe- gui
this table kop high- more this door kop wide- than
This table is higher than this door is wide.

We assume that all null-morphemes of the gradable adjectives in (71) – (74) carry the interpretable [+POS]-features.

- (75) Maria i - jyvate- ve Pedro- gui.
 Maria kop tall- more Pedro- than
 Maria is taller than Pedro.
- (76) ?Maria I jyvate- te Pedro- icha.
 Maria kop tall exact Pedro- as
 Maria is as tall as Pedro.
- (77) Maria ojogua petei aranduka hepy- veva umi aranduka
 Maria bought a book expensive most those book
 apyte- gui avave nd- ojogua- i- va.
 among- than nobody not bought neg pro
 Maria bought the most expensive book among those books that nobody bought.

In (75) – (77) all gradable adjectives are suffixed by different morphemes. We have to assume that suffixes of gradable adjectives and the [+POS]-feature are incompatible. We temporarily say that degree morphemes of gradable adjectives in equative, superlative and comparative constructions in the Guaraní language carry a [-POS]-feature or rather a feature that corresponds to them ([+ EQUA], [+ SUP], [+ COMP]).

4.0 Summary and Conclusions

What conclusions can we draw from all this?

Regarding English and Guaraní we have seen that these two languages differ with respect to certain constructions (measure phrases, degree questions and subcomparatives) and equal with respect to others (positive and comparative). Guaraní seems to behave much more restrictive and more homogeneous in the use of adjectives, whereas in English we can only judge by the context whether a morphological positive form is a positive or not.

We might say that in contrast to English adjectives, Guaraní ones are more standardized. At the same time we can integrate the phenomena of some languages into one analytical context. The unacceptability of measure phrases and degree questions in Guaraní, Russian, Spanish and French might possibly have the same source: a coming in POS-operator. On the other hand we know that German and English behave very similar to each other if we observe these constructions. We learn that there are no universal parameters for languages in comparison constructions, but we have to assume that there are certain parameters that must be taken into account for the analysis of comparison constructions in more than one language and that are not only individual.

Furthermore Guaraní seems to give a good example of a wide interaction of language intern criteria: we can integrate the morphology of adjectives into a semantic and syntactical approach to the analysis of comparison constructions. That could be a nice starting point to think about the morphology of adjectives in other languages like English. Which parameters or features allow us to talk about positives or to avoid a POS-operator? What are their sources?

Of course there is also lots of work left with Guaraní: the most interesting and urgent project is definitely a more profound research on equatives and superlatives. But as well intensional comparison or scope leave some wide space for further work.

5.0 References

Beck, Sigrid (2007): *HSK Semantics: Comparatives and Superlatives*
University of Tübingen, draft

Beck, Sigrid (2006): *Komparative: Anleitung zur sprachvergleichenden Datenerhebung, Version 1*, Tübingen

Heim, Irene (2001): *Degree Operators and scope* in Féry, Caroline & Sternefeld, Wolfgang (eds.): *Adiatur Vox Sapientiae* (Vol. 52). A Festschrift for Arnim von Stechow

Heim, Irene & Kratzer, Angelika (1998): *Semantics in Generative Grammar*.
Blackwell Textbooks in Linguistics. Malden: Blackwell Publishers

Krasikova, Svetlana (2007): *Degree Constructions in Russian & Bulgarian*,
University of Tübingen, ms.

Von Stechow, Arnim (1984): *Comparing Semantic Theorie of Comparison* in: *Journal of Semantics*, Vol. 3

Von Stechow, Arnim (2006): *Times as degrees*. University of Tübingen. ms.

6.0 Appendix

This part will briefly describe how Guaraní data were collected in Asunción, Paraguay.

A first very helpful step was Beck's "Anleitung zur sprachvergleichenden Datenerhebung, Version 1". It was a good overview about the required data and gave me the opportunity to start doing first researches in Guaraní grammar books, dictionaries etc. to get an impression of the language in general and of comparison constructions in particular. What I had to then was a translation of the required data from German into Spanish, since I knew that this would make things much easier in Paraguay, where Spanish is an official language as well and many people are able to speak both, Spanish and Guaraní. The primary informants were to me an important condition for the work. Fortunately I found Mrs. Maria-Eva Mansfeld, a native Guaraní speaker and "Guaraní teacher of the year 2006 in Paraguay" who could give me a profound overview and who made a first translation of the data. Since I am absolutely unable to speak Guaraní, I had to check the translations. Two more primary informants, working as Guaraní teachers or rather translators, checked the data or added some constructions which they considered as better / more frequent. Some problems occurred here, e.g. the fact, that Guaraní sometimes uses noun constructions instead of adjective ones, that the language is very context dependent and therefore the speakers had problems to create certain contexts etc. At the end I found myself with a all the data in German, Spanish and Guaraní and could make a first comparison. Where do problems appear? What doesn't seem to be clear? Which constructions seem to be strange / rare?

- (i) Maria ojogua petei aranduka hepy- ve- va avave
Maria bought a book expensive more mode nobody
nd- ojogua i- vaekue.
not buy neg past
Maria bought a more expensive book than nobody./ anyone
"Maria bought the most expensive book"

(i) for example was a striking sentence. I didn't understand at all why we shouldn't need a –gui morpheme here introducing a than-clause since we needed it in every other construction that dealt with comparatives.

Others were difficult to construct like (ii):

(ii) *Maria i- jyvate- ve Pedro- gui nda ha'e- i
Maria poss tall more Pedro- than not he(is) neg
Maria is taller than Pedro isn't.

Guaraní has negative island effects and therefore the creation of such a sentence is problematic. To me it seemed as if I had to say to somebody: create an unacceptable, strange sentence that nobody would ever say.

Some problems remained unsolved, others didn't. Often these were the most frustrating moments of the work: my own incapability to speak Guaraní and solve the problems by myself and with the help of my own intuitions.

The next big step was the creation of a questionnaire. I got the sentences and their meanings had been told to me. Now I had to create a questionnaire where I invented for every sentence an adequate scenario:

Por lo siguiente se dan algunas situaciones. Por cada situación se da una frase corespondiente en el Guaraní. Por favor lea bien las frases primero.

La tarea es de verificar si la frase realmente coresponde a la situación dada. Se dan 4 opciones:

(1) Sí, la frase coresponde totalmente a la situación y es correcta.

(2) Quizá

(3) Probablemente nó

(4) Nó, la frase no es corecta/no coresponde a la situación

(1) La altura de Maria es de 1,79 metro. La de Pedro es solo de 1,65 metro.

Maria ijyvateve Pedrogui.

(1) (2) (3) (4)

(2) *Juan y Diego hicieron una competencia de correr. Juan llegó primero, mucho antes que Diego.*

Juan onani pyae've Diegogui.

(1) (2) (3) (4)

This extract of the questionnaire only wants to illustrate the work. One might imagine that certain problems can occur here as well: it happened that the first secondary informants judged a similar, simple example with (4) (unacceptable). I didn't ask why – but when the second one judged it as well with (4), I asked him why and he told me that I wrote twice “r” instead of “v” and that the sentence was incorrect because of that orthographic mistake. It was highly important to be next to the secondary informants when they filled out the questionnaires and to ask questions in cases of unacceptability or simply when they were frowning.

Secondary informants help a lot to get a better understanding of a language. Ideally they are naïve with respect to the targets of the research and do not really know what is going on. They might offer more common constructions, simpler ways to express things etc.

Lastly I want to thank all the friendly people in Paraguay who supported my work with their patience and their generosity.

