Eberhard-Karls Universität Tübingen
Philosophische Fakultät

Comparative Constructions in Yoruba

Arbeit zur Erlangung des akademischen Grades
Magistra Artium (M.A.),

vorgelegt von Anna Howell.

Tübingen, den 03. Juli 2012

Acknowledgements

There are many people without whom this MA thesis would not have been possible. First and foremost, I am would like to thank my supervisor, Sigrid Beck for her constant support and insight. I also thank her for everything that I have learned in the five *Oberseminar* I attended over the course of my MA. I also thank the members of the SFB 833 Project C1: Vera Hohaus, Stefan Hofstetter, Remus Gergel, Konstantin Sachs and Polina Berezovskaya, who patiently listened to this work in its many stages and were always ready with new ideas and suggestions. Special thanks go to Vera Hohaus, who devoted many hours of her time to discussing everything from my data, to fieldwork methodology, to theoretical problems with me. I also thank Nadine Bade, Sonja Tiemann and Lucas Champollion for interesting discussion and many enjoyable lunch breaks.

I would sincerely like to thank my Yoruba consultants: Olatunbosun Adekogba, Taiwo Ojurongbe, Omotayo Ayeni and Oluwafemi Agboola, for teaching me about their language, for patiently answering my sometime bizarre questions and for inspiring new ones.

I am indebted to Wolfgang Sternefeld, my first point of contact at the University of Tübingen for all of his help getting oriented in a new university system and navigating its complicated *Prüfungsordnung*. I am also very thankful for the enjoyable seminars I took with him and for his interest in my work.

Two professors from my BA studies in McGill deserve particular thanks for helping me come to Germany in the first place: Bernhard Schwarz, my BA thesis supervisor, who made me realize I could learn more from an MA in Tübingen than I might by staying in Canada, and Karin Bauer, one of my German Studies professors, who was a great help when it came to applying for funding from the DAAD.

I thank the DAAD for financial support over the course of my MA. Research for this thesis was conducted within Project C1 of the Collaborative Research Center 833 "The Construction of Meaning", funded by the German Research Foundation.

Finally, there are a great many people outside of the academic world without whom my MA would not have been possible. First of all, I thank my family, especially my Mom, my Dad and my sister Joey, for their unfailing support. I would also like to thank the Mihr family for inviting me into their family and making my first encounter with Germany such a good one. Last of all, I thank my friends, both my new(er) friends in Germany and the old ones from Toronto and Montreal for always being there when I need them.

Eigenständigkeitserklärung
gemäß § 15, Abs. 2 Magisterprüfungsordnung

Hiermit versichere ich, dass ich die vorliegende Arbeit eigenständig verfasst, keine anderen als die angegebenen Quellen und Hilfsmittel benutzt und deren Übernahme an den entsprechenden Stellen einzeln kenntlich gemacht habe.

Tübingen, den 03. Juli 2012

Zusammenfassung in deutscher Sprache
gemäß § 14, Abs. 3 Magisterprüfungsordnung

Diese Arbeit schlgt eine Semantik fr Vergleichskonstruktionen in Yoruba (Nierg-Congo, Nigeria) vor. Anhand von Daten, die vom Autor durch die Feldforschung mit vier Yoruba-Muttersprachlern in Deutschland gewonnen hat, argumentiert sie gegen die Behauptung von Beck et al (2009),die besagt, dass Yorubas Grammatik die Bindung von Variablen vom semantischen Typ $\langle d \rangle$ nicht zulsst. Stattdessen schlgt diese Arbeit vor, dass die Daten, die fr Beck et al. (2009) als Evidenz gegen Gradabstraktion gelten (z.B. die Abwesenheit von Skopusambiguitten in Vergleichskonstruktionen in Yoruba),durch die Annahme erklrt werden, dass Maphrasen in Yoruba Grade (type $\langle d \rangle$) und nicht Quantoren ber Grade (type $\langle \langle d, t \rangle t \rangle$) sind. Es wird argumentiert, dass die Bindung von Gradvariablen in einer anderen Konstruktion, nmlich freie Relativstze, die Grade beschreiben, notwendig ist.

Beck, Oda und Sugisaki (2004) schlagen einen Parameter vor, um eine Reihe von Unterschieden zwischen Vergleichskonstruktionen im Englischen und im Japanischen zu erklren: der "Degree-Abstraction Parameter"(DAP). Sie behaupten, dass, wenn in einer Sprache bestimmte Konstruktionen und Effekte nicht vorhanden sind (Skopusambiguitt in Vergleichskonstruktionen, Negativinselneffekte, Grad-Fragen, Subcomparative), wie im Japanischem, gilt dies als Beweis fr eine negative Setzung des DAPs (keine Abstraktion ber Grade). In einer auf Beck, Oda und Sugisaki (2004) aufbauenden Studie untersuchen Beck et al. (2009) die Setzung des DAP (sowie zwei weitere Parameter) in 17 verschiedenen Sprachen, unter anderem Yoruba. Sie schlieen, dass Yoruba -DAP ist.

Gradfragen in Yoruba werden mit einer Serial Verb Construction (SVC) gebildet. Ein Verb *ju* (der Komparativoperator) kombiniert sich mit einem gradierbaren Verb und nimmt als Objekt das Objekt zum Vergleichen und als Subjekt das Subjekt vom Vergleich, wie in (1).

(1)   *Joko yìí da   ju   iyen   lọ*   .
        Chair this be.good exceed that.one STANDARD.MARKER
        "Dieser Stuhl ist schoener als Diesen."

Wir schlagen eine Semantik vor, in der *ju* ein drei-stelliges Prdikat ist, das als erstes Argument eine Gradprdikat (Typ $\langle d \langle e, t \rangle \rangle$) nimmt, dann das Objekt (von Typ $\langle e \rangle$ oder Typ $\langle d \rangle$) und dann der Subjekt (Typ $\langle e \rangle$):

(2) $[\![ju_1]\!] = \lambda P_{\langle d, \langle e,t \rangle \rangle}.\lambda x.\lambda y.Max(\{d : P(d)(y)\}) > Max(\{d : P(d)(x)\})$
        $[\![ju_2]\!] = \lambda P_{\langle d, \langle e,t \rangle \rangle}.\lambda d.\lambda y.Max(\{d' : P(d')(y)\}) > d$

Wir untersuchen zunchst Vergleichskonstruktionen wie das Beispiel in (3), das von Beck et al (2009) nicht untersucht wurde.

(3)   *Omotayo le sare   ju   bi Ade ṣe le sare   lọ.*
        Omotayo can run.fast exceed how Ade Q can run.fast STANDARD.MARKER
        Ömotayo kann schneller rennen als Ade es kann."

Wir argumentieren, dass diese Konstruktionen fr den Schluss, dass Yoruba -DAP ist, problematisch sind, weil sie Gradbeschreibungen (von typ $\langle d \rangle$) sind. Wir zeigen, dass um eine passende Bedeutung fr diese Relativstze, die auch auerhalb von Vergleichskonstruktionen verwendent werden, zu generieren, eine Abstraktion ber Graden notwendig eine. Wir schlussfolgern, dass Yoruba +DAP sein muss.

Danach wenden wir uns den Daten von Beck et al (2009) zu, anhand welcher Yoruba als -DAP klassifiziert wurde. Es wird beobachtet, dass aus den verschiedenen Konstruktionen die im Zusammenhang mit der DAP untersucht wurden, alle auer Skopusambiguitt anders erklrt werden knnen. Die Abwesenheit von Negativinselneffekte, z.B., wird erklrt, weil ellipsisbasierten klausale Vergleichskonstruktionen (e.g. *I am taller than Mary is.*) in Yoruba aus anderen Grnden nicht mglich sind.

Die relevante Skopusambiguitten werden nochmals untersucht. Wir beobachten, dass um die relevanten, in Heim (2001) beschriebene Ambiguitten herzuleiten, sind entweder Vergleiche von Minderheiten (so gennanten "less"comparatives), oder Maphrasen vom Typ $\langle \langle d, t \rangle \rangle$ ntig. In Yoruba hingegen werden "less"comparatives durch overten Negation und einem quative gebildet. Wir argumentieren zudem, dass Maphrasen in Yoruba Grade und nicht Gradquantoren denotieren.

Wir schlussfolgern, dass unsere Analyse von Vergleichskonstruktionen in Yoruba den Vorteil ber dem von Beck et al. (2009), weil wir die Abwesenheit von Skopuseffekte erklren knnen und gleichzeitig die Mglichkeit von Abstraktion ber Grade behalten. Diese Arbeit zeigt auerdem, dass die Diagnostika von Beck, Oda, Sugisaki (2004) und Beck et al. (2009) fr die Setzung des DAPs problematisch sind, weil Skopusambiguitten eine sehr wichtige Rolle spielen, und zugleich durch viele verschiedene andere Faktoren beeinflusst sind.

Contents

0.1 Introduction

Over the past two decades, data from cross-linguistic variation has become increasingly important in shaping semantic theory. While many of the foundations of semantic theory as we know it today were the result of philosophical introspection by linguists about their own language, increasingly, linguists are looking at differences between languages, and more importantly the patterns in these differences to refine and challenge standard assumptions. (Chierchia 1998) on the meanings of nouns, (Matthewson 2010) on modals, (Bittner 1995) on indefinites are just a few examples. One area in which cross-linguistic investigation is actively being pursued is degree semantics, the branch of semantics that deals with gradable expressions, comparison and measurement. Cross-linguistic data has been used, for example, to challenge the standard assumptions about the basic meaning of gradable predicates (Bogal-Albritten 2010), or the form that the comparative operator can take (Bhatt and Takahashi 2007).

This thesis looks in particular at a set of parameters proposed by Beck et al. (2011) to explain correlations between the availability of certain degree constructions in a given language. More specifically, we will be concerned with the so called Degree Abstraction Parameter (DAP). The DAP was first proposed by Beck, Oda, and Sugisaki (2004) for Japanese and its setting determines whether a particular interpretational mechanism, the ability to abstract over degrees (an ontological entity proposed by the standard theory) to form complex predicates of degrees, is available in a given language. Beck et al. (2011) propose that the unavailability of a cluster of constructions (including absence of Negative Island Effects in comparatives, lack of scope ambiguities in comparatives, absence of degree questions, direct measure phrases and subcomparatives) is indicative of a -DAP setting. They conclude that Yoruba, a language in the Niger-Congo family spoken primarily in Nigeria, is such a language (among others).

This thesis re-examines the data on Yoruba from Beck et al. (2011) and presents new data indicating that Yoruba is not -DAP after all. A construction not considered by Beck et al. (2011), a free relative clause which we will argue is derived by abstraction over a degree argument is used to prove that degree-abstraction is an available interpretational mechanism in Yoruba. We propose an alternative account of Yoruba comparison constructions inspired by the grammatical configuration in which they are found. Yoruba is described by Stassen (1985) as having an "exceed"-type strategy for expressing comparisons, that is, comparisons are made via a verb meaning roughly "to exceed" with the comparee as its subject and the standard of comparison as its direct object.[1] Yoruba "exceed" comparatives are special because they are constructed using Serial Verb Constructions (SVCs), an uncommon construction in Indo-European languages in

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[1]We will use the terms "comparee" and "standard of comparison" throughout to designate the object the comparison is being made about and the thing it is being compared to respectively. For example in the English comparative *I am taller than my sister.* I am the comparee and my sister is the standard of comparison.

which two or more verbs occur together in a sentence without any overt marking of co-ordination or subordination and behave as an indivisible predicate. In Yoruba comparison constructions, the "exceed" verb and a state verb expressing the relevant gradable property appear together in an SVC. We develop a semantics for the comparative with a maximally transparent syntax/semantics interface, in which the comparative is a three-place operator which combines first with the gradable verb and then with the object and the subject. We also look at Yoruba differential measure phrases and note some differences from their English counterparts which leads to the conclusion that they are degree descriptions (of type $\langle d \rangle$) rather than quantificational expressions (of type $\langle\langle d, t \rangle t \rangle$). We argue that our analysis of the comparative and of differential measure phrases provides an alternative account for the lack of scope ambiguities reported in Beck et al. (2011), which was taken there to be due to the -DAP status of Yoruba.

The thesis is organized as follows: The first chapter presents background on degree semantics, standard accounts of various degree constructions in English and summarizes some relevant cross-linguistic research. Chapter Two introduces the data from Yoruba. It starts with an overview of several relevant aspects of Yoruba grammar and then moves on to an account of degree constructions, starting with gradable predicates and then moving on to the comparative (including differential comparatives and comparatives with complex standards. In a final chapter, we sum up and discuss what the data can tell us about the question of cross-linguistic variation in the semantics of comparison, and what it means for cross-linguistic semantics more generally. We conclude by considering some questions for further investigation.

1 Degree Semantics in English and Cross-Linguistically

This section provides a short introduction to the semantics of comparison and gradability. After outlining (in Section 1.1) what is meant by *degree semantics* and *degrees*, we give a brief summary of the analysis of various degree constructions in English, the language for which the majority of research in this field has been done (Section 1.2). Section 1.3 then deals with degree semantics from a cross-linguistic perspective. The following discussion assumes no prior knowledge on the topic of degree semantics, but it is carried out in the type-driven semantic framework of Heim and Kratzer (1998) and a basic familiarity with such a framework is assumed throughout.

1.1 Introduction to Degree Semantics

Degree semantics is the branch of semantics which deals with expressions that denote a gradable property and grammatical constructions which operate on them. A gradable property is one with respect to which the objects in its domain can be ordered (Christopher Kennedy 1999, p. 4). For example, the property of being big is gradable, while being warm blooded is not. To date, much of the discussion of gradability in natural language has centred around analysis of comparison constructions, like (1), (e.g. Seuren (1973), von Stechow (1984*a*), Heim (1985), Larson (1988), Heim (2001), Schwarzchild and Wilkinson (2002) among many others) as well as on the meaning of gradable adjectives, like *long, clever* or *cold* (Bierwisch (1989), Klein (1980), Christopher Kennedy (1999), a.o).

(1)   Blue whales are bigger than Humpbacks.

However, the question of how gradability is encoded semantically is relevant for a much wider range of constructions, some examples are given in (2) , and has more recently been put to work outside the adjectival domain, for example in the analysis of telicity in verbs (Kennedy and Levin (1999)) and quantifiers like *most* (Hackl (2009)).

(2)   EQUATIVE
       The blue whale is as long as a Boeing 737.
       MEASURE PHRASE CONSTRUCTION
       Its flippers alone are 3 to 4 meters long.
       SUPERLATIVE

It is the largest animal known to have lived on earth.

ENOUGH/TOO

Its main arteries are big enough for a human to swim through.

A standard assumption in much of the semantic literature on gradability is that it is encoded semantically with the help of a novel ontological entity: DEGREES. A degree is a point among a totally ordered set of points, or SCALE, ordered with respect to a particular dimension, such as temperature, mass or physical extent [1].

Individuals can be mapped to a point on a scale, assuming they possess the gradable property in question to some degree, with the help of a measure function. We will see in the next section that measure functions are at the heart of gradable adjective meanings. Another way of thinking about the relationship between scales, individuals and degrees goes back to Cresswell (1977) who shows that from the ordering, $\geq_p$, imposed on the set of individuals in the domain of a particular gradable property we can define equivalence classes of individuals such that for all individuals, a and b, in a given equivalence class $a \geq_p b$ iff $b \geq_p a$. By assigning a value to each equivalence class, we form a scale.

Before moving on to show how degrees are used to compositionally derive the truth conditions of comparisons and other degree constructions, I will briefly address one potential question with respect to degrees and degree semantics, namely: Are degrees really necessary to account for the semantics of gradable adjectives and related constructions, or could we develop a suitable semantics using only familiar semantic types? In fact, some linguists, notably Klein (1980), have argued against using degrees to capture the meaning of gradable adjectives. Klein takes them to be of semantic type $\langle e, t \rangle$ like other adjectives and introduces gradability through the notion of a contextually determined COMPARISON CLASS . Klein gives the example in (3) as an illustration of the idea of a comparison class.

(3)   Lana is smart

Uttered in a context where Lana is a chimpanzee, (3) would be taken to mean that Lana is smart relative to other chimps. Formally, our lexical entry would look something like (4).

(4) $[[tall]]^c = \lambda x.\ x\ counts\ as\ tall\ in\ c.$

Under Klein's analysis, a comparative like *Mona is cleverer than Jude* asserts that there is a contextually determined comparison class such that Mona counts as clever in c and Jude does

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[1]The dimension need not be associated with a particular measure, so it is also possible to have a foaminess scale or a laziness scale.

not. Thus, the lexical entry for the comparative will look something like this (5). [2]

(5) $[[\text{ er}]] = \lambda x.\lambda y.\exists c\ [\text{ tall (y) in c and } \neg \text{ tall (x) in c}]$

It has, however, been proven by von Stechow (1984a) von Stechow (1984b) that, while such an account may be enough to account for the positive and simple comparatives, it is insufficient to derive the correct meaning for more elaborate degree constructions such as differential comparatives, subcomparatives and measure phrase constructions. In the next section we will turn to the analysis of such constructions in English and, where applicable, demonstrate that a degree-less approach will not suffice. We will return later to the question of whether this is the case for all languages, or whether this is a point of variation.

1.2 Degree Constructions in English

The analysis presented in this section will be heavily based on von Stechow (1984a) von Stechow (1984b), which despite being almost 30 years old, remains one of the most influential works on the subject of degree semantics. This is often referred to, for example in a recent handbook article (Beck 2011) as the "standard theory". This section is not meant to be a comprehensive review of the literature on English degree constructions (this would be well beyond the scope of this work), rather it is intended to serve as a point of departure for our analysis of the Yoruba data. For this reason, many important topics will not be discussed here. The reader is referred to the above mentioned handbook article on degree constructions and references therein for a more complete discussion. We will begin this section with a short discussion of the semantics of gradable adjectives (1.2.1) followed by the comparative (1.2.2) and related constructions (1.2.3) then conclude with a discussion of measure phrase constructions and degree questions (1.2.4).

1.2.1 Gradable Adjectives

In English, degree constructions such as the comparative, the superlative or equatives are constructed around a gradable adjective. Therefore, before looking at these constructions, we must first discuss what we take adjectives like *tall*, *clever*, or *ugly* to mean. Many linguists, going back as far as Cresswell (1977) and von Stechow (1984a) take gradable adjectives to denote relations between degrees and individuals (type $\langle e, \langle d, t \rangle \rangle$). This is still the predominant view today. Under this approach, the denotation of a gradable adjective like *tall* looks something like (6).

(6) $[[\text{ tall }]] = \lambda d.\lambda x.\ \text{height(x)} \geq d$

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[2]No lexical entry is given explicitly in Klein 1980, but this is my adaptation of what a lexical entry for *-er* would look like under his proposal.

In words, *tall* denotes a function which maps a degree and an individual to true iff the individual is tall to AT LEAST that degree of height.

This is not the only meaning we could have chosen. Firstly, we have adopted a monotonic semantics for gradable adjectives (i.e. one in which degrees are mapped to individuals if the individual reaches that degree or higher). One could, however, conceive of a semantics for gradable adjectives which maps a degree and an individual to true if and only if the individual is tall to exactly that degree. A recent proposal by Beck (to appear b) suggests that while certain adjectives (dimensional adjectives) have denotations of the first kind, others (non-dimensional adjectives) have denotations of the second kind. Another variant we might have adopted is that of Christopher Kennedy (1999) who suggests that the basic meaning of a gradable adjective is a measure function (a function which maps individuals to the maximal degree to which they possess a gradable property, type $\langle e, d \rangle$) which subsequently combine with covert morphology to yield the appropriate semantic type for the construction it is found in. While the standard theory denotation is not itself a measure function, it does contain one as its core ingredient, in (6), for example, *height(x)* is the measure function.

We are now in the position to analyse simple measure phrase constructions like the one in (7). At this stage, we make the simplyfing assumption that measure phrases are of type $\langle d \rangle$. We will see in 1.2.4 that there is some evidence for analysing (at least some) measure phrases as degree quantifiers rather than degree descriptions.

(7)   Mary is 5 feet tall.
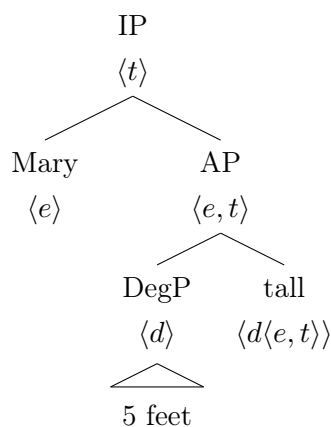
Under this kind of analysis, the positive form of gradable adjectives (8) becomes somewhat more complicated and this is part of what motivates its detractors (Klein 1980).

(8)   Kale is healthy

The intuitive meaning of (8), namely that the subject of the positive construction is tall to above a contextually determined average degree, does not follow directly from the meaning we have proposed for gradable adjectives. In fact, without making further assumptions, the degree argument of the gradable adjective appears to remain unfilled. To explain such constructions, many linguists, following von Stechow (1984a) assume that this meaning is derived with the help of a silent degree head (POS) with the following denotation. (The formulation we adopt for POS is from von Stechow (2009)):

(9) $[[\text{POS}]]^g = \lambda A_{\langle d,t \rangle}.\forall d \in g(N)(S_A)A(d)$ where N is a contextually determined function that gives the neutral segment of the scale in a particular context. S_A is the scale on which the set of degrees A are located.

This lexical entry derives the desired truth conditions for (8): It asserts that for all degrees d in the neutral interval (i.e. that are neither healthy nor unhealthy), Kale is healthy to at least degree d. In other words, assuming that healthiness is downward monotone the maximal degree of healthiness of Kale must fall above the neutral interval.

1.2.2 The Comparative (Basic)

The account presented here is Heim (2001)'s analysis which builds on the one in von Stechow (1984a,b). Under this account, the comparative operator is a quantifier over degrees (type $\langle \langle d,t \rangle, \langle \langle d,t \rangle, t \rangle \rangle$) which takes a set of degrees provided by the *than* clause of a comparative as its first argument and a set of degrees provided by the matrix clause as its second [3]. It maps them to true if the maximal degree of the matrix clause set exceeds the maximal degree of the *than* clause set. (The denotation for the comparative is in (10).)

(10) $[[\text{er}]] = \lambda P_{\langle d,t \rangle}.\lambda Q_{\langle d,t \rangle}.Max(Q) \geq Max(P)$

The structure we are assuming for comparatives, in (11) goes back to Bresnan (1973). Both the matrix and the *than* constituents are clauses, but material in the *than* clause may be elided under identity with the main clause.

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[3]A minimally different alternative would be to take the comparative operator to compare two degrees and have MAX as a separate operator in the tree.

(11)
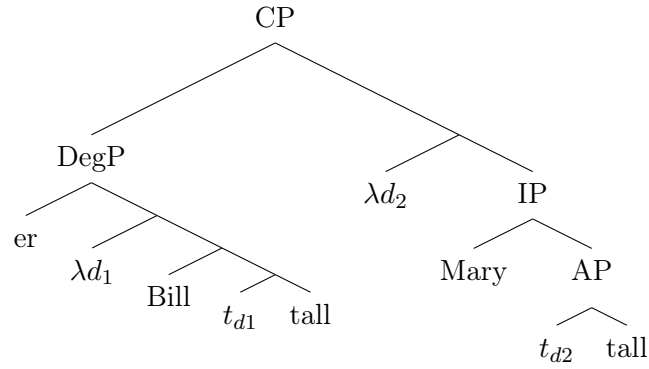
The DegP headed by *er* with the *than* clause as its complement moves out of its base position in the matrix clause AP. In the than clause, a silent wh-operator moves out of the degree argument position of the adjective. Abstraction over these two traces gives us the two sets which serve as input to the comparative operator.

Clausal and Phrasal Comparatives

The account described above from Heim (2001) assumes a clausal analysis of than constituents, i.e. that the standard expression is a reduced clause in which the verb and gradable adjective are elided under identity with those in the matrix clause. Such an account seems necessary from English in order to capture sentences like (12):

(12)   Mary is taller than Sue is.
        Mary is wider than Sue is tall.

What is not so clear is whether there is a second type of comparative construction which directly compares the two individuals. The lexical entry for a comparative operator in such construction from (Heim 1985) is given in (13).

(13) $[[er_{phrasal}]] = \lambda x.\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda y.$ Max({d: P(d)(y)}) > Max({d: P(d)(x)})

(14)
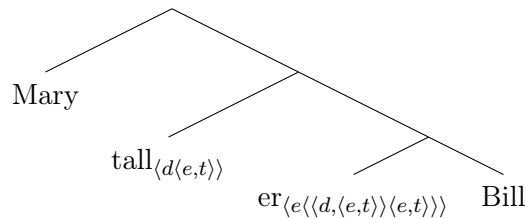
Lechner (2001) Lechner (2004) and Bhatt and Takahashi (2007) Bhatt and Takahashi (2011) have argued against the existence of a phrasal comparative in English based on data from binding and the majority of current analyses for English comparatives are clausal. However, proponents of the phrasal comparative in English still exist (e.g. Hofstetter 2009). We will put the debate about English aside, as it seems clear that this is a point of potential cross-linguistic variation.

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Bhatt and Takahashi (2007) argue, for example, that Hindi has a phrasal comparative construction, as does Pancheva (2006) for a number of Slavic languages. We will return to this question when we discuss cross-linguistic variation in comparison constructions.

Scope in the comparative

A well known problem with Heim (2001)'s account is that it overgenerates. Since there is no theory internal restriction on the relative scope of the DegP and other quantifiers (e.g. Modals, DP-Quantifiers), this theory predicts sentences like (15-a) and (15-b) to ambiguous although they are not judged by native speakers to be so.

(15)   a.   Mary is taller than every student in her class.
        b.   Mary is taller than allowed.

To deal with these cases, Heim (2001) needs to stipulate that DP quantifiers in than clauses always outscope the DP. She has nothing to say about (15-b). Subsequent proposals to Heim (2001) shift from comparatives which take degrees as input, to ones which take intervals Schwarzchild and Wilkinson (2002) or where intervals are calculated and reduced back to points Heim (2006), Gajewski (2008) Beck (2010). However, Schwarzchild and Wilkinson (2002) leaves some unanswered questions with respect to N.P.I licensing and predicts the wrong scope for comparatives which apparently take narrow scope (like the modal *should*) and Heim (2006) and Gajewski (2008) face the problem of overgeneration. We will not attempt to tackle the question of scope in than-clauses for the Yoruba data, so for our purposes the "standard" account will do fine.

1.2.3 The Comparative (Extended)

In section 1.1, we promised to discuss a number of constructions which show, as argued for example by von Stechow (1984a,b), that degrees are necessary to capture the range of possible comparison constructions and that an analysis like that of Klein (1980) falls short in this respect. This is what we will do next. We will start by extending the previous analysis to comparisons with a differential degree, then briefly discuss subcomparatives, and equatives.

Differentials

Von Stechow (1984b) notes that the ability to generate the correct meaning for differential comparatives, like (16) is a touchstone for any semantic theory of the comparative.

(16)   John is three feet taller than Sarah.

As von Stechow points out, to extend an analysis like Klein's to these cases would not be

easy, as it makes an existential claim about whether or not John and Sarah are tall is a given context, without referring to their heights. Under a degree approach, on the other hand, it is relatively easy to extend the basic analysis to account for these cases. We present the proposal spelled out inBeck (2011)'s handbook article on the comparative. According to this analysis, the comparative has a third argument of type $\langle d \rangle$ which is filled by the degree expressed by the differential. The revised lexical entry for the differential is then (17)

(17)   [[er]] $= \lambda d.\lambda P_{\langle d,t \rangle}.\lambda Q_{\langle d,t \rangle}.$ Max({ d':Q(d') =T }) $\geq$ Max({ d':P(d') =T }) +d

In cases where there is no specified difference degree, the degree argument is existentially quantified over, yielding the same truth conditions as the comparative operator from the previous section. The two trees below show the LFs for a comparative with a difference degree (a) and without a difference degree (b).

(A) Logical Form for a Comparative with a Differential
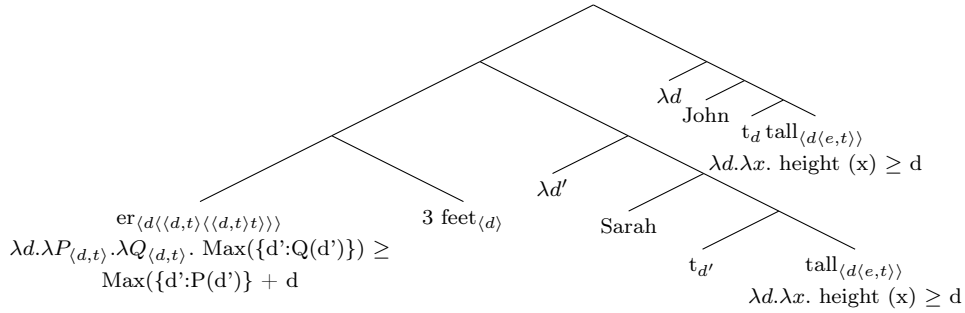
(B) Logical Form for a Comparative without a Differential
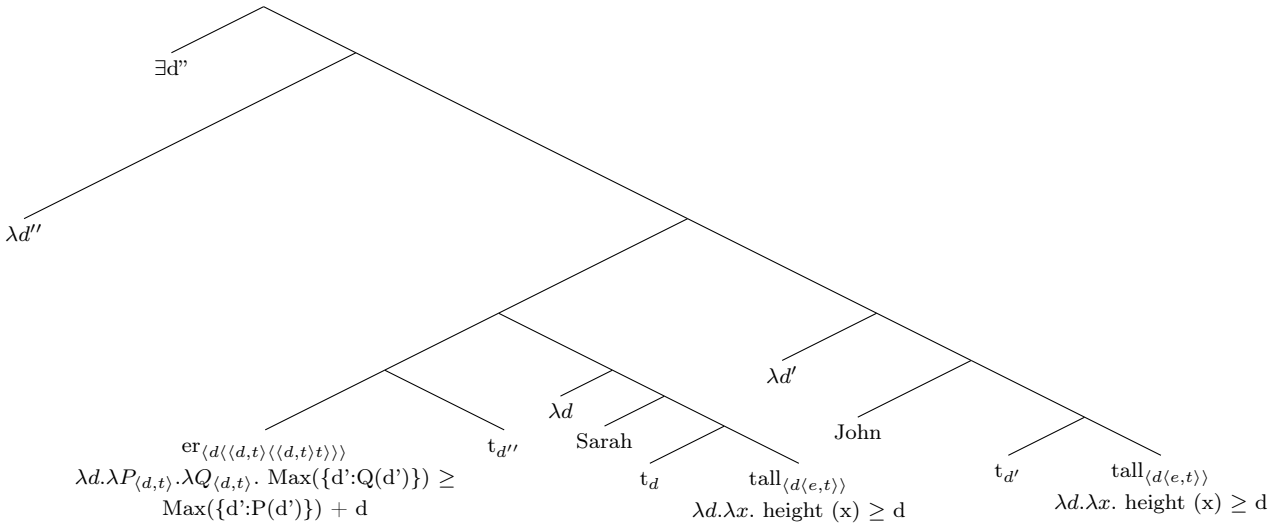
Subcomparatives

Subcomparatives, like (18), constitute further evidence for the degree-based camp. The com-

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paree and the standard NPs are compared with respect to different (comensurable) properties. Comensurable properties are gradable properties which can be measured with the same scale, like width and length for example.

(18)   The moat is wider than the drawbridge is long.

Extending the clausal account outlined in 1.2.2 to subcomparatives is relatively straightforward, since all we need to do is use the overt gradable adjective in the *than* clause rather than assuming that it is elided under identity with the main clause adjective. As von Stechow (1984) points out, this sort of construction becomes a problem for a Klein style analysis. Consider von Stechow's example in (19).

(19)   Ede is wider than he is tall.

Under an analysis where gradable adjectives are of type $\langle e, t \rangle$ and the comparative operator is of type $\langle e \langle e, t \rangle \rangle$, the sentence above would be comparing Ede to himself, and could not capture that we are comparing the degree to which he has two different properties, namely the property of being tall and being wide.

Equatives

Equatives like (20) differ from regular comparatives in that, rather than expressing a strictly greater than relation, they express a greater than or equal to relations[4]. The lexical entry we are assuming for equatives is given in (21).

(20)   John is as tall as Mary.

(21) $[[\text{as...as}]] = \lambda P_{\langle d,t \rangle}.\lambda Q_{\langle d,t \rangle}.Max(\{d : Q(d) = T\}) \geq Max(\{d : P(d) = T\})$

Rett (2010) argues that this view of English *as...as* constructions is probably too simplistic, since unexpected *at most* readings occur in constructions with measure phrases (e.g. *as high as five feet*) and since it raises questions about negative antonyms. We will not discuss these, since in Yoruba the equative construction is quite different from the *as..as* construction in English.

1.2.4 Measure Phrase Constructions and Degree Questions

Measure Phrase Constructions

At the beginning of section 1.2, we assumed that measure phrase constructions like *five feet* were of type $\langle d \rangle$ and that they filled the degree argument slot of the gradable adjective or

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[4]We will take the fact that a sentence like the one above is often taken to mean that John is *exactly* as tall as Mary as an instance of pragmatic strenghthening.

the comparative directly. However, there is reason to believe that measure phrases are, at least sometimes, of a higher type. A d-type analysis is not so easily tenable for more complex measure phrase constructions like *at least/at most/exactly five feet*. For these cases Beck (2011) proposes that measure phrases are generalized degree quantifiers (type $\langle\langle d,t\rangle,t\rangle$). In these cases the measure phrase QRs out of its base position in the head of DegP leaving a $\langle d \rangle$ type trace (See (23)). Under this kind of an account the measure phrases *at most /at least / exactly three feet* would have to have a denotation like the one in (22).

(22) $[[\text{ at least three feet }]] = \lambda P_{\langle d,t\rangle}.Max(\{d : P(d) = t\}) \geq 3feet$

(23)

at least three$_{\langle\langle d,t\rangle t\rangle}$
$\lambda P_{\langle d,t\rangle}.\ Max(\{d:P(d)\}) \geq 3$'

λd

Frodo

t_d tall$_{\langle d\langle e,t\rangle\rangle}$
$\lambda d.\lambda x.\ height\ (x) \geq d$
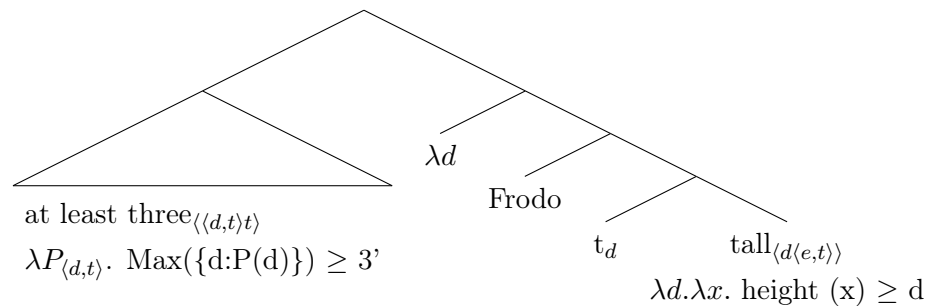
But, at least in some cases, we want to be able to preserve the analysis of measure phrases as degree denoting expressions. Tiemann, Hohaus, and Beck (2010), for example, argue that pronominal measure phrases like the one in (24) are indeed of type d based on evidence from child language acquisition.

(24)   The meeting lasted three hours. I had no idea it would be **that** long.

As we will see in the following section, there is also considerable cross-linguistic variation when it comes to measure phrase constructions and the semantic type a measure phrase can have might be a a point of variation among languages.

Degree Questions

Under one possible analysis, the Logical Form of degree questions remains similar to that of the measure phrase construction in (23). Instead of a measure phrase, which QRs out of the degree argument position of the gradable adjective, a Wh-morpheme moves overtly. Abstraction over the trace left behind creates a property of degrees (type $\langle d,t\rangle$). This property of degrees serves as the input to a wh-morpheme that will yield an appropriate question meaning which, depending on the theory, might be, for example, the set of (true) propositions of the form *that John is d tall'* where d is a degree. The LF in (25) sketches how this might look.

(25)

How
$\lambda P_{\langle d,t \rangle}$. For which d: P(d)=T λd

John

t_d tall

$\lambda d \lambda x.height(x) \geq d$
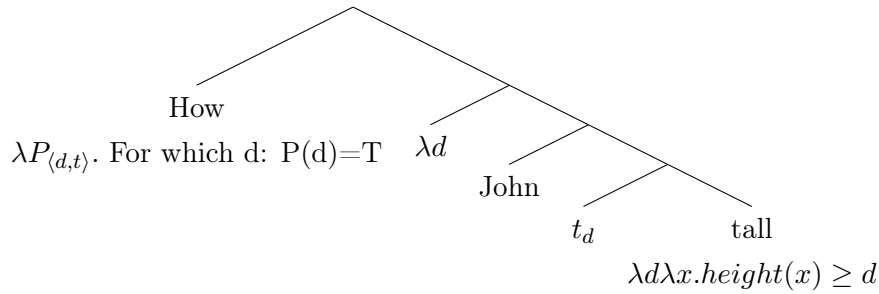
Resulting Truth Conditions: For which d: $height(j) \geq d$

Note that "For which d:" is a notational simplification. We will not go more deeply into the semantics of degree questions here, as question semantics is a very complex topic in its own right. We will take " For which d: $height(j) \geq d$ " to stand for the set of true propositions of the form "P(d) = T" where d is an arbitrary degree.

Now that we have looked at some of the main constructions we will be interested in and how they have been analyzed for English, we will move on to look at Degree Semantics from a cross-linguistic perspective.

1.3 Cross-Linguistic Variation in Degree Constructions

Typological studies of comparison constructions reveal variety in the strategies employed by the world's languages to make comparisons. Stassen (1985) for example distinguishes several different groups of comparison strategies. In addition to what Stassen (1985) calls PARTICLE COMPARATIVES (languages where the comparative is expressed via special degree morphology like English *er/more*) he divides comparison strategies into ADVERBIAL COMPARATIVES (in which comparison is expressed with the help of a directional adverb. He divides this class into separative comparatives, allative comparatives and locative comparatives.), EXCEED COMPARATIVES (in which the comparison is expressed by a verb with the comparee as its subject and the standard as its direct object) and CONJUNCTIVE COMPARISONS (which take the form of an assertion that the comparee has a gradable property, whereas the standard does not or has its negative antonym). Some examples from Stassen (1985) are given below:

(26)   PARTICLE COMPARATIVE (English)
         Peter is taller than Bill.

         ADVERBIAL COMPARATIVE (Massai)
         Sapuk ol -kondi to l -kibulekeny
         is-big the -deer to the -waterbuck
         "The deer is bigger than the waterbuck."

EXCEED COMPARATIVE (Yoruba)

O tobi ju e

He big exceed him

"He is bigger than him."

THE CONJOINED COMPARATIVE (Hixkaryana)

Kaw-ohra naha Waraka, kaw naha Kaywerye

tall-not he-is Waraka tall he-is Kaywerye

"Kaywerye is taller than Waraka"

An important question for semanticists is whether this outward diversity is reflected in the semantics Chris Kennedy (2009). A large scale typological study in the style of Stassen (1985) cannot possibly hope to provide a detailed semantic analysis for all languages in their sample (Stassen's typology includes over 100 langaugages), so to answer this question semanticists have instead looked at much smaller samples, often contrasting only one or two languages. A notable exception is the study by Beck et al. (2011) which provided a detailed semantic analysis of comparison construction in 17 different languages based on a common questionnaire carried out for all 17 languages. This section discusses some relevant previous work on cross-linguistic variation in degree constructions. It is not meant to be a comprehensive review and we will focus heavily on the semantics of the comparative. We start by introducing Beck et al (2011), which, both in terms of the Yoruba data and in terms of analysis was the starting point for the research in this thesis. We then look at two papers by Bhatt and Takahashi (2007, 2011) which discuss variation in the semantics of the comparative operator. Finally, we look at a proposal by Kennedy (2009) which also looks at differences in the semantics of comparison, but has a slightly different take on some of the same data discussed by Beck et al. and Bhatt and Takahashi.

1.3.1 Beck et al. (2011)

Beck et al. (2011) proposed three parameters for cross-linguistic variation which aim to explain the results of a questionnaire study they carried out in parallel in 17 languages chosen from different languages families. In addition to eliciting simple comparatives they also tested whether the languages in their sample had other degree constructions like Measure Phrase Constructions, Subcomparatives, Differentials, Superlatives, Degree Questions and whether scope in comparatives behaves in the same way it does for English. They found that the presence of various different degree constructions in a given language is correlated, as Table 1 illustrates.[5]

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[5]The abbreviations DiffC, CompDeg, Scope, NegIs, DegQ, MP and SubC stand for Differential Comparative, Comparison with a Degree, Scope Interactions in Comparatives, Direct Measure Phrase Constructions and Subcomparatives respectively. When n/a appears in the table, it means that the construction in question is ungrammatical for independent reasons. (For example in Turkish Negative Islands and Subcomparatives are n/a because they require a clausal comparative construction which Turkish lacks). When no appears in

Table 1.1: Results from B17 Questionnaire (Beck et al. 2011)

Language	DiffC	CompDeg	Scope	NegIs	DegQ	MP	SubC
English	yes	yes	yes	yes	yes	yes	yes
German	yes	yes	yes	yes	yes	yes	yes
Thai	yes	yes	yes	yes	yes	yes	yes
Romanian	yes	yes	yes	yes	(no)	(no)	(no)
Spanish	yes	yes	yes	yes	(no)	(no)	(no)
Guarani	yes	yes	yes	yes	no	no	no
Russian	yes	yes	yes	yes	no	no	no
Turkish	yes	yes	yes	n/a	no	no	n/a
Chinese	yes	yes	no	no	no	no	no
Japanese	yes	%	no	no	no	no	no
Mooré	yes	yes	no	n/a	no	no	n/a
Yoruba	yes	yes	no	n/a	no	no	n/a
Motu	no	no	n/a	n/a	no	no	n/a

To explain this pattern they propose three parameters along which languages can vary: The Degree Semantics Parameter (DSP), the Degree Abstraction Parameter (DAP) and the Degree Phrase Parameter (DegPP). We will look at each parameter in turn.

The Degree Semantics Parameter

The Degree Semantics Parameter (DSP) give in (27) is concerned with whether or not a language has degrees as part of their ontology.

(27)   DEGREE PHRASE PARAMETER
        A language does/does not have a gradable predicate (type $\langle d, \langle e, t \rangle \rangle$ and related.) i.e. a
        lexical item which introduces a degree argument.
        (Beck et al. 2011)

Languages with a -DSP setting are predicted to lack expression which potentially manipulate degress (such as a comparative, superlate or equative operator) as well as expressions potentially referreing to degrees (such as measure phrase constructions). As we saw in Section 1.2, a degree-less account, like that of Klein (1980) can capture simple comparatives, but cannot account for Differential Comparatives or Subcomparatives, so in -DSP languages we expect not to find such constructions. The only language in Beck et al's sample which fits these criteria is Motu (an Austronesian language spoken in Papua New Guinea).

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brackets it means that the language has a rescue strategy to save the construction in question.

The Degree Abstraction Parameter

The Degree Abstraction Parameter (DAP) in (28) is concerned with whether or not a language has abstraction over degrees. This parameter was first proposed in Beck, Oda and Sugisaki (2004) to explain a number of differences between comparatives in English and Japanese.

(28)   THE DEGREE ABSTRACTION PARAMETER A language does/does not have binding of
         degree variables in the Syntax.
         (Beck, Oda, Sugisaki 2004)

Beck, Oda, and Sugisaki (2004) note a number of differences between comparison constructions in English and Japanese: While in English sentences like the one below are ambiguous, the Japanese equivalents do not present the same ambiguity. What's more, while comparatives in English show negative island effects, this is not the case for Japanese.

(29)   a.   The draft is five pages long. The paper needs to be exactly five pages longer than
               that.
         b.   *Sono sitagaki-wa 10 peeji desu. Sono ronbun-wan sore   yori(mo)*
               That draft-Top   10 pages COP.   That   paper-top that
               tyoodo   5   peeji nagaku-nakerebanaranai.
               YORI(MO) exactly 5   page   long-be-required.
               "The paper is required to be exactly 5 pp longer than that. "
         c.   *John bought a more expensive book than nobody did.
         d.   *John-wa dare-mo kawa-naka-tta no yori   takai   hon-o   katta.*
               John-Top anyone   buy-Neg-Past No YORI expensive book-Acc bought.
               "John bought a more expensive book than the book that nobody bought."

Japanese also lacks a number of degree constructions which are present in English such as Degree Questions, Measure Phrase Constructions and Subcomparatives. They note that these constructions all require abstraction over the degree argument of the gradable adjective and thus propose the DAP as a parameter to distinguish languages like Japanese (-DAP) from languages like English (+DAP). Beck et al.'s study concludes that Chinese, Mooré, Samoan and Yoruba also belong to the class of +DSP -DAP languages. (Motu and other -DSP languages, by virtue of the fact that they do not have degrees as part of their ontology are automatically -DAP.)

The Degree Phrase Parameter

The DegPP, given in (30) is concerned with how the degree argument of a gradable predicate is filled.

(30)   THE DEGREE PHRASE PARAMETER The degree argument of a gradable predicate
        may/may not be overtly filled.
        (Beck et al. 2011)

For a language to be +DegPP it must first have degrees as part of its ontology (+DSP). Al-
though Beck et al. (2011) originally proposed that for a language to be +DegPP it must also
be +DAP,Tiemann, Hohaus, and Beck (2010) argue, based on data from Mandarin that the
DegPP and the DAP are actually independent of one another. Constructions which distinguish
-DegPP languages from +DegPP languages are Measure Phrase Constructions which, at least
under some analyses, overtly fill the degree argument position of the gradable adjective, Sub-
comparatives, and Degree Questions. The languages in Beck et al.'s study found to be -DegPP
are Russian, Turkish, Romanian, Spanish and Guarani.

Beck et al. propose that these three parameters explain differences in degree constructions
found in different languages as well as providing an explanation for the correlations between
presence/absence of various constructions illustrated by Table 1. The next line of research we
will look at has a somewhat different focus. Bhatt and Takahashi (2007) and (2011), rather than
looking at interpretational mechanisms central to all degree constructions, such as the presence
of an ontological entity or conditions on interpretational mechanisms like λ-abstraction, look
instead at a single lexical item: the comparative operator. Using data from Hindi English
and Japanese, they motivate differing accounts of the comparative operator in each language,
influenced by independent syntactic properties of the language.

1.3.2 Bhatt and Takahashi (2007, 2011)

Bhatt and Takahashi (2007, 2011) examine phrasal comparatives in Hindi and English and show
that, while in English phrasal comparatives are derived from clausal source, in Hindi they are
usually computed directly with a 3- place comparative operator with a similar lexical entry to
the 3-place operator from Heim (1985) presented in 2.2. Bhatt and Takahashi (2007) provide
data from binding, from a restriction on the number of remnants (only one remnant is allowed in
Hindi comparatives, whereas multiple remnants are possible in English) and on different scope
patters (in Hindi, a quantifier must take wider scope if the QP does not c-commands the site
of degree abstraction while this is not the case for English). They claim that in Hindi, finite
clauses cannot be combined with -se, the postposition marking the *than*-constituent, causing
ungrammaticality for clausal comparatives. They argue that this is what motivates the need for
a 3-place comparative operator. They propose that the 2-place comparison operator (necessary
in Hindi for comparatives with correlatives and for comparison with a degree) comes for free in
all languages, as it is a basic quantifier meaning. Only when there are independent reasons for
the unavailability of the 2-place comparative (as in Hindi phrasal comparatives) is the 3-place

operator available. In a more recent paper, Bhatt and Takahashi (2011) refine their proposal with the help of data from Japanese. They propose that whether or not a 2-place or 3-place degree head is used depends entirely on the syntactic configuration of comparatives in the language and that, although these are two distinct degree heads, they are two different realizations of the same comparative meaning.

However, Bhatt and Takahashi's three place comparative is not the only imaginable three place operator. In a paper on the time course of the acquisiton of comparatives, Tiemann, Hohaus and Beck (2010) propose that Child English does have a three place operator. Their operator differs from the one proposed by Bhatt and Takahashi in the order of its arguments. While the former combines first with the *than* constituent and then with the gradable predicate, the latter does the opposite. The lexical entry for Tiemann, Hohaus and Beck's *-er* is in (31).

(31) $\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda x.\lambda y.Max(\{d : P(d)(y)\}) > Max(\{d : P(d)(x)\})$

The two lexical entries differ only subtly, but this makes a difference with respect to whether the comparative is mobile at LF. In the first case, the comparative and *than*-constituent can move out of their base position while in the second they can only be interpreted in-situ. We will see later that this distinction becomes important for the Yoruba data.

1.3.3 Kennedy (2009)

(Chris Kennedy 2009) covers some of the same theoretical and empirical ground as Beck et al. (2011) and Bhatt and Takahashi (2007, 2011). Like them, Kennedy is interested in determining the semantic differences at the heart of observed cross-linguistic variation in the structure and behavior of comparison constructions. He re-examines the data presented in Beck, Oda and Sugisaki (2004) and proposes that a more accurate way to characterize the difference between the two languages (e.g. lack of negative island effect and scope ambiguities, variable acceptability of attributive comparatives, lack of subcomparatives in Japanese) is in terms of what he calls "individual" versus "degree" comparison. He proposes that in English complex standards can be of type $\langle d\rangle$ whereas in Japanese, complex standard expressions are of type $\langle e\rangle$. Like Beck, Oda and Sugisaki (2004), he takes the *yori* (than)-constituent to be a individual denoting relative clause. This distinction has a similar flavour to Bhatt and Takahashi's two place/three place distinction, and would presumably cover much of the same empirical data.

Kennedy proposes that a second dimension along which languages can vary is whether they have "implicit" or "explicit" comparatives. Implicit comparatives "establish an ordering between objects x and y with respect to gradable property g using the positive form by manipulating the context in such a way that the positive form true of x and false of y" while explicit comparatives "establish an ordering between objects x and y with respect to gradable property g using a mor-

phosyntactic form whose conventional meaning has the consequence that the degree to which x is g exceeds the degree to which y is g". (Kennedy 2009, p 16). Although it is stated differently, this distinction shares a common core idea with Beck et al (2011)'s DSP, which also dictates whether a language has recourse to an explicit mode of comparison. The two also cover similar empirical ground when it comes to comparison constructions (availability of differential measure phrases, presence of degree morphology...). The main difference between Kennedy's distinction and the DSP is that while the former only extends its reach to comparison constructions, the DSP also makes predictions about the availability of other degree constructions like direct measure phrase constructions and degree questions.

In this chapter, we have given a brief introduction to degree semantics, discussed the "standard" analysis for a number of English degree constructions and then broached the question of cross-linguistic variation in this area. We have seen three different approaches to cross-linguistic variation in the comparative. Armed with this introduction, we will now move to the main task of this work: analysing degree constructions in Yoruba and determining what insight they can contribute to the question of cross-linguistic variation in the comparative.

2 Degree Semantics in Yoruba

2.1 An overview of Yoruba Grammar

This section gives a brief overview of Yoruba grammar. The aim is to provide the background information which will be necessary for our analysis of comparatives. Yoruba is a language in the West-Benue-Congo branch of the Niger Congo language family. It is spoken by approximately 25 million speakers worldwide, most of them in Nigeria and Benin.
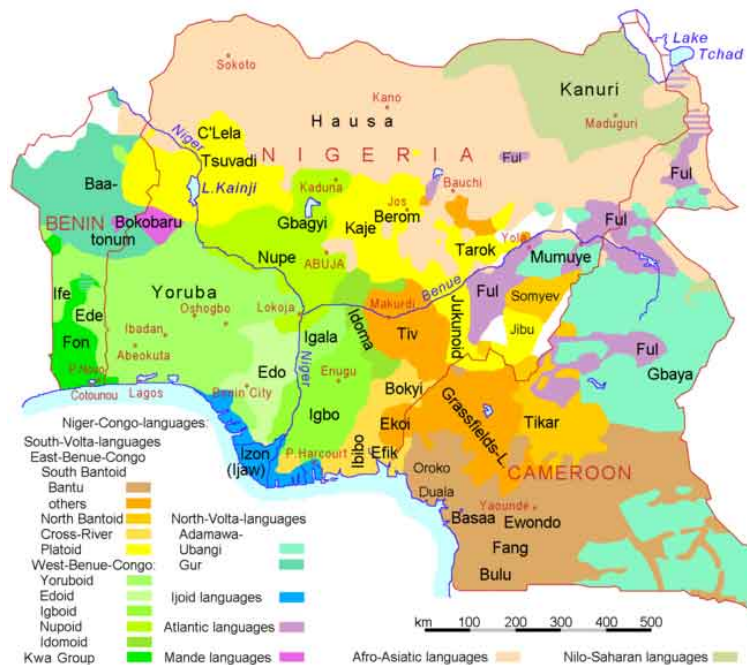
Figure 1: Spatial Distribution of Niger-Congo Languages
(Image Source: http://de.wikipedia.org/wiki/Niger-Kongo-Sprachen)

Like many of the Niger-Congo languages, Yoruba is a tone language and its basic word order is SVO. There are a number of different dialects spoken within the Yoruba speaking area of Nigera, Benin and Togo. The Oyo dialect is considered standard Yoruba and used for communication among people from different dialects and in formal settings (much like "Hochdeutsch" for German speakers). This is the dialect we will be concerned with in this work. [1]

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[1] My informants each speak a different dialect, though they all also speak the standard Oyo. The dialects spoken

In what follows, I will use the standard orthography for Yoruba. It is composed of the letters of the latin alphabet (with the exception of c, q, v, x and z, which are not used) corresponding, more or less, to their IPA counterparts, as well as several additional characters: ẹ (/ɛ/), ọ (/ɔ/), ṣ (/ʃ/), gb (/g͡b/) . The letter "p" is not a voiceless bilabial stop, but rather(/p͡k/). Yoruba has three tones: High, Low and Mid. The high tone is marked with a (´) and the low tone with an (`). Mid tones are left unmarked.

Yoruba has received significant attention from linguists and a substantial background literature on Yoruba exists, which is too extensive to discuss thoroughly here. Perhaps the most frequently cited reference grammar of Yoruba is Bamgbose (1966). I used this work extensively in forming background assumptions about grammar of Yoruba. Bamgbose's grammar was complemented with descriptions from earlier dictionaries and grammars ((Bowen 1858), (Ward 1952), (Abraham 1958), as well as several textbooks for Yoruba learners ((Rowlands 1969), (Schleicher 2008)). In addition, many journal articles and dissertations covering various aspects of Yoruba syntax and semantics were helpful in providing information on specific topics. In particular three dissertations in the framework of generative grammar ((Adesola 2005), (Ajiboye 2005) and (Bode 2000)) and grammar sketches therein were helpful in providing information about clause structure and determiner systems. Discussion of comparatives and degree constructions can be found in (Beck et al. 2011). A more extensive discussion is found in (Vanderelst 2010) whose primary focus is evaluativity. Besides these two works, I am not aware of any other discussion of Yoruba degree constructions in the literature.

In addition to data from grammars and articles on Yoruba, the analysis presented in this chapter was developed based on fieldwork carried out by the author with five Yoruba native speakers in Germany. The data was gathered using the techniques and guidelines for semantic fieldwork from Matthewson (2004). Unless otherwise specified, the Yoruba examples in the rest of this work are from this fieldwork.

We will now look briefly at a few aspects of Yoruba grammar which will be useful for our discussion of degree constructions: We deal first with word order in sentences, then within DPs (looking briefly at quantifiers). We then move on to inflexion in Yoruba, including case, number, tense and aspect marking. We then look in some more detail at a particular type of construction, the Serial Verb Construction (SVC), which is relevant for our purposes because comparison constructions in Yoruba are SVCs.

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by my informants are: Ekiti, Ilesha, Ogun and Oyo. Informants stressed that their responses to questionnaires were for standard Yoruba rather than their native dialect, however, this might be a source of variation between speakers.

2.1.1 Word Order

Basic word order in Yoruba is SVO. As there is no overt case marking on nouns, it has been suggested that the strict word order in Yoruba plays an important rule in determining argument structure. Akinlabi (2001).

(32) *Olu rí Ade.*
      Olu see Ade
      "Olu saw Ade."
      (Akinlabi, 2001)

More generally, Yoruba phrases appear to be head initial in the majority of cases. CP, TP (IP), PPs and VPs all display head initial word order, see Table 2. DPs are an apparent exception to this generalization. While certain DPs exhibit head initial word order (33-a), in others the determiner follows the noun (33-b) (Ajiboye 2005). However, the status of these head final determiners has been called into question by some linguists. Manfredi (1992) and Ajiboye (2005) argue that, although the lexical items *nàá* and *kan* are frequently translated with *the* and *a* respectively, they are syntactically and semantically different from them. Both Manfredi and Ajiboye treat these as nominal modifiers rather than determiners. Bare nouns are common in Yoruba and a bare noun can receive a definite or indefinite interpretation based on the context without the presence of *nàá* or *kan*, as (34) illustrates.

Table 2.1: Word Order in Yoruba (Ajiboye 2005)

VP	PP	IP	CP
je isu	*sí Fánkúfa*	*yóò je isu*	*pé mo je isu*
eat yam	in Vancouver	will eat yam	that I eat yam

(33) a. *gbogbo ọmọ*
        all   child
        "all of the children"

     b. *ọmọ yìí*
        child this
        "this child"
        (Ajiboye 2005, p.9)

(34) a. *Tàkúté Olú mú òyá.*
        trap   Olu hold grass-cutter
        "Olu caught a grass-cutter"

     b. *Olú gbé òyà lolé.*
        "Olu carry grass-cutter go.home"
        Olu carried the grass-cutter home.

(Ajiboye, 2005)

This observation is interesting for our discussion of degree constructions because, as we will see in the coming chapters, the apparently limited use of true DP quantifiers seems to be mirrored by a limited used of degree quantifiers, for example measure phrases of quantificational type. We will not make any claims about the relationship between these two phenomena in this work, but we hope to pursue it in further research.

2.1.2 Inflection

This paragraph covers a variety of inflexional morphology in Yoruba. Due to space concerns, the diverse topics of Case, Number, Tense and Aspect marking will be covered together here. We will first deal with marking on nouns, then turn to verbs.

On nouns

Nouns in Yoruba are not marked for gender or case (Bamgbose 1966), although pronouns, which come in a strong and weak variety do differentiate between nominative and accusative case. [2] Plurality is marked by the particles *awǫn* (strong) and *wǫn* (weak) before the noun, as in (35-a), but plurality can also be contextually determined in the absence of a plural marker, as in (35-b) (Adesola 2005).

(35) a. *Mo   kí   àwǫn ǫkùnrin.*
          1.SG.NOM greet PL   man
          "I greeted men."

      b. *Mojí rí ejò   lǫna   oko*
          Mojí see snake on.path farm
          "Moji saw snakes/a snake on her way to the farm"
          (Adesola 2005)

On verbs

Verbs do not inflect for number or person in Yoruba. Tense and aspect is marked by the presence of a pre-verbal particle. A distinction is made between future and non-future (past and present). Future tense is marked by the particles *màá* or *yóò*, while past and present tense are unmarked (Bamgbose 1966). It has been proposed (Awobuluyi (1978)) that the phonological process by which a final low or mid tone of a subject becomes high before a verb (known as High Tone Junction) is actually non-future tense marking, because it does not co-occur with future tense marking. In addition to tense, a number of pre-verbal aspect markers can also appear before a verb. Table 3 lists the most common tense and aspect particles. Although tense and aspect

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[2]For a thorough treatment of pronouns in Yoruba see Adesola (2005).

particles will not play an important part in our analysis of degree constructions, they are an important tool for diagnosing serial verb constructions, as we will see in the next paragraph, and as such provide evidence in favour of analysing comparative and equatives in Yoruba as serial verb constructions.

Table 2.2: Tense and Aspect Particle in Yoruba (Adesola 2005)

Particle	Aspect/ Tense
máa n	habitual
ti	perfective
n	progressive
máa	durative
yóò/máa	future
high tone on final syllable of subject	non-future

2.1.3 Serial Verb Constructions

Serial Verb Constructions (SVCs) are used frequently in Yoruba. Aikhenvald and Dixon (2006) define SVCs as follows: " A serial verb construction is a sequence of verbs which act together as a single predicate without any overt marker of co-ordination, subordination or syntactic dependency of any other sort." (p. 1). As the verbs in a SVC function syntactically and semantically as a single predicate, there are a number of tests which can determine SVC-hood. In a serial verb sequence, tense and aspect marking can only appear once (though it may be marked concordantly). Negation and processes like nominalization and relativization can only apply to all the verbs in a serial verb sequence. In Yoruba, all verbs in a serial verb construction can (and must) be moved together, for example when being fronted in a cleft construction (Baker 1989).

(36)   a.   *Bola sè   ẹran tà*
            Bola cook meat sell
            "Bola cooked and sold the meat."

       b.   *Sí-ṣe-tà   ni   Bola sè   ẹran tà.*
            Redupl-cook-sell Bola cook meat sell
            "Bola COOKED AND SOLD the meat."

            (Capitals indicate focused constituent.) (Baker 1989)

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2.2 Yoruba Degree Constructions

Now that we have gone over some of the basics about Yoruba Grammar, we can move on to degree constructions.We will start by looking at the semantics of gradable property words and then move on to comparative and equative constructions.

2.2.1 Gradable Property Words in Yoruba

The first thing which sets Yoruba apart from more familiar languages like English and German is that Yoruba has two kinds of words to express gradable properties. The first, which we will refer to as gradable verbs are state verbs and can only be used predicativly (37). The second, which we call gradable adjectives can only be used attributively and are derived from the gradable verb by reduplication (38).

(37) a. *Olu sanra.*
          Olu be.fat
          "Olu is fat."

      b. **Olu je ọmọ sanra.*
          Olu be child be.fat

(38) a. *Olu je ọmọ sísanra.*
          Olu be child fat
          "Olu is a fat child."

      b. **Olu sísanra.*
          Olu fat
          Consultant's comment: "This means 'fat Olu.' For example you could say this if there were two Olus and you were talking about the fat one. This is not a full sentence."[3]

The reduplication pattern which derives the adjectival form from the verb is common in Yoruba verbs outside the domain of gradable adjectives, as illustrated in (39-a) below. In the case of regluar action verbs, the product of reduplication is a noun with the meaning "the act of VERB-ing ", or "the fact that VERB took place". It is also frequently used in cleft constructions to express focus. An interesting project for further research would be to attempt to provide a unified semantics for reduplication in Yoruba, but we will not do so here. Instead, we will consider only its function with gradable predicates.

(39) a. *já,   jíjá*
          to.fight, the.act.of.fighting

      b. *ga,   gíga*
          be.tall, tallness/tall
          (Bode, 2000)

---

[3]Adjectives follow the noun they modify in Yoruba.

We will next look at each type of gradable property word in turn. For each, we will motivate our assumption about the lexical category to which we claim it belongs and then discuss its semantics. We will argue that the gradable verb has the same basic meaning as gradable adjectives in English and that the gradable adjective is a vague predicate of type $\langle e, t \rangle$.

Gradable Verbs

Although these have sometimes been called adjectives (Afolayan 1972), they pattern phonologically and morphologcially with verbs: They are always consonant initial (Yoruba verbs never begin with a vowel), they trigger what is known in the literature as a "high tone junction "(a low or mid tone raises to a high tone before a vowel), they can undergo reduplication and can be marked for tense and aspect (Bamgbose 1966). Syntactic evidence also supports their status as verbs: they can be part of a serial verb construction and cannot be used attributively. Despite syntactic differences, we propose that the semantics of Yoruba gradable verbs does not differ substantially from that of English gradable adjectives. They are used together with degree operators in many different kinds of degree constructions such as the comparative (including differential comparatives) (40-a), equatives (40-b), degree questions (40-c) and measure phrase constructions (40-d).

(40)   a.   *O   ga   ni   esebata kan ju   mi   lọ*
           3SG.NOM be.tall PREP foot   one exceed *1sg.acc* GO
           "He is one foot taller than me. "

    b.   *O   ga   tó   mi.*
           3SG.NOM be.tall reach 1SG.ACC
           "He is as tall as me."

    c.   *Bawo l'   Ade ṣe ga   tó?*
           How   FOC Ade Q be.tall reach
           "How tall is Ade?"

    d.   *Ade ga   ni   esebata marun.*
           Ade be.tall PREP foot   five
           "Ade is five feet tall."

From this, we conclude that gradable predicates in Yoruba must have a degree argument which can be manipulated by these degree operators. Following the standard theory, we take Yoruba gradable verbs to have a monotonic semantics. The lexical entry that we propose for Yoruba gradable verbs, given in (41) is identical to the one we suggested for English gradable adjectives in Chapter One.

(41)   [[gradable verb]] $= \lambda d.\lambda x.$ Meas(x) $\geq$ d
        (Where Meas is a measure function determined by the particular gradable verb.)

Gradable adjectives appear to differ from gradable verbs not just in category, but also in their semantics. We will look at these next.

Gradable Adjectives

Some of the early grammars e.g. (Bowen 1858) consider these to be nouns, on the grounds that the product of reduplication with other verbs is generally a nominalization. However, Yoruba scholars have brought forward evidence for treating it as an adjective. As Bode (2000) notes, these lexical items cannot be used in isolation as arguments of a verb and must always be accompanied by a noun which they modify. Based on this syntactic evidence, most scholars agree to call these adjectives. They are far more restricted in their use than their verbal counterparts. For example, in translation tasks, consultants generally offered a relative clause with the verbal form when asked to translate an attributive adjective, as in (42). But, however infrequent, gradable adjectives are grammatical in the positive when used attributively, as in (38). In degree constructions, on the other hand, gradable adjectives are uniformly bad. Informants rejected gradable adjectives in comparatives (43-a), equatives (43-b), degree questions (43-c) and measure phrase constructions (43-d).[4]

(42)   *Mo*   *ra* *ìwé* *to*   *wòn.*
       1.sg.nom buy book REL-3.SG.NOM be.expensive
       "I bought an expensive book."

(43)   a. **Olu jé okùnrin sísanra ju*   *bàbá* *rè* *lọ* .
          Olu be man   fat   exceed father his GO
          Intended: "Olu is a fatter man than his father."

       b. **Olu jé okunrin sísanra tó*   *bàbá* *rè.*
          Olu be man   fat   reach father his
          Intended: "Olu is as fat a man as his father."

       c. **Bawo Olu jé okùnrin gíga tó?*
          How Olu be man   Q   tall reach
          "How tall a man is Olu?"

       d. ?*Olu jé okùnrin gíga ní*   *(iwon)* *esebata marun*
          Olu be man   tall PREP measure foot   five
          "Olu is a five foot tall man."

We propose to account for this ungrammaticality by analysing the gradable adjectives as vague predicates (of type $\langle e, t \rangle$). Their meaning can be derived from assuming that the reduplication contributes a POS operator, so that the lexical entry of the reduplicated word is as follows:

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[4]Measure Phrase Constructions were a point of variation among informants. It is possible that in measure phrase constructions with *ni iwon*, which informants translated as "in measure", the measure phrase is not an argument of the gradable adjective, but of *iwon*, measure.

(44) $[[$ gradable adjective$]]^c = \lambda x.\ \mathrm{Meas}(x) \geq d_c$
         (Where d_c is a contextually determined standard.)

The presence of a lexicalized POS predicts that constructions with gradable adjectives in Yoruba are always norm related. Technically, this prediction proves hard to test, because of the limited use of this form. Beyond the positive construction which is by definition norm related, the gradable adjectives are not grammatical in any other degree constructions where we might test norm-relatedness.

2.2.2 The Comparative (*ju...lọ*) and the Equative (*tó*)

Comparatives

Comparatives in Yoruba are expressed via a serial verb construction made up of the gradable verb and a verb which means roughly "to exceed". The subject of the serial verb is the comparee and the direct object, the standard of comparison. An example is given below. In this example the NP *Jokó yìí* (This chair) is the subject and *ìyén* (Proform,"that one") is the object of the serial verb sequence.

(45)   *Jokó yìí dà   jù   ìyen   lọ* .
        Chair this be.good exceed that.one GO
        This chair is nicer than that one.

Evidence that this construction is an SVC comes from the behaviour of tense/aspect particles, modals and negation in comparatives as well as data from cleft constructions. Recall from the first part of this chapter, that negation, tense and aspect marking and modals could not intervene between two verbs in a serial verb sequence, nor could tense and aspect be marked twice within an SVC. This is also the case in comparatives.

(46)   a. *ọmọ nàá máa yára   ju   Òré rè lọ*
            Child the FUT be.fast exceed friend his GO
            "That child will be faster than his friend."

        b. **ọmọ nàá yára   máa ju   Òré rè lọ* .
            Child the be.fast FUT exceed friend his GO

        c. **ọmọ nàá máa yára   máa ju   òré rè lọ* .
            Child the FUT be.fast FUT exceed friend his GO

(47)   a. *ọmọ yìí kò   ga   ju   òré rè lọ*
            Child this NEG be.tall exceed friend his GO
            "This child is taller than his friend."

        b. **ọmọ yìí ga   kò   jù   òré rè lọ* .
            Child this be.tall NEG exceed friend his GO

The next piece of evidence for analysing *ju...lọ* and the gradable verb as verbs in a serial verb

construction comes from cleft constructions, but before making this argument, some background on Yoruba cleft constructions is necessary. In Yoruba focus can be expressed via a type of cleft construction where the focuses phrase is fronted followed by the particle *ni* (Akinlabi 2001). The following examples shows NP clefts out of the subject (48-b) and object (48-c) positions. In some cases, for example when the clefted NP is moved out of subject position, a resumptive pronoun must be left in its place. Verbs can also be fronted, but they must first be nominalized via reduplication (49).[5]. A copy of the verb is left in the base position. Consultants uniformly rejected sentences in which an entire VP was fronted (50).

(48) a. *Olu pa ẹran.*
          Olu kill animal
          "Olu killed the/an animal."

      b. *Olu ni o pa ẹran.*
          Olu FOC 3.sg.acc kill animal
          "It was Olu that kiled the/an animal."

      c. *ẹran ni Olu pa.*
          Animal FOC Olu kill
          "It was an/the animal that Olu killed."

(49) *Pípa ni Olu pa ẹran.*
      Kill(NOM) FOC Olu kill meat
      "Olu KILLED the animal."

(50) **Pípa ẹran ni Olu pa ẹran.*
      Kill(NOM) animal FOC Olu kill animal
      "It was kill the animal that Olu did."

For our purposes, we also need to know what happens in two special cases of verb fronting: Verb fronting in serial verb constructions and verb fronting with so called "splitting verbs". Yoruba has a number of discontinuous verbs, referred in most grammars as "splitting verbs", which split around the object. We will argue that the comparative *ju...lọ* is a verb of this kind. In cases where these splitting verbs are focused, the entire verb is fronted rather than just one of the segments. As we mentioned already in the section on SVCs, in serial verb constructions, both verbs can (and must) be fronted simultaneously, as in example (36-b). When this happens, only the first verb is reduplicated.

Comparatives behave predictably if we take them to be serial verb constructions (and *ju...lọ* to be a splitting verb): The gradable verb along with *ju* and *lọ* are always fronted together.[6]

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[5]This is the same kind of reduplication which transforms gradable verbs to adjectives which can be used attributively

[6]In some contexts, the gradable verb can be grammatically omitted, when the relevant gradable property is

Reduplication occurs on the first verb of the string, which is the gradable adjective. Not fronting all three results in ungrammaticality.

(51)   a.   *Olat sare   ju   Omotayo lọ* .
              Olat run.fast exceed Omotayo GO
              "Olat ran faster than Omotayo."

        b.   *Sísare-ju-lọ   ni Olat sare   ju   Omotayo lọ* .
              REDUPL-run.fast-exceed-GO FOC Olat run.fast exceed Omotayo GO
              "Olat RAN FASTER than Omotayo."

        c.   **Jíju-lọ   ni Olat sare   ju   Omotayo lọ* .
              REDUPL-exceed-GO FOC Olat ran.fast exceed Omotayo GO.
              Intended: "Omotayo EXCEEDED Olat's speed."

        d.   **Sísare-ju   ni Olat sare   ju   Omotayo lọ* .
              REDUPL-run.fast-exceed FOC Olat run.fast exceed Omotayo GO.
              "Olu RAN faster than Omotayo."

We will follow (Vanderelst 2010) in taking *ju. . . lọ* to be a single lexical item. Although *lọ* is homophonous with the verb *to go*, and claims have been made for other languages linking motion verbs and locative expressions to comparative constructions (e.g. in Hohaus 2009 for Samoan, or see Kennedy 2009), we will assume that it does not contribute semantically to the comparative in Yoruba. We do not comment on whether the two uses of *lọ* may have a common history. The above evidence from movement and reduplication indicates that *ju. . . lọ* behaves as a single word and that *lọ* and the standard expression which it follows do not form a syntactic constituent. What's more, *lọ* cannot be marked for tense, modality and negation as we would expect it to, if it were an independent verb.

(52)   a.   **ọmọ nàá yára   jù   ìyen   máa lọ* .
              Child this be.fast exceed that.one FUT GO.
              Intended: "This child is faster than that one will be."

        b.   **Omotayo yára   jù   Adé le   lọ* .
              Omotayo be.fast exceed Ade can GO.
              Intended: "Omotayo is faster than Ade can be."

One might argue that these data could be explained if *lọ* were a third verb in the serial verb construction along with *ju* and the gradable verb. None of the data presented so far could tease the two possibilities apart empirically, since verbs in serial verb constructions appear to act as a

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clear from the context. This is often done, for example, when comparing age. In these cases, *ju...lọ* can be fronted on its own and *ju* is reduplicated:

(i)   Jijulo   ni Olat ju   Omotayo *lọ*
        redupl-exceed foc Olat exceeed Omotayo go
        "The fact is Olat is older than Omotayo." (Consultant's translation)

single predicate too. More generally, the relationship between "splitting verbs" and serial verb constructions in Yoruba is an interesting question, which merits further investigation. What we can say with certainty is that these data are much more difficult to make sense of if we take *lọ* to form a constituent with the standard. The data from cleft constructions clearly suggests that the *ju...lọ* and the gradable adjective form a syntactic (and probably also semantic) constituent and that the object, or standard expression, is an argument of this constituent, rather than combining first with *ju* or with *lọ*.

In Chapter One, we discussed reduction and direct analyses for the syntax of comparatives. Yoruba comparatives appear to be solely of the latter form. The standard expression can only be a nominal expression, or an internally headed relative clause (which pattern syntactically with nominal expressions in Yoruba, for example they can be conjoined with *ati* a conjunction reserved only for nominal expressions (Vanderelst, 2010). Attempting to form a true subcomparative (53) or a *than* clause containing a tense or aspect particle, or a modal, as in (52-a) and (52-b) above, results in ungrammaticality. We will consider this to be a result of selectional restrictions of the verb *ju..lọ* which requires nominal expressions as argument. This is not a comment about the semantic type of the arguments of *ju...lọ*, or as Kennedy (2009) puts it "degree" versus "individual" comparison. We will argue later that both arguments of type $\langle e \rangle$ and of type $\langle d \rangle$ are possible.

(53)   *Tabili yìí gun ju ọmọ yìí ga *lọ*
         Table this be.long exceed Child this be.tall go
         "The table is longer than the child is tall."

Bhatt and Takahashi (2011) suggest that it is the syntax of a comparison construction which appear to dictate whether a 3-place or 2-place comparative operator is used. In this case, the syntax points clearly to a 3-place semantics for the comparative. However, in Yoruba, the most syntactically transparent three place operator is not the one proposed in Bhatt and Takahashi (2007, 2011). Instead, we wish the semantics of the comparative operator for Yoruba to reflect the close relationship of the gradable verb and *ju...lọ*. In the comparative operator of Bhatt and Takahashi, however, the *than* phrase (direct object) would intervene between *exceed* and the gradable verb, resulting in a not very transparent syntax/semantics interface. We therefore propose instead to use a modified version of the 3-place comparative operator, whose lexical entry is given in (54), where the order of the arguments are reversed, so that the gradable verb is the first argument. (This is the one proposed in Tiemann, Hohaus and Beck (2011) for Child English.) We can now derive the truth conditions for a basic comparison like the one in (45). (55) shows the logical form which we propose for this sentence and the resulting truth conditions are derived in (56).

(54) $\llbracket ju \rrbracket = \lambda P_{\langle d,\langle e,t \rangle \rangle}.\lambda x.\lambda y.Max(\{d : P(d)(y)\}) > Max(\{d : P(d)(x)\})$

Definition of Max:

$max(D_{\langle d,t \rangle}) = \iota d : D(d) = 1 \& \forall d'[D(d') = 1 \rightarrow d' \leq d]$

(55)

```
                            /\
                           /  \
                          /    \
                         /      \
                        /        \
                       /          \
                      /\          /\
                     /  \        /  \
            Joko yii⟨e⟩        /    \
            (this chair)      /      \
                             /\       \
                            /  \      /\
                      da⟨d⟨e,t⟩⟩  ju⟨⟨d⟨e,t⟩⟩,⟨e⟨e,t⟩⟩⟩   iyen⟨e⟩
                                                           (that chair)
```

da$_{\langle d\langle e,t \rangle \rangle}$ ju$_{\langle \langle d\langle e,t \rangle \rangle,\langle e\langle e,t \rangle \rangle \rangle}$

$\lambda d.\lambda x.$ niceness (x) $\geq$ d $\lambda P_{\langle d\langle e,t \rangle \rangle}.\lambda x.\lambda y.$ Max($\{$d:P(y)(d)$\}$) >
                                                        Max($\{$d:P(x)(d)$\}$)

iyen$_{\langle e \rangle}$
(that chair)
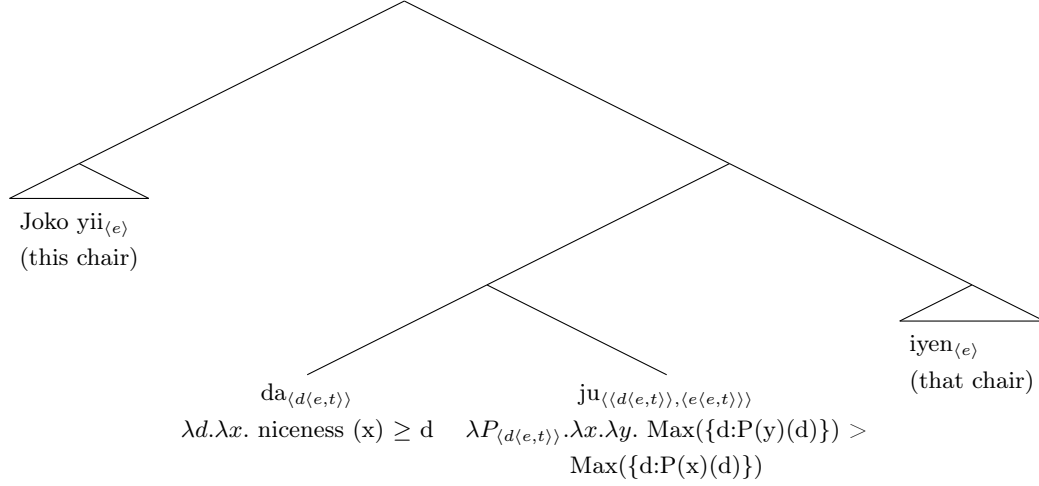
(56)   [[[Joko yii [[da ju] iyen]]]
       = [[[[da ju] iyen]]]([[Joko yii]])
       = [[[[da ju]]]([[iyen]]) ([[Joko yii]])
       = [[ju]] ([[da]]) ([[iyen]]) ([[Joko yii]])
       = [$\lambda P_{\langle d\langle e,t \rangle \rangle}.\lambda x.\lambda y.$ Max($\{$d:P(y)(d)$\}$) >
       Max($\{$d:P(x)(d)$\}$)] ($\lambda d.\lambda x.$ niceness (x) $\geq$ d) (THIS CHAIR) (THAT CHAIR)
       = Max($\{$d: niceness(THIS CHAIR) $\geq$ d $\}$) > Max($\{$d: niceness(THAT CHAIR) $\geq$ d $\}$)

Our analysis of basic comparatives derives the correct truth conditions with a semantics that transparently represents the syntax of Yoruba comparison constructions. As we have already remarked in Chapter One, choosing the Tieman, Hohaus and Beck variant of the 3-place comparison operator makes some predictions for scope interactions in the comparative, as it is not of an appropriate type to be QR-ed. We will come back to this later in the chapter.

Equatives

Syntactically, the Equative in Yoruba (*tó*) is just like *ju...lọ*. It is a verb which forms a serial verb construction with the gradable verb, and patterns the same way with respect to cleft constructions, tense and aspect particles and modals. Like *ju...lọ* it requires nominal arguments. *Tó* is used much more widely than its English counterpart, *as...as*. In addition to contexts where *as...as* would be used, like (57) *tó* occurs also in less comparatives (58), and is required in measure phrase constructions (62) and in degree questions (60), as well asoccuring in some

bi...ṣe clauses (63).

(57)   *O   ga   to   mi.*
           3.Sg.Nom be.tall reach 1.Sg.Acc
           "He is as tall as me."

(58)   *Mary ko   ga   tó   Bill.*
           Mary NEG be.tall reach Bill
           "Mary less is tall than Bill."

(59)   **Bawo ni   Adé ṣe ga?*
           How   FOC Ade Q be.tall

(60)   *Bawo ni   Ade ṣe ga   tó?*
           How   FOC Ade Q be.tall reach
           "How tall is Ade?"

(61)   **Mo   ga   esebata marun.*
           1SG.NOM be.tall foot   five

(62)   *Mo   ga   tó   esebata marun*
           1SG.NOM be.tall reach foot   five
           "I am five feet tall."

(63)   Dòkita mi   wo ṇ   bí   mo   sẹ ga   tó   ati   bi   mo   s ẹ
           Doctor 1.Sg.Gen measure how 1.Sg.Nom COP be.tall reach CONJ how 1.Sg.Nom COP
           tobí   tó.
           be.big reach
           The doctor measured my height and weight.

To deal with its use in this range of contexts, we have given it a relatively simple semantics (in (64)). Optionally, the standard can denote a degree rather than an individual, as long as the degree-denoting expression is syntactically a noun. In this case, the lexical entry in (65) is used. This will yield the desired truth conditions for the constructions above. In the case of the equative and measure phrase constructions, we take the inference that the subject and the object have the same height (or whatever the relevant gradable property) to be a result of pragmatic strengthening. We leave it up to the reader to calculate the truth conditions for these constructions.

(64) $[[\text{ tó}]] = \lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda x.\lambda y.Max(\{d : P(d)(y)\}) \geq Max(\{d : P(d)(x)\})$

(65) $[[\text{ tó}]] = \lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda d'.\lambda x.Max(d : P(d)(x)) \geq d'$

This concludes the discussion of basic comparison and equative constructions. We will next move on to two particular variants of the comparative. We will first look at comparatives with a complex standard term formed by a *bi...ṣe* free relative clause, then we will extend the analysis developed so far to differential comparatives.

2.2.3 *Bi...ṣe* Constructions

A phrasal account of Yoruba comparatives like the one we have proposed would rule out true subcomparatives like the English sentence in (66) and, indeed, this seems to be supported by the Yoruba data. This kind of construction was uniformly rejected by informants,(67), who offered sentences like (68) as an alternative:

(66)   The table is longer than the door is wide.

(67)   **Tabili yìí gun   ju   ọmọ yìí ga   lọ   .*
        Table this be.long exceed child this be.tall GO.
        Intended: "The table is longer than the child is tall."

(68)   *Tabili yìí gun   jù   bì   lèkùn yen ṣe fè   lọ.*
        Table this be.long exceed how door DEM Q wide GO
        "The table is longer than the door is wide and the child is tall. "
        (John Vanderelst, p.c.)

Sentences like (68) are an interesting case for the semantics of the comparative that we have developed so far. *Bi...ṣe* constructions can either occur with only the gradable verb in the free relative, as above, or may additionally contain the equative *tó*, to reach, as (69). [7] In addition to their use in "false-subcomparatives", they also occur frequently when a tense or modal particle is present in the than constituent (as in (71) and (72)) as well as outside of comparatives, for example in contexts where a translation of *height* or *weight* was elicited (70).

(69)   *Tabili yìí gun   ju   bi ọmọ yìí ṣe ga to lọ*
        Table this be.long exceed how child this Q   be.tall reach GO
        "The table is longer than the child is tall."

(70)   *Jo   ko   bi   o   ṣe ga,   bi   o   ṣe tobi   ati amin oju inu*
        Please write how 2.SG.NOM Q be.tall, how 2SG.NOM Q be.big and colour eye inside
        apoti yìí.
        box   this.
        "Please write your height, weight and eye colour in this box."

(71)   *Omotayo le   sare   ju   bi Ade ṣe le   sare   lọ.*
        Omotayo can run.fast exceed how Ade Q can run.fast GO
        "Omotayo can run faster than Ade can."

(72)   *Omotayo ga   ju   bi Olu màaṣe ga lọ*
        Omotayo be.tall exceed how Olu FUT   Q be.tall GO
        "Omotayo is taller than Olu will be."

Informants offered *how* as a translation for *bi* and this seems justified given its other uses, for example in embedded questions , (73) (74). In unembedded degree and manner questions *Bawo* is used instead (75) (76). The role of the particle *ṣe* is not so clear. In addition to occuring in

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[7]Some speakers only accept *bi...ṣe* clauses with *tó*.

questions and free relative clauses it also occurs in yes/no questions (77). Analysing it as a copula would be strange given that it occurs also in *bi...ṣe* clauses with modals (71). Nevertheless, it is very likely that *ṣe* serves a structural purpose, and we will treat it as semantically vacuous in our analysis.

(73)   *N   kò   mo   bí   a   ṣe n   se   iresi.*
         PROG 1SG.NOM know how 1.PL.NOM Q PROG cook rice
         "I know how we cook rice."
         (Schleicher 2008)

(74)   *Mo   mo   bi   Olu ṣe ga   tó.*
         1SG.NOM know how Olu Q be.tall reach
         "I know how tall Olu is."

(75)   *Bawo l'   o ṣe   debi?*
         How   FOC-2.SG.NOM Q reach.here
         "How did you get here?"

(76)   *Bawo ni   Olu ṣe ga   tó?*
         How   FOC Olu Q be.tall reach
         "How tall is Olu?"

(77)   *ṣe Olu wa*
         Q Olu come
         "Did Olu come?" (Adesola 2005)

Given the translation of *bi...ṣe* with *how* we propose to treat *bi...ṣe* constructions as free relative clauses and to give them a semantics similar to the proposals in (Jacobson 1995) and (Rullmann 1995). In these accounts the *wh*-word takes a property (or a property of degrees in our case) as input and returns the maximal plural individual of which that property is true (in our case, the maximal degree for which the property of degrees is true). Thus, *bi* is of type $\langle\langle d, t\rangle d\rangle$ and has the denotation in (78). The property of degrees which serves as input is obtained by abstraction over the trace left by the movement of *bi*. The two LFs in (79) and (80) illustrate two different possibilities for the degree argument where *bi* originates. It can either move directly out of the degree arugment of the gradable adjective, as in (80), or out of the degree argument of the equative *tó*, as in (79). [8]

(78)   [[bi]] = $\lambda P_{\langle d,t\rangle}$. Max({d: P(d)})

---

[8]The first option will seem strange to readers of Beck et al. (2011), because Yoruba behaves in other respects, for example with respect to degree questions and measure phrases, like a -DegPP language. We have no explanation for this exception to the negative setting of the DegPP.

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(79)

Bi$_{\langle\langle d,t\rangle d\rangle}$
$\lambda P_{\langle d,t\rangle}.$ Max$(\{$d:P(d)$\})$ λd

mo$_{\langle e\rangle}$

ga$_{\langle d\langle e,t\rangle\rangle}$
$\lambda d.\lambda x.$ height $(x) \geq$ d

to$_{\langle\langle d\langle e,t\rangle\langle d\langle e,t\rangle\rangle\rangle}$
$\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda d.\lambda y.$ Max$(\{$d':P(x)(d')$\}) \geq$ d

t$_d$
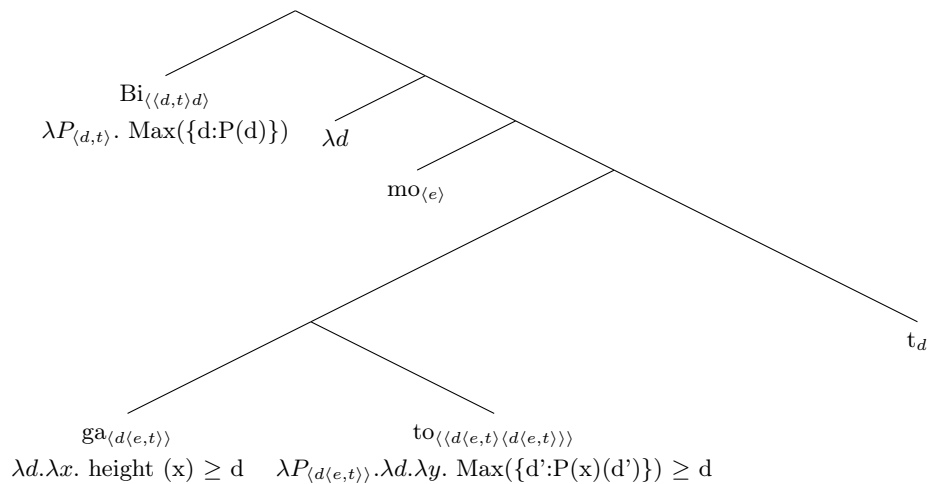
Truth conditions: Max$(\{$d: Max$(\{$d':height(SPEAKER) $\geq$ d'$\}) \geq$ d $\})$

(80)

Bi$_{\langle\langle d,t\rangle d\rangle}$
$\lambda P_{\langle d,t\rangle}.$ Max$(\{$d:P(d)$\}$=T$)$ λd

mo$_{\langle e\rangle}$

t$_d$ ga$_{\langle d\langle e,t\rangle\rangle}$
$\lambda d.\lambda x.$ height $(x) \geq$ d
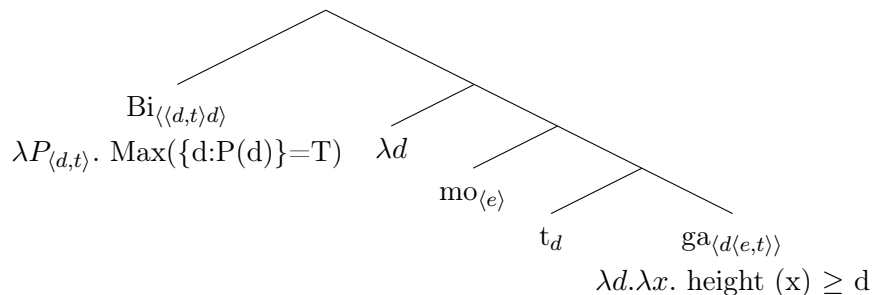
Truth Conditions: Max$(\{$d':height(SPEAKER) $\geq$ d'$\})$

Both Logical Forms yield the same results: the *bi...ṣe* denotes the maximal degree to which the speaker is tall. This is what we want. We then only need to adjust the comparative operator so that it can take degrees rather than individuals as an argument[9] and we are able to calculate the truth conditions of "false-subcomparatives" with *bi...ṣe* like (81).

(81) Tabili gun   ju   bi lekun ṣe ga   *lọ* .
      Table be.long exceed how door *cop* be.tall go.
      "The table is longer than the door is wide."

---

[9]The new denotation for the comparative is: [[-er]] $= \lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda d.\lambda x.Max(\{d' : P(d')(x)\}) > d$

We need to do this independantly of *bi...se* clauses in order to deal with comparison with a degree.

(82)

Tabili$_{\langle e \rangle}$

gun$_{\langle d \langle e,t \rangle \rangle}$
$\lambda d.\lambda x.$ lenght (x) $\geq$ d

ju$_{\langle \langle d \langle e,t \rangle \rangle \langle d \langle e,t \rangle \rangle \rangle}$
$\lambda P_{\langle d \langle e,t \rangle \rangle}.\lambda d.\lambda y.$ Max($\{$d':P(x)(d')$\}$) $>$ d

Bi$_{\langle \langle d,t \rangle d \rangle}$
$\lambda P_{\langle d,t \rangle}.$ Max($\{$d:P(d)$\}$)

λd

lekun$_{\langle e \rangle}$

t$_d$

ga$_{\langle d \langle e,t \rangle \rangle}$
$\lambda d.\lambda x.$ height (x) $\geq$ d
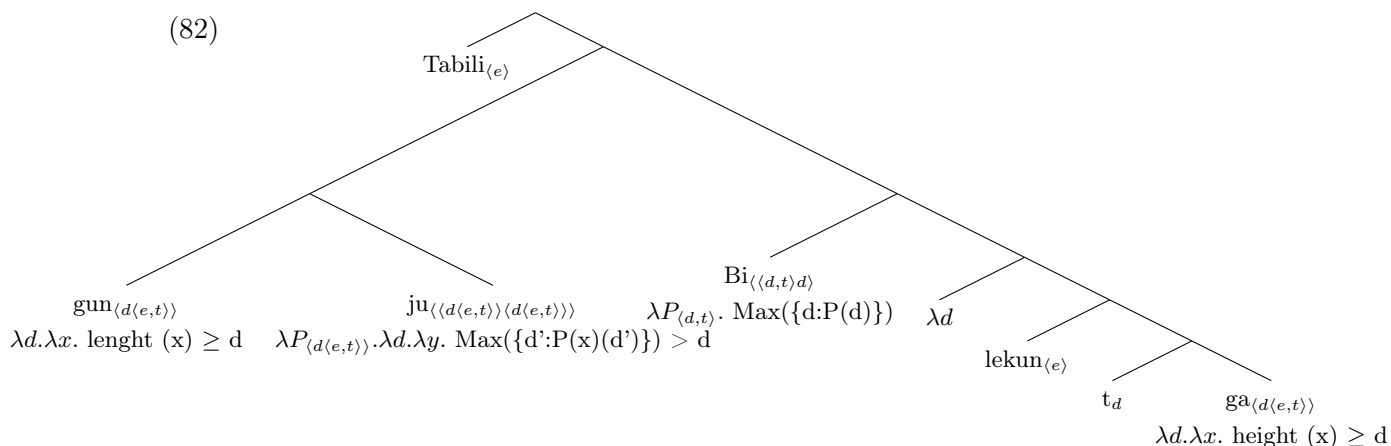
Truth Conditions: Max($\{$d: lenght(Table) $\geq$ d $\}$) $>$ Max($\{$d: height(Door) $\geq$ d $\}$)

This is a plausible analysis for *bi....ṣe* constructions and it relies on degree abstraction to derive the appropriate truth condititions. However, this makes Yoruba a +DAP, so in adopting this account we lose Beck et al. (2011)'s explanation for the lack of scope effects. We believe this is necessary and will explain why next. We have two options for analysing *bi...ṣe* without abstraction over degrees. The first would be a fully in-situ account which makes use of alternative semantics, inspired by, for example, the semantics of questions. The second would be to propose an account which contains abstraction over individuals instead of degrees.

Concerning an in-situ account, I am unaware of the existence of such an account for free relatives and leave it to others to propose one. However, there is evidence against doing things this way which comes from *bi...ṣe* comparatives with what appear to be negative island effects. In the B17 questionnaire, Yoruba was given n/a (non-assessable) for the presence/absence of negative island effects due to the lack of clausal comparatives. In *bi...ṣe* free relative clauses, however, negation results in ungrammaticality:

(83) *John ra iwé won ju bi Peter kò ṣe ra iwé won lọ.*
John buy book be.expensive exceed how Peter NEG Q buy book expensive GO.
"John bought a more expensive book than the book that Peter didn't buy."

In light of this data, we can replace Beck et al's *n/a* with a *yes* and take this as an indication of abstraction *bi...ṣe* clauses.

The next task is to show that this is abstraction over degrees rather than individuals[10]. One could try to argue, at least for the *bi...ṣe* clauses with *tó*, that what is really going on is abstraction

---

[10]I would like to make it clear that I am not considering accounts like Moltmann (2004) here, where degrees are individuals or tropes. In these kinds of accounts, the DAP would make no sense anyway. Instead, I will be assuming a traditional view of degrees and individuals as separate ontological entities.

over individuals. In this case, the *bi...ṣe* clause would denote an individual, namely, the maximal (plural) individual x such that I am as tall as x. This raises a theoretical question of whether the measure function of the main clause gradable verb could apply to a plural individual. Kennedy (2009) faces a similar problem in his discussion of Japanese *yori* clauses and concludes that some measure funtions like *many* are defined for pluralities while others, like *long* are only defined for atoms. But there is another problem: Speakers do not take *bi...ṣe* clauses to denote individuals. Consider, for example, *bi...ṣe* clauses outside of comparatives, like in (84). In this sentence, informants say the doctor is asking the patient to tell him the degree to which she is tall, and not who or what she is as tall as.

(84) Dòkita mi   wo ṇ   bí mo   sẹ ga tó   ati bi mo   s ẹ
      Doctor 1.Sg.Gen measure how 1.Sg.Nom COP be.tall reach CONJ how 1.Sg.Nom COP
      tobí   tó.
      be.big reach
      The doctor measured my height and weight.

In questions, too, informants stress that *bi* and *bawo* cannot be used to ask about other individuals that the subject is as tall as, but asking rahter for her height. Under an analysis where *bi* and *bawo* take properties of individuals, the distinction between these questions and *tani* (who) questions becomes lost. This seems to speak in favour of an account with degree abstraction.

Degree questions, like (76), could be investigated to determine whether they are further evidence for abstraction over degrees. Certainly, they look very similar to the *bi...ṣe* clauses just discussed. Beck et al. (2011) classify Yoruba as lacking true degree questions due to the presence of *tó*. However, the argument could be made that *tó* is required because of the setting of the DegPP, but that these are otherwise normal degree questions. Unlike in Japanese, the paradigm -DAP language, degree questions in Yoruba do not come with extra morphology meaning "degree" or "extent" which Beck, Oda and Sugisaki (2004) suggest could be evidence that individuals and not degrees are being manipulated. This point is made more clearly by looking at questions about differential degrees, like (85), in which no extra particle is required. However, looking to degree question for evidence about the parameter setting of the DAP faces complications because, in addition to movement based accounts, in-situ accounts of question meaning based on Alternative Semantics need to be considered as well. This would take considerable work and will have to be left for future investigation.

(85) Bawo ni   Mt. Everest ṣe ga   jù   K2 *lọ* ?
      How FOC Mt. Everst Q be.tall exceed K2 go
      "How much taller is Mt. Everest than K2?"

2.2.4 Differential Comparatives

We have just given evidence from *bi...ṣe* clauses that Yoruba is a +DAP language after all. This leaves us without an explanation for the scope facts which were taken by Beck et al. (2011) to be a result of the negative setting of the DAP. We will look at this next, but we first need to extend our analysis to differential comparatives.
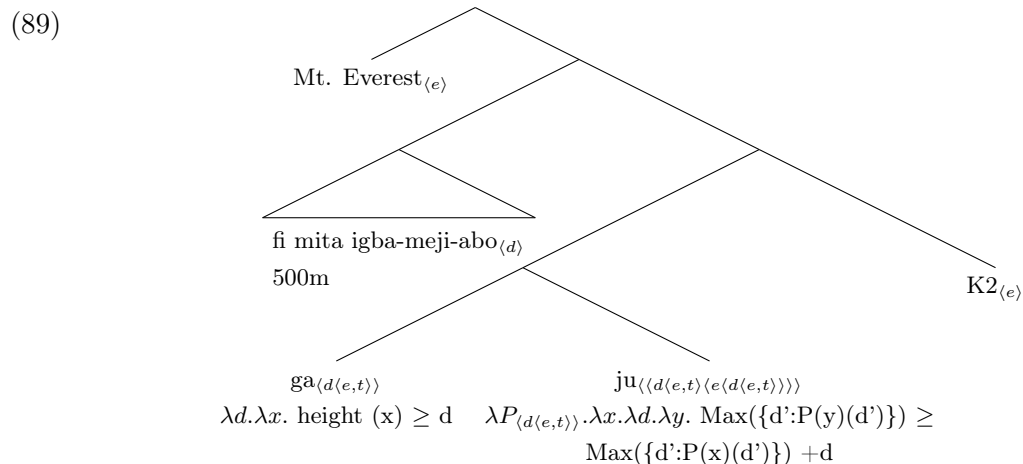
Comparatives with a differential degree are expressed in Yoruba by a prepositional phrase adjoined to the VP. Often, as in (86), the gradable verb is not overtly stated because the relevant scale is made clear by the differential.[11] This is, however, not necessarily the case. A differential measure phrase can also occur together with a gradable verb as in (87).

(86)   *Mt. Everest fi   mita   igba-meji-abo ju   K2 lọ.*
       Mt. Everest with meter 500   exceed K2 GO
       "Mt Everest is 500 meters taller than K2".

(87)   *O   fi   esebata kan ga   ju   mi   lọ .*
       3SG.NOM with foot   one be.tall exceed 1sg.acc go
       "He is one foot taller than me."

Semantically, the extension from this basic analysis follows as straightforwardly as it did for English, with the addition of an additional degree argument slot to the comparative operator. In cases where no difference degree is specified, this argument is existentially closed. The new lexical entry for *ju...lọ* is given in (88) and a sketch of the logical form of (86) is in (89).

(88) $[[ju_{diff.comp}]] = \lambda P_{\langle d,\langle e,t\rangle\rangle}.\lambda x.\lambda d.\lambda y.$ Max ({d': P(d')(y) =T}) $\geq$ Max({d':P(d')(x)}) + d

(89)

Mt. Everest$_{\langle e\rangle}$

fi mita igba-meji-abo$_{\langle d\rangle}$
500m

K2$_{\langle e\rangle}$

ga$_{\langle d\langle e,t\rangle\rangle}$
$\lambda d.\lambda x.$ height (x) $\geq$ d

ju$_{\langle\langle d\langle e,t\rangle\langle e\langle d\langle e,t\rangle\rangle\rangle\rangle}$
$\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda x.\lambda d.\lambda y.$ Max({d':P(y)(d')}) $\geq$
Max({d':P(x)(d')}) +d

---

[11]When the relevant scale is clear from the context, the gradable verb can be left out of comparatives, even in ones without differentials. We will assume that it is elided, but present at logical form. Another approach would be to take this to be a free variable which is provided by the context.

In (89), we made the assumption that the differential measure phrase is of type $\langle d \rangle$. In English, it is generally accepted that measure phrases can be of type $\langle d \rangle$, or of a higher type, namely, a quantifier over degree (type $\langle \langle d, t \rangle t \rangle$). The data from Yoruba differ in several respects from the English data. First, the kinds of measure phrases which are necessarily quantificational do not seem to be used in Yoruba. Negative evidence for this comes from translation tasks in which native speakers were asked to translate sentences with measure phrases containing *at least*, *at most*, *approximately*, *exactly*. Informants consistently produced measure phrases with bare numerals and sometimes, for example in scenarios where *exactly n* and *approximately n* were contrasted in the context, informants used paraphrases with modals verbs to convey the difference.

(90)   Context: A student comes with a 17 page draft to his teacher and tells him that he is still thinking of writing more. The maximal lenght of the paper is 20 pages. His teacher says:

Your paper can be at most 3 pages longer than that.

a.   *ìwé   náà kò   gbodò gun   fi   oju-ewe méta ju be lọ .*
     Paper def. NEG must be.long prep page   three ju be *lọ* .
     "Your paper must not be 3 pages longer than that."

(91)   Context: Two people are talking about the height of the world's highest mountains: Mt. Everest and K2.
Person A: *Mount Everest is approximately 9000 meters and K2 is approximately 8500.*
Person B: *No, Mount Everest is exactly 8848m and K2 is exactly 8611.*

a.   *Mo   ro   wipe, Everest je egbaarun-mesan nigbati K2 je*
     1.SG.NOM think that Everest is 9000   while   K2 is
     egbaarun-mejo-ati-igba-meji-abo.
     8500.
     "I think Everest is 9000 meters while K2 is 8500"

b.   *Rara, Everest je egberun-mejo-ati-igba-marun-le-ni-ogoji-le-mejo, nigbati K2 je egberun-*
     mejo-ati-igba-mefa le-mokanla
     "No Everest is 8848 meters while K2 is 8611."

The second piece of evidence comes from scope facts. Beck et al (2011) observed that scope interactions, like the ones we see in English do not arise in Yoruba comparatives[12] . Heim (2001)

---

[12]The appendix from Beck et al. contains the following example:

(i)   Context: The draft is 10 pages long, the paper has to be at least 15 but can be more.

a.   Ìwé náà gbodo gùn   ju   ìyen   *lọ* pèlú oju-ewé márùn gérégé
     Book dem. must be.long exceed dem.pronoun go prep page   five   exactly.
     "The paper must be exactly five pages longer than that." (Beck et al. 2009, appendix)

notes the following ambiguity in sentences with an exactly differential and a modal:

(92)   (The draft is 10 pages long.)
        The paper needs to be exactly 5 pages longer than that.
        Reading 1: $\forall w \in Acc : \max\{d: long(Paper,d)\} = 15pp$
        (The paper is 15 pages in every acceptible world)
        Reading2: $\max\{d: \forall w \in Acc : long(Paper, d)\} = 15pp$
        (The paper is 15 pages in the acceptable worlds where it is the shortest.)

However, a this kind of ambiguity was not observed in Yoruba:
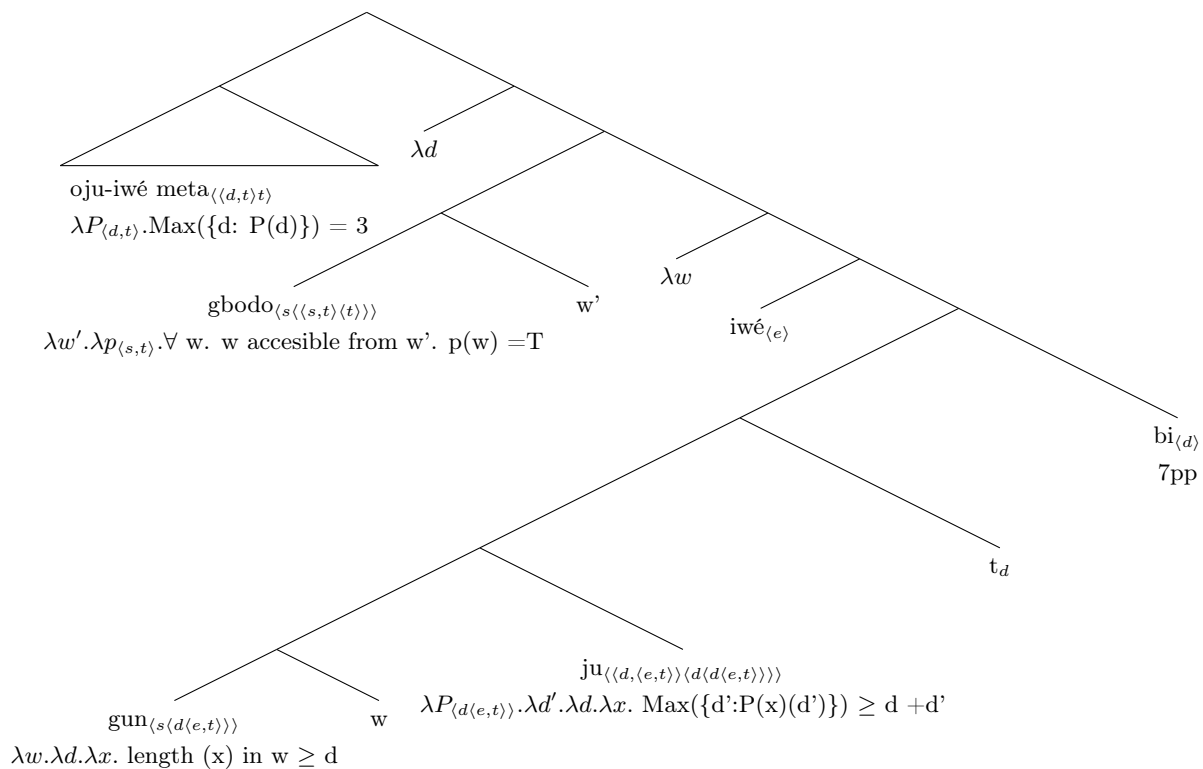
(93)   a.   Context: A student comes to her teacher with a 7 page draft of her final paper.
              The teacher says:
        b.   *iwé   náà gbodo ju   be lọ pèlù ojù-ewé méta.*
              paper the must exceed that GO PREP page   three.
              "The paper must be (at least) three pages longer than that."
        c.   Reading1: "The paper needs to be (at least) ten pages, but can be longer."
              Reading 2: * "The paper must be 10 pages long."

Beck et al. argue that the lack of ambiguitiy is due to a prohibition of abstraction over degrees in Yoruba (a [-DAP] setting). We suggest instead that the reason Yoruba appears to lack scope ambiguities in the sentences like the one above is that neither the comparative operator nor the differential MP is scopally mobile. Recall that the configuration of the three place comparative we have chosen (Tiemann, Hohaus and Beck's) is not of the right type to QR. Differential measure phrases, which we have argued to be of type $\langle d \rangle$ can not take scope either.

One might ask whether the comparative operator alone would not be enough to account for the absence of scope effects. Research on DegP scope by Beck (to appear a) has shown that the same kind of scopal ambiguitiy could arise if we take the measure phrase to be scopally mobile in addition to the comparative operator. The two LFs in below illustrate this fact for the Yoruba data.

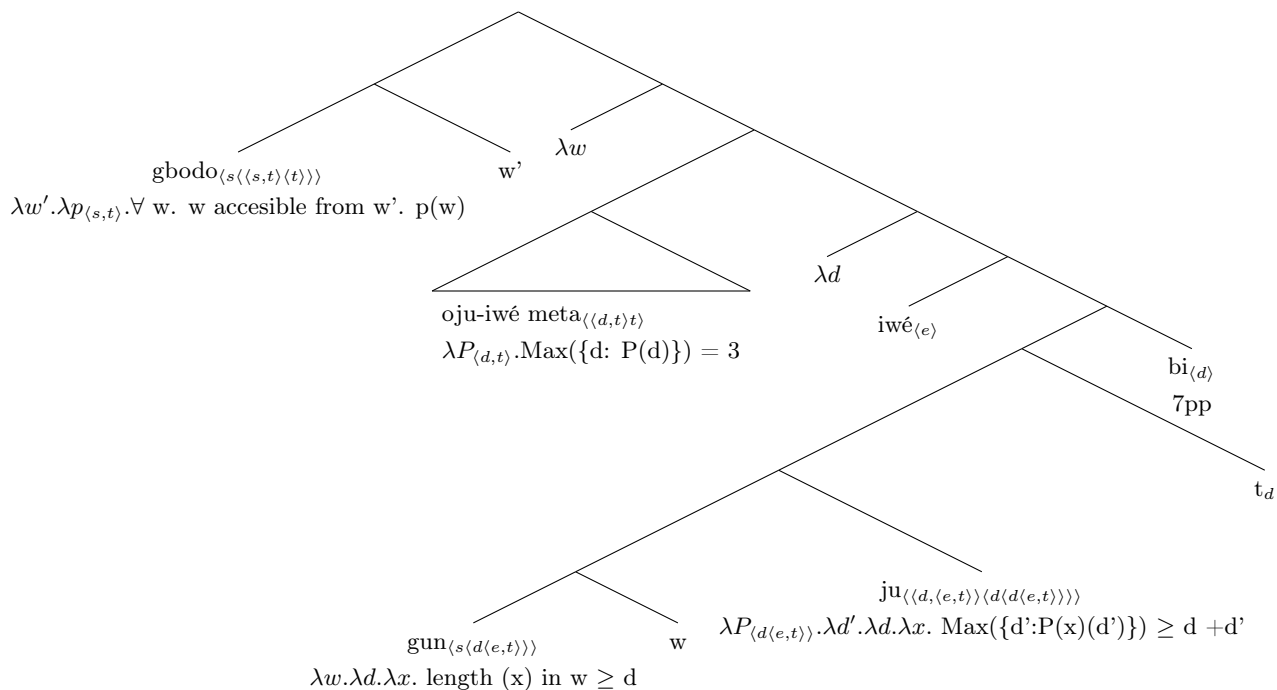I have not included this sentence in my analysis because when I asked my informants about *gérégé* they translated it as *only*. A lack of data on *gérégé* prevents me from providing a true analysis for it here, but as I was not able to elicit it in any translation tasks (in which informants were asked to translate measure phrases with *exactly*), I tentatively conclude that it does not have a similar semantics to English *exactly*.

TREE 1: Wide Measure Phrase Scope

oju-iwé meta$_{\langle\langle d,t\rangle t\rangle}$
$\lambda P_{\langle d,t\rangle}.\mathrm{Max}(\{d:\ P(d)\}) = 3$

λd

gbodo$_{\langle s\langle\langle s,t\rangle\langle t\rangle\rangle\rangle}$
$\lambda w'.\lambda p_{\langle s,t\rangle}.\forall\ w.\ w\ \mathrm{accesible\ from\ w'.}\ p(w) =T$

w'

λw

iwé$_{\langle e\rangle}$

bi$_{\langle d\rangle}$
7pp

t_d

gun$_{\langle s\langle d\langle e,t\rangle\rangle\rangle}$
$\lambda w.\lambda d.\lambda x.\ \mathrm{length}\ (x)\ \mathrm{in}\ w \geq d$

w

ju$_{\langle\langle d,\langle e,t\rangle\rangle\langle d\langle d\langle e,t\rangle\rangle\rangle\rangle}$
$\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda d'.\lambda d.\lambda x.\ \mathrm{Max}(\{d':P(x)(d')\}) \geq d$ +d'

Truth Conditions: Max($\{d:\ \forall\ w.\ w$ accesible from w'.[Max($\{d':$ length(paper) $\geq$ d'$\}$) $\geq$ 7pp +d]$\}$) =3 (The paper must be at least 10 pages long.)

TREE 2: Narrow Measure Phrase Scope

gbodo$_{\langle s\langle\langle s,t\rangle\langle t\rangle\rangle\rangle}$
$\lambda w'.\lambda p_{\langle s,t\rangle}.\forall\ w.\ w\ \mathrm{accesible\ from\ w'.}\ p(w)$

w'

λw

oju-iwé meta$_{\langle\langle d,t\rangle t\rangle}$
$\lambda P_{\langle d,t\rangle}.\mathrm{Max}(\{d:\ P(d)\}) = 3$

λd

iwé$_{\langle e\rangle}$

bi$_{\langle d\rangle}$
7pp

t_d

gun$_{\langle s\langle d\langle e,t\rangle\rangle\rangle}$
$\lambda w.\lambda d.\lambda x.\ \mathrm{length}\ (x)\ \mathrm{in}\ w \geq d$

w

ju$_{\langle\langle d,\langle e,t\rangle\rangle\langle d\langle d\langle e,t\rangle\rangle\rangle\rangle}$
$\lambda P_{\langle d\langle e,t\rangle\rangle}.\lambda d'.\lambda d.\lambda x.\ \mathrm{Max}(\{d':P(x)(d')\}) \geq d$ +d'

Truth Conditions: ∀ w. w accessible from w'.[Max({ d: Max({d': length(paper) ≥ d'}) ≥ 7pp +d })=3] (In all acceptable worlds the paper is 10 pages long.)

Hackl (2011) has argued based on processing data for English that the measure phrase does not seem to move independently of the comparative operator at LF, but why this holds and whether it holds for different configurations of the comparative construction, such as the one we are assuming for Yoruba, is an unanswered question. For the sake of the argument, we will presume that there is no such restriction in Yoruba. If this is the case, we are at a loss to explain the lack of scope ambiguities, unless we take the differential measure phrases to denote degrees. Then they must remain in-situ and only one LF is possible and it derives the *at least* reading observed in Yoruba:

TREE 3: Non-Quantifier Measure Phrase

gbodo$_{\langle s \langle \langle s,t \rangle \langle t \rangle \rangle \rangle}$
$\lambda w'.\lambda p_{\langle s,t \rangle}.\forall$ w. w accesible from w'. p(w)

w'

λw

iwé$_{\langle e \rangle}$

bi$_{\langle d \rangle}$
7pp

oju-iwé meta$_{\langle d \rangle}$
3pp

ju$_{\langle \langle d, \langle e,t \rangle \rangle \langle d \langle d \langle e,t \rangle \rangle \rangle \rangle}$
$\lambda P_{\langle d \langle e,t \rangle \rangle}.\lambda d'.\lambda d.\lambda y.$ Max({d':P(x)(d')}) > d+d'

gun$_{\langle s \langle d \langle e,t \rangle \rangle \rangle}$
$\lambda w.\lambda d.\lambda x.$ length (x) in w ≥ d

w

Truth Conditions: ∀ w. w accesible from w'. Max({d: lenght(paper) ≥ d}) ≥ 7pp + 3pp (In all worlds, the paper must be at least 10 pages.)

If you are convinced that Yoruba lacks higher type measure phrases, a question which might occur to you is why this is the case. What prevents measure phrases in Yoruba from being of higher type? We have already shown that Yoruba has the ability to abstract over degrees, so this cannot be the reason. Head initial DPs, like those with *gbodo* (all) are probably evidence that true DP quantifiers exist in Yoruba. We mentioned in the beginning of Chapter Two, however, that the extent to which such quantifiers get used in Yoruba is limited. Many expressions which would be DP quantifiers in English appear to be nominal modifiers in Yoruba. This presents

an interesting parallel to the data from the comparative where quantification type MPs seem to be, if not non-existent, then at least to be used in a very reduced range of constructions. This might be taken to suggest that the answer to our question is outside the realm of degree semantics, but this will have to remain a speculation for now. Further investigation is needed before anything more substantial can be said.

3 Outlook

3.1 Summing up

In Chapter Two, we presented new data on comparison construction in Yoruba.We looked at gradable predicates, which were shown to come in two varaities in Yoruba: gradable verbs and gradable adjectives. Despite syntactic differences, the gradable verbs were shown to be the most semantically similar to English gradable adjectives, occuring with degree operators *ju...lọ* and *tó* in a range of degree constructions including differential measure phrases, degree questions and measure phrase constructions. Gradable adjectives, which are only grammatical in positive constructions, behaved more like Klein style predicates of individuals.

We then looked at the comparative and the equative constructions, which in Yoruba are found in a Serial Verb Constructions, a somewhat less familiar construction for speakers of Indo-European languages. We began by carrying out tests for SVC-hood and constituency which revealed that comparatives and equatives were indeed serial verb constructions and that the two verbs (*ju...lọ* and the gradable verb) form a syntactic constituent. We additionally gave evidence to back up our treatment of *ju...lọ* as a single lexical item. With this basic syntactic information, we proposed a somewhat non-standard, but syntactically transparent comparison operator, inspired by the one proposed by Tiemann, Hohaus and Beck (2011): a three-place operator which takes the gradable predicate as its first argument, followed by two e type arguments, the standard of comparison and the comparee. We looked at a special case in which the standard item was a free relative clause headed by *bi* (how), which we argued to be a complex degree description, derived via abstraction over the degree argument of either the gradable verb or over one of the arguments of *tó*. Based on this evidence, we modified our comparative operator so that it could take either degrees or individuals as a standard. We argued that these complex degree descriptions could not be derived without the use of abstraction over degrees and that they were therefore evidence that Yoruba is a +DAP language, contra Beck et al (2011). We then extended this analysis to cover comparatives with differential measure phrases and we gave evidence from translation tasks and from the lack of scope effects that differential measure phrases in Yoruba may be only of type d, rather than possibly being quantifiers over degrees as they are in English.

We concluded by arguing that, taken together, the non-scopally mobile comparative operator proposed in 3.2.2 and the non-mobile measure phrases of type d were enough to explain the lack

of scope ambiguities in Yoruba without giving up the ability to abstract over degree-arguments.

3.2 Yoruba in the context of cross-linguistic variation

Yoruba posed an interesting case for the DAP. It patterned with other -DAP languages on the questionnaire devised by Beck et al. (2011), but was shown to require the ability to abstract over degree arguments in order to derive *bi...ṣe* free-relatives. We believe that Yoruba reveals a weakness in Beck et al's questionnaire: In languages like Yoruba where no truly clausal comparative is available to test Negative Island Effects, the presence or absence of scope ambiguities are a determining data point. In addition to the technical difficulties associated with eliciting scope ambiguities from linguistically naive native speakers, scope ambiguities are a particularily tricky data point because there is a range of factors which could be responsible for the observed readings. The simplest kind of ambiguities which are relevant for the DAP are Heim (2001) style ambiguities: Comparatives with a modal verb in the matrix clause coupled with either a differential measure phrase or a *less*. In Yoruba, key ingredients for these kind of constructions are missing: Yoruba does not have less comparatives and, as we have argued, does not seem to have differential measure phrases of quantificational type.

Another aspect of our analysis which is relevant in the context of cross-linguistic variation in comparison constructions is the comparison operator we have chosen. Bhatt and Takahashi (2011) argue that syntax dictates the semantic configuration of the comparative operator (whether we are dealing with a three place or two place operator). The data from Yoruba seem to support this conclusion, since we saw that the serial verb construction determined order of arguments of the comparative operator. But, Yoruba is evidence for a different configuration than the one proposed by Bhatt and Takahashi. Instead, it provides evidence in favor of the comparative operator of Tiemann, Hohaus and Beck.

3.3 Questions for further research

Some questions remain for further research. The lexical variation we observed between Yoruba and English seemed, in the case of comparatives, to come from differences in syntactical configuration. In the case of the semantic type measure phrase constructions, no such explanation is available. A question which will have to await further research is whether the lack of quantificational measure phrases in Yoruba is due to some more general restriction and whether this restriction may be at work with DP quantifiers as well.

Another question, less central to our general plot, but interesting nonetheless is the role that reduplication plays in deriving a vague predicate adjective from a $\langle d\langle e,t\rangle\rangle$ adjective. Does

the reduplication simply contribute *Pos* as we suggested in 3.2.1, or could we find a unified semantics for reduplication which derives the vague predicate meaning as well explaining the role reduplication plays in other constructions?

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