How to do comparison in a language without degrees: a semantics for the comparative in Fijian

Hazel Pearson
Dept. of Linguistics
Harvard

`hpearson@fas.harvard.edu`

Abstract

Kennedy (2009) distinguishes between implicit and explicit comparison (IC/EC): IC is exemplified by 'Compared to John, Mary is tall', and EC is of form, 'Mary is taller than John'. Kennedy goes on to ask whether there are IC-only languages. We show that Fijian is an example of one. Along the way, we demonstrate that not all of Kennedy's diagnostics for IC can be reliably applied across languages, and offer some novel diagnostics of our own. We propose a semantics for Fijian comparatives that makes no appeal to degree arguments, and discuss possibles source of the cross-linguistic variation.

1   Introduction

Kennedy (2009) raises the question of whether there are any languages which only have implicit comparison (IC), where IC is as defined in (1) and exemplified in (2a). (2a) might in turn be contrasted with (2b), which exemplifies explicit comparison (EC).

(1)   *Implicit comparison*   (Kennedy 2009)
Establish an ordering between objects x and y with respect to gradable property g using the positive form by manipulating the context such that the positive form is true of x and false of y.

(2)   a.   Compared to John, Mary is tall.
       b.   Mary is taller than John.

In some languages such as Motu, the so-called conjoined comparative is employed (3): the gradable property is predicated of the subject of one conjunct, and asserted not to hold of the subject of the other conjunct. Kennedy suggests that languages that use this strategy may be good candidates for IC-only languages. In the present work, we show that Fijian (Austronesian, Oceanic) is an implicit comparison-only language. Since Fijian employs the separative comparative[1], we learn that implicit comparison is not limited to the conjoined comparative.

---

[1] A comparative construction is separative if the morpheme introducing the standard of comparison is a preposition.

(3)   Mary   na   lata   to   Frank   na   kwadogi
        Mary   TOP   tall   but   Frank   TOP   short
        'Mary is taller than Frank'.   *~ Motu (Beck et.al. in press:*
Appendix)

2   Some data

We begin with some examples of the comparative of superiority (4) and superlative (5)[2,3].

(4)   a.   e   qase   mai   vei   Meri   'o   Pita
                3SG   old   DIR   PRP   Mary   PERS.DET.   Peter
        'Peter is older than Mary'.

        b.   e   rua   na   teveli ka   dua   e   lekaleka
                3SG   two   ART   table   CONJ   one   3SG   short
                'This table is shorter than that one'. (Lit: There are two tables and one is
short.)

(5)   Pita   e   qase   mai   vei   ira
        Peter   3SG   old   DIR   PRP   3PL
        'Peter is the oldest'.

Here are some noteworthy properties of this brief data set. (i) There are no overt morphemes meaning *more* or *most*. (ii) The comparative of superiority and superlative are morphosyntactically identical. (iii) The comparative of superiority has two forms: one in which the standard of comparison is introduced by a directional marker *mai* and a preposition *vei*, and a conjoined comparative; we shall confine our attention to the first of these[4].

3   Diagnosing implicit comparison

Let's begin by expanding the range of data that we include under the label *implicit comparison*. To the *compared to...* construction exemplified in (2a), we will add another, (6), which as far as we know has not yet been discussed in the literature on implicit comparison.

(6)   Of John and Mary, Mary is the tall one.

Moreover, notice that (7a) and (7b) are minimally different from (2a) and (6) respectively.

---

[2] I confine my attention here to the comparative of superiority and superlative for reasons of space only. See Pearson (2009) for a semantics for the comparative of inferiority and equative that is compatible with everything I say here.

[3] Abbreviations employed in this paper: ART = article; CONJ = conjunction; DIR = directional; LNK = linker; NMLZ = nominalizer; PERS.ART = personal article (used with proper names); PRP = preposition; TOP = topic.

[4] Notice that the Fijian conjoined comparative differs from the Motu type. The construction is certainly worthy of further attention, but this is beyond the reach of the present paper.

(7)   a.   Compared to John, Mary is taller.
        b.   Of John and Mary, Mary is the taller one/is taller.

We shall say that examples such as (7), where comparative morphology is used, instantiate *weak implicit comparison* (WIC), and that cases like (2a) and (6), where the positive form of the predicate is used, constitute *strong implicit comparison* (SIC)[5]. Kennedy's interest is in SIC (for him, implicit comparison by definition employs the positive form), and hence the diagnostics that he proposes are diagnostic of SIC and not WIC[6]. We are now in a position to make more precise the claim to be defended in this paper: Fijian is an SIC-only language, and hence it has no comparative morphology. Since we have already observed that Fijian has no overt comparative morphology, our task is to show that it also lacks covert comparative morphology.

Our suspicions that this may be the case are aroused by consideration of a diagnostic proposed by Beck, Oda and Sugisaki (2004). They observe that implicit comparison yields a felicitous response to A's question in (8), but explicit comparison does not. Turning to Fijian, we find that the comparative sentence in (9) is a suitable answer to the same question; hence we have evidence that we are looking at implicit comparison, although we are yet to apply tests that are fine-grained enough to tease apart WIC and SIC.

(8)   A: How does your son's height compare to yours when you were his age?
        B: (i) ??He's taller than me.   EC
               (ii) ✓Compared to me, he's taller.   WIC
               (iii) ✓Compared to me, he's tall.   SIC

(9)   E   balavu   sara   mai   vei   au.
        3SG   tall   very   DIR   PRP   1SG
        'He's taller than me'.

Let me offer three novel diagnostics which will enable us to discriminate between the two flavors of implicit comparison. The first exploits an exception to the generalization that for any gradable predicate *g*, the proposition that A is more *g* than B can be expressed by a sentence of form, 'Compared to B, A is *g*'. With certain predicates, the strong implicit comparison configuration turn out to have different truth conditions from its EC and WIC counterparts. One such predicate is *surprising*. Whereas (10a,b) assert that the maximal degree to which the length of the table is surprising is greater than that to which the height of the chair is surprising, (10c) says that in light of how tall the chair is, it is surprising how long the table is. The latter might be used to convey that the two pieces of furniture seem out of proportion; neither of (10a,b) can be used to make such a claim[7].

---

[5] We have two reasons for distinguishing between weak and strong IC: (i) Since English has both modes of comparison, it is worth asking whether there are languages that employ only WIC, and whether there are languages that employ only SIC. (ii) Kennedy shows that Japanese *yori*-comparatives fail his diagnostics for (what we call) SIC, and hence concludes that it has EC. The distinction that we have introduced leaves open the possibility that Japanese has WIC rather than EC. (See Beck (2009), Oda (2008) and Pearson (2009) for relevant discussion). Similarly, when we turn to Fijian we shall have to ensure that our diagnostics can discriminate between EC, WIC and SIC.

[6] From now on we shall treat Kennedy's diagnostics as diagnostics for SIC, assuming it to be understood that he describes them simply as diagnostics for implicit comparison.

[7] The attentive reader will note that (10c) does not conform to Kennedy's definition of implicit comparison. One might respond either by claiming that the definition is wrong, or by saying that (10c) is not an example of implicit comparison. If one takes the latter view, one might even question the legitimacy of diagnosing IC using a

(10)   a.   The length of the table is more surprising than the height of the chair.   EC
       b.   Compared to the length of the table, the height of the chair is more surprising.
            WIC
       c.   Compared to the length of the table, the height of the chair is surprising.   SIC

The Fijian comparative employing *surprising* (11) has the same meaning as (10c); it cannot express what (10a,b) say. This is our first piece of evidence that Fijian is an SIC language[8].

(11)   Na   balavu ni   teveli e   kurabuitaki mai na   cecere ni   dabedabe
       ART length LNK table 3SG   surprising DIR ART   height LNK   chair
       'Compared to/given the height of the chair, the length of the table is surprising'.

   Another difference between EC/WIC and SIC is highlighted by the following triple.

(12)   a.   # John is a taller guy than Mary.   EC
       b.   # Compared to Mary, John is a taller guy.   WIC
       c.   Compared to Mary, John is a tall guy.   SIC

(12a,b) are infelicitous (they presuppose that Mary is a man); (12c) is considerably better[9]. Since no presupposition failure arises in Fijian, we have more evidence that it is an SIC language[10].

(13)   e   goneyalewa   qase   'o   Meri   mai   vei   Jone.
       3SG   girl   old   PERS.ART   Meri   DIR   PRP   John
       'Mary is older than John'. (Lit: 'Mary is an old girl mai vei *John').*

Finally, the interaction of focus with SIC is different from EC or WIC, at least in the variety of SIC that employs an *of*-phrase (14e).

(14)   a.   John only likes Peter more than Mary.   EC
       b.   ??Compared to Mary, John only likes Peter more.   WIC

---

construction that does not instantiate IC. I don't think we need to be overly worried about this. We are interested in whether Fijian comparatives have more in common with 'Compared to B, A is *g*' than they do with 'Compared to B, A is more *g*', or 'A is more *g* than B'. Cases where this appears to be the case will be taken as evidence that Fijian is an SIC-only language, regardless whether one thinks those cases instantiate SIC or some other, yet to be understood construction. Note incidentally that this approach is not the same as claiming that some morpheme in Fijian means the same thing as *compared (to)*. The semantics that we will give for *mai* has both similarities to and differences from the semantics of *compared (to)*. Thanks to Li Julie Jiang and an anonymous reviewer for pushing me to think further about these considerations.

[8] Vera Hohaus (p.c.) points out that this test is only suitable for languages in which *surprising* is gradable. I do not know whether there are languages where this is not the case, but since the predicate can combine with *sara* ('very'), as shown in (i), I take it that it is indeed gradable in Fijian.
(i)   Na   balavu ni   teveli   e   kurabuitaki   sara
       ART   length LNK   table   3SG   surprising   very
       'The length of the table is very surprising'.

[9] For some speakers, (12c) also seems to presuppose that Mary is a man. I believe that this presupposition is at least less robust in (12c) than in (12a-b); the former appears to be more acceptable than the latter two for many speakers.

[10] Some care is needed in applying this test. If Fijian had no adjectives, as has been argued for other Austronesian languages (eg Javanese, Vander Klok (to appear)), apparent cases of adjectival modification would have to be analysed as reduced relative clauses. (13) would then mean, 'Mary is a girl who is older than John', and its felicity would have no bearing on the SIC/WIC/EC distinctions. For arguments that Fijian does indeed have adjectives, see Pearson (in preparation).

c.	??Compared to Mary, John only likes Peter.	SIC
d.	??Of Peter and Mary, John only likes Peter more.	WIC
e.	Of Peter and Mary, John only likes Peter.	SIC

In (14e), focus associates with *Peter*, and the sentence is evaluated with respect to the alternatives {John likes Peter, John likes Mary}. This reading is not available with EC, WIC/SIC of the *compared to...* type, or WIC of the *of*-phrase type. We take the availabilty of this reading in Fijian (15) as further evidence that it as an SIC language.

(15) E   talei-taki Pita ga   'o   Jone   mai   vei   Meri
      3SG   likes   Peter only   PERS.ART   John   DIR   PRP   Mary
      'Of Peter and Mary, John only likes Peter'.

On the basis of our diagnostics, then, it seems that Fijian is an SIC language. How does it fare with respect to Kennedy's tests for strong implicit comparison? Here the results are rather more mixed. For instance, Kennedy observes that SIC is infelicitous in what he calls 'crisp judgment' contexts – contexts in which the difference in the degree to which the individuals being compared possess the gradable property is small. This can be seen by considering how the sentences in (16) are judged in a context where Mary is just 2cm shorter than Peter.

(16) a. | Mary is shorter than Peter. | EC |
      b. | Compared to Peter, Mary is shorter. | WIC |
      c. | # Compared to Peter, Mary is short. | SIC |

The prediction seems to be that the Fijian counterpart of (16) should be infelicitous in the same context. Yet (17) shows that this is not borne out. We shall return to this issue.

(17) E   lekaleka   'o   Meri   mai   vei   Pita.
      3SG   short   PERS.ART   Mary   DIR   PRP   Peter
      'Mary is shorter than Peter'. (felicitous with a 2cm difference in height)

We also find mixed results when we consider the implicatures associated with SIC. Kennedy identifies one of these; however Sawada (2009) draws attention to an additional one. I shall call the tests involving implicatures the Kennedy-Sawada tests. Sawada observes that a sentence like (18c) implicates that the standard of comparison is tall, but (18a) and (18b) carry no such information. Likewise, my consultant reports that if she heard (19) out of the blue, she would conclude that the referent of *na teveli oya* were a tall table, although the sentence could also be uttered in a situation where both tables were short. However, Kennedy and Sawada both observe that (18c) also carries a negative implicature for the subject: in Sawada's terms, that the subject is not definitely short. In fact, my consultant reports that (19) suggests that the subject *is* short. So, it seems we have another point in favor of an SIC analysis, and another against.

(18) a. | This table is shorter than that table. | EC |
      b. | Compared to that table, this table is shorter | WIC |
      c. | Compared to that table, this table is short. | SIC |

(19) E   lekaleka na   i   teveli oqo   mai   na   teveli oya
      3SG   short   ART   NMLZ   table   this   DIR   ART   table   that
      'This table is shorter than that table'.

We are on firmer ground with Kennedy's test involving minimum standard gradable adjectives like *bent*. He notes that in a context where a minimum standard property holds of both the comparee and the standard of comparison, SIC is infelicitous (20c). So too in Fijian (21).

Context: Pipe A and Pipe B are both bent; Pipe A more so than Pipe B.

(20)	a.	Pipe A is more bent than Pipe B.	EC
	b.	Compared to Pipe B, Pipe A is more bent.	WIC
	c.	# Compared to Pipe B, Pipe A is bent.	SIC

| (21) | # E | takelo | na | vaivo | oqo | mai | na | vaivo | oya. |
| | 3SG | curved | ART | pipe | this | DIR | ART | pipe | that |

'This pipe is more bent than that pipe'.

The last of Kennedy's tests for SIC is also the last that Fijian fails, and concerns the availability of differential measure phrases (MPs). Kennedy observes that these are impossible in SIC constructions (22). Yet we found that they are available in Fijian (23).

(22)	a.	Mary is one year older than Peter/older than Peter by one year.	EC
	b.	Compared to Peter, Mary is one year older/older by one year.	WIC
	c.	??Compared to Peter, Mary is one year old/old by one year.	SIC

(23)	'o	Meri	e	qase	mai	vei	Pita	e	na	dua
	PERS.ART	Mary	3SG	old	DIR	PRP	Peter	PRP	ART	one
	na	yabaki.								
	ART	year								

'Mary is one year older than Peter'.

We find ourselves in a quandary. Our three novel diagnostics, along with one and a half of Kennedy's four tests, suggest that Fijian is a strong implicit comparison language. Yet contrary to what Kennedy says one should expect of SIC, Fijian permits comparatives in crisp judgment contexts, lacks negative implicatures for the subject, and tolerates differential measure phrases. I see two possible responses to the data. The first is to treat Fijian as a mixed WIC/SIC language. One could say, for example, that the language has covert comparative morphology which only comes into play as a last resort, for example to compose with a differential MP. Alternatively, we might retain a pure SIC analysis by rejecting the premise that all of the properties exhibited by SIC in English – a language that also has EC and WIC at its disposal – will carry over to an SIC-only language. I think that the latter option is the more promising of the two, for the following reason: some of our tests for SIC not only teach us that Fijian has SIC, but also rule out the possibility that it has WIC. If there were an optional covert degree morpheme, we would need a story about why constructions involving *surprising* are not ambiguous between weak and strong implicit comparison readings, and we would be at a loss to explain why comparatives with minimum standard gradable adjectives cannot be rescued in the contexts Kennedy describes. We maintain, therefore, that the only type of comparison available in Fijian is SIC. In the following section, we provide a semantics for the Fijian comparative that captures this insight; once we have done this, we will be in a position to respond to the challenge provided by the diagnostics involving crisp judgments, implicatures and differential measure phrases.

4   A semantics for the Fijian comparative

Our claim that Fijian is a strong implicit comparison language encompasses a particular view about how the language goes about forming comparisons (roughly, that its comparatives have more in common with English 'Compared to B, A is P' or 'Of A and B, A is P', than they do with 'A is more P than B is'). In addition, when we say that Fijian has no form of comparison other than SIC, we claim that it has no comparative morphology. A simple way to capture this second insight is to say that in Fijian, there are no lexical items that introduce degree arguments. Within the framework proposed by Beck et. al. (in press), this would amount to claiming that Fijan has the negative setting of the Degree Semantics Parameter (DSP), stated in (24).

(24)   *Degree Semantics Parameter*   (Beck et.al. (in press))
        A language {does/does not} have gradable predicates (type $<d,<e,t>>$ and related),
i.e.   lexical items that introduce degree arguments.

So how does one form comparisons in a language without degrees? A promising alternative is to adopt the semantics for gradable predicates proposed by Klein (1980, 1991). Let a gradable predicate g be interpreted relative to a comparison class X – a set that is salient in a context c. If X is a suitable comparison class for g in c, every element of X will be an element of either {x: x counts as g in c} or {x: x counts as $\neg g$ in c}. (25) is a sample lexical entry for *balavu* ('tall').

(25) $[\![balavu]\!]^c = \lambda X \, \lambda x \in X.$ x counts as tall in c, with respect to X[11]

The idea is this: comparative readings are obtained by via the directional particle *mai*[12], whose role is to determine what, aside from the argument of the predicate, is in the comparison class. By providing information about which individuals fall on which side of the c-class's threshold for, say, tallness, a Fijian comparative yields inferences about relative degrees of height[13]. In a moment we shall show how this works in more detail. But for now let us acknowledge that this view of the contribution of *mai* cannot be quite the whole story. We have seen sentences employing *mai* whose meaning is not comparative as such. This is true of our example with *surprising* (11), and of the example that we used to investigate focus association induced by *only* (15). We shall amend our claim slightly in order to give a unified semantics for *mai* that can account for both comparative and non-comparative readings: *mai*'s role is to fix, not the c-class, but the domain of discourse. Given a c-class variable introduced by a gradable predicate, the value of this variable may be, but need not be, identical with the domain of discourse.

---

[11] What it is to 'count as tall' is of course a context-dependent matter not wholly accounted for by merely invoking comparison classes. A complete semantics might also incorporate a threshold variable determining the cut-off for tallness within the c-class, whose value is contextually supplied. I set these matters aside for simplicity's sake.

[12] One might wonder about the contribution of *vei*, which follows *mai* in many of the examples we have seen. *Vei* is employed only when its complement is a proper name; when it is a person-denoting common noun phrase *vua* is used; with common noun phrases denoting inanimates no preposition is pronounced. Hence it seems that the prepositions are not semantically contentful, but rather appear for case reasons (presumably noun phrases that do not occur with an overt preposition are complements of a null P head).

[13] This is essentially what Kennedy (2009) says about the contribution of *compared to...* in English IC.

The second point to be mindful of is that we need to capture not only the comparative of superiority, but also the superlative: we have seen that these are morphosyntactically identical. Given this, we would expect to find sentences that have a both a comparative of superiority reading and a superlative reading. This is just what we find with (26). The extraordinary thing is that (26) also tolerates a third reading, (iii). Our task, then, is to give a semantics for *mai* that admits of the three possible readings for (26). It is to this task that we now turn.

(26)   e   balavu 'o   Hazel mai vei ira   na   kai   Sikoti
        3SG   tall   PERS.ART Hazel DIR PRP 3PL   ART   people Scots
        (i) *'Hazel is taller than the Scottish people'.*
        (ii) *'Hazel is the tallest Scottish person'.*
        (iii) *'Hazel is tall for a Scottish person'.*

Here's the idea: a sentence of form 'A is P *mai* B' presupposes that the domain of discourse consists only of A, B and any individuals mentioned in P[14]. This presupposition is introduced by '*mai* B', a predicate modifier which contributes no further semantic content. Before stating the semantics for *mai*, some techinical preliminaries: we assume that if use of an expression E in a context c involves mentioning an individual x, then x is presupposed to be an element of the domain of discourse for c, 'U_c'; hence for any context c which satisfies the presuppositions of an expression E that mentions an individual x, $x \in U_c$. Presuppositions will be stated using the fraction-style notation employed in Sauerland (2005), whereby presuppositions are given on the top line, and semantic values appear on the lower line. (27) is the entry for *mai*[15].

(27) $[\![mai]\!]^c_{<e,<<e,st>,<e,st>>>}$ =
        $\lambda x \, \lambda P \, \lambda y \, \lambda w \in c. \underline{U_c = \{x\} \cup \{z: \forall c'[c' \in domain(P(y)) \rightarrow z \in U_{c'}]\}}$
        $[\![P(y)(w)]\!]^c = 1$

Since the resulting presupposition merely concerns the structure of the domain of discourse, and doesn't require a consensus concerning extralinguistic facts, it is easy to accommodate. Where a gradable predicate *g* is involved, a comparison class variable is introduced which in the unmarked case takes as its value the set of individuals in the domain of discourse (U)[16]. That is provided of course that *g*(U) is defined. We therefore need some constraints on what may be a suitable comparison class argument for a given gradable predicate. These are stated in (28).

(28)   For any gradable predicate *g*, any set X and any context c, *g*(X) is defined in c only
        if:
        (i) $\forall x[x \in X \rightarrow x$ counts as *g* in c, w.r.t. X $\vee$ x counts as ¬*g* in c, w.r.t. X]
        (ii) $\exists x[x \in X$ & x counts as *g* in c, w.r.t. X]
        (iii) $\exists x[x \in X$ & x counts as ¬*g* in c, w.r.t. X][17]

---

[14] The third provision is intended to accommodate sentences involving transitive verbs, such as (15).

[15] The invocation of intensional types may seem superfluous just now; the pay off will come in the next section.

[16] Cf. Klein (1980: 13): 'In many cases, the comparison class is just the set of things that the participants in a conversation happen to be talking about at a given time'.

[17] Arguments for (ii) and (iii) can be found in Klein (1980). (i) departs from Klein in making the simplifying assumption that there is no extension gap; we would need to invoke extension gaps, however, if we were to attempt to handle vagueness phenomena, a task which is unfortunately beyond the limits of what can be achieved here.

Putting everything together, we can provide a bottom-up derivation of the meaning of 'Mary is tall *mai* John' (= 'Mary is taller than John').

(29) $[\![mai]\!]^c = \lambda x_e \lambda P_{<e,st>} \lambda y_e \lambda w \in c.$ $\underline{U_c = \{x\} \cup \{z: \forall c'[c' \in domain(P(y)) \rightarrow z \in U_{c'}]\}}$
                                                                 $[\![P(y)(w)]\!]^c = 1$

$[\![mai (John)]\!]^c = \lambda P_{<e,st>} \lambda y_e \lambda w \in c.$ $\underline{U_c = \{John\} \cup \{z: \forall c'[c' \in domain(P(y)) \rightarrow z \in U_{c'}]\}}$
                                                                 $[\![P(y)(w)]\!]^c = 1$

$[\![mai\ John\ (tall_X)]\!]^c = \lambda y_e \lambda w \in c.$ $\underline{U_c = \{John] \cup \{z: \forall c'[c' \in domain(tall_X(y)) \rightarrow z \in U_{c'}]\}}$
                                                                 $[\![tall_X(y)(w)]\!]^c = 1$

$[\![tall_X\ mai\ John\ (Mary)]\!]^c =$
        $\lambda w \in c.$ $\underline{U_c = \{John\} \cup \{z: \forall c'[c' \in domain(tall_X(Mary)) \rightarrow z \in U_{c'}]\}}$ $=$
                                     $[\![tall_X(Mary)(w)]\!]^c = 1$

        $\lambda w \in c.$ $\underline{U_c = \{John, Mary\}}$
                Mary counts as tall in c, with respect to X, at w

The result: 'Mary is tall *mai* John' presupposes that the domain of discourse is {John, Mary}, and asserts that Mary counts as tall with respect to her c-class. We have a little more work to do to show that the sentence conveys that Mary is taller than John. The first step is to supply the value of the c-class variable. Since the domain consists of only John and Mary, the plausible answer is that these two individuals, and no others, make up the c-class. Given that the c-class must be a suitable argument for *tall*, and Mary counts as tall by virtue of the meaning of the sentence, we can infer that John does not count as tall, by (28iii). Hence Mary is taller than John.

So much for the basic case. The challenge now is to show how a sentence of form 'A is P *mai* B' could have three different interpretations – 'A is more P than B', 'A is the most P of the B's', and 'A is P for a B', as we found to be the case with (27). We have already shown how the comparative of superiority works. Notice that here, the two individuals being compared are presupposed to have disjoint reference. With the superlative and the 'A is P for a B' construction, the denotation of the subject is presupposed to be included in the set to which it is being compared. Presumably this is the reason for the contrast between (30a) and (30b,c).

(30)   a.   # Chomsky is smarter than a linguist[18].
        b.   Chomsky is the smartest linguist.
        c.   Chomsky is smart for a linguist.

We propose that which interpretation is assigned to a sentence of form 'A is P *mai* B' is (partially) determined by whether the context includes only those worlds in which $[\![A]\!]$ is included in $[\![B]\!]$, or whether their denotations are presupposed to be disjoint. The latter case yields the comparative of superiority, in the manner already exemplified in (29). In the former case, we get either the superlative or 'A is P for a B'. We shall deal with the latter case first, taking (26) as our case study. The reader can verify that given our semantics, (26) presupposes that the domain of discourse is {Hazel} $\cup$ $[\![the\ Scots]\!]$, and asserts that Hazel

[18] I have in mind the generic interpretation of *a linguist*. If this expression is interpreted as a singular indefinite, (30a) is much improved.

counts as tall, with respect to her comparison class. Let's say then that the comparison class is {Hazel} $\cup$ ⟦the Scots⟧; since the interpretation we are interested in arises only in contexts that entail that {Hazel} $\subseteq$ ⟦the Scots⟧, the c-class is simply ⟦the Scots⟧. The sentence therefore communicates that Hazel is in the proper subset of Scots who are tall; that is, that she is tall for a Scot.

To derive the superlative reading, we shall maintain our assumption that Hazel is presupposed to be a Scot, but add a second presupposition: that the threshold for tallness is such that only one member of the c-class falls into the proper subset of individuals that count as tall. Since the sentence asserts that Hazel is tall, it follows that she must be the tallest Scot.

With the semantics in place, we are now in a position to address the challenge from those of Kennedy's diagnostics for strong implicit comparison that Fijian fails.

5   The problem of differential measure phrases

We need to explain why it is that Fijian, an SIC language, tolerates differential measure phrases. The first step is to appreciate why it is surprising to encounter such expressions in an SIC language. We are used to thinking of differential measure phrases as arguments of the function denoted by comparative morphology. Hence differential MPs require comparative morphology in order to enter into the semantic composition in the appropriate way. Since SIC languages lack such morphology, we expect that they will lack differential measure phrases too.

One reply to this line of argument is to point out that it takes it for granted that the only strategy UG makes available for differential MPs involves treating them as arguments of comparative morphemes. It is conceivable that other languages may have other strategies, and that Fijian may be such a language. This is a point worth making, but in fact one need not even go that far: it turns out that English has other strategies too. To see this, consider (31).

(31)   a.   John failed the exam by 20 points.
         b.   Peter missed the target by 2cm.
         c.   Mary won the race by 59 seconds.

Observe that *fail the exam*, *miss the target*, and *won the race* are not gradable predicates[19,20]. As such, no degree phrase is projected and there is no place for comparative morphology. Nonetheless, differential measure phrases combine quite happily with these expressions. If we can give a semantics for English *by*-phrases that permits them to combine with the predicates in (31), we may be able to apply the same semantics to differential measure phrases in Fijian[21].

---

[19] I take the inability of these predicates to combine with comparative morphology or degree modifiers such as *very* or *extremely* as evidence that they are not gradable.

[20] I learned after presentation of this work that these predicates were independently discovered and discussed in Schwarzschild (2008) His semantics for *by*-phrases occurring with these predicates is different from that given below.

[21] I leave it to future research to discover what determines whether an English non-gradable predicate may

Note that to the extent that any comparisons are involved in (31), they are between actual and counterfactual situations. For example, (31a) says that John failed the exam and would not have done so had he scored 20 points more than he actually scored. The semantics to be proposed for an expression like *by 20 points* will build on this insight. We will treat the *by-*phrase as a predicate modifier whose semantics involves quantification over counterfactual worlds. The first thing to do is to describe an accessibility relation R between worlds (32).

(32) $\forall w \forall w'$: $\langle w,w' \rangle \in$ R iff w' is just like w except that the number of points John received in w $\neq$ the number of points John received in w'.

The counterfactual worlds relevant to the meaning of (31a) are only those in which the number of points John received is different from the number of points he received in the evaluation world. (32) ensures that the accessibilty relation is sufficiently constrained to capture this. Next, we need an operator that can supply the difference between the number of votes John actually received and the number received in a counterfactual world. Call it DIFF. It is defined in (33).

(33)   For any two numbers n_1 and n_2, DIFF$(n_1, n_2) = n_1 - n_2$ if $n_1 > n_2$, or $n_2 - n_1$ otherwise.

Since MPs involve taking the measure of abstract individuals in particular units (length in feet, age in years, etc.), we introduce a measure function, μ, defined in (34).

(34)   A measure function μ relativized to a class of unit *m* takes an individual *u* and a world w and returns a number *n* representing the measure of *u* in terms of *m*'s in w.

Suppose John received 100 points in the actual world @. Then in @, the result of applying μ_{points} to the points John received, written μ_{points}(points John received)$_@$, is 100. (35) is a first attempt at providing truth conditions for (31a).

(35)   [[John failed the exam by 20 points]](@) = 1 iff
John failed the exam in @ *and*
$\exists w$: R(@,w) [DIFF(μ_{points}(points John received)$_w$, μ_{points}(points John received)$_@$) = 20
& ¬John failed the exam in w]   *and*
$\forall w'$: R(@,w') [DIFF(μ_{points}(points John received)$_{w'}$, μ_{points}(points John received)$_@$) <
20 $\rightarrow$ John failed the exam in w']

Before developing a compositional semantics, let's check that we have got the truth conditions right. (35) says that 'John failed the exam by 20 points' is true just in case (i) John failed the exam; (ii) there is an accessible world w such that the difference between the number of points John received in w and the number of points he actually received is 20, and John passed the exam in that world, and (iii) in every accessible world w such that the difference between the number of points John received in w and the number of points he actually received is less than 20, John failed the exam. Suppose John needed at least 100 points to pass the exam, and scored 80 points – a scenario on which our example sentence is true. (i) holds in such a situation. (ii) also holds, since the only accessible worlds satisfying the first conjunct of the condition statement of the existentially quantified sentence are w_1, in which John scored 100 points, and w_2 where he scored 60 points. w_1 also satisfies the second

combine with a *by*-phrase. This research will shed further light on the semantics of the *by*-phrase; amendments to the current proposal will doubtless be needed. The semantics I propose seems adequate for Fijian comparatives, however.

conjunct, hence the condition specified by the existentially quantified sentence is satisfied. (iii) also holds, since any number of points less than 20 would fail to make a difference to whether or not John passed. We seem to be on the right track. The next step is to provide a semantics for expressions of form, *by n units*.

Notice that we merely helped ourselves to *points John received* as a suitable argument for μ. We can certainly improve on that. First, let the class of units to which the measure function is relativized be determined by the class of units mentioned in the *by*-phrase – points in the example we have been considering. Next, assume that the argument u of the measure function is a contextually salient individual with the properties described in (36). Under these assumptions, *points John received* is a suitable candidate value for u.

(36) i. $\mu_m(u)$ is defined (u can be measured in m's).
      ii. There is a contextually salient relation **R** which holds between u and the subject of the predicate that the *by*-phrase modifies.

While we're at it, let's also define the accessibility relation more precisely:

(37) $\forall w \forall w'$: $<w,w'> \in$ R iff w' is just like w except that $\mu_m(u)_w \neq \mu_m(u)_{w'}$
      where u is the contextually salient individual which meets the conditions in (36), and
m   identifies the units mentioned in the *by*-phrase.

We are now in a position to give a semantics for the *by*-phrase, (38), and to show how this semantics enables the correct truth conditions for (31a) to be derived (39).

(38) $[[$by n m's$]]^c_{<<e,st>,<e,st>>}=$
$\lambda P_{<e,st>} \lambda x_e \lambda w \in c.$ $P(x)(w) = 1$ & $\exists w'$: $R(w,w')$ $[\text{D\textsc{iff}}(\mu_m(u)_{w'}, \mu_m(u)_w) = n$ & $\neg(P(x)(w') = 1)]$
& $\forall w''$: $R(w,w'')$ $[\text{D\textsc{iff}}(\mu_m(u)_{w''}, \mu_m(u)_w) < n \rightarrow P(x)(w'') = 1]$

(39) $[[$by 20 points$]]^c =$
$\lambda P_{<e,st>} \lambda x_e \lambda w \in c.$ $P(x)(w) = 1$ & $\exists w'$: $R(w,w')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w'}, \mu_{points}(u)_w) = 20$ &
$\neg(P(x)(w') = 1)]$ & $\forall w''$: $R(w,w'')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w''}, \mu_{points}(u)_w) < 20 \rightarrow P(x)(w'') = 1]$

$[[$by 20 points (failed the exam)$]]^c =$
$\lambda x_e \lambda w \in c.$ failed the exam$(x)(w) = 1$ & $\exists w'$: $R(w,w')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w'}, \mu_{points}(u)_w) = 20$ & $\neg($failed the exam$(x)(w') = 1)]$ & $\forall w''$: $R(w,w'')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w''}, \mu_{points}(u)_w) < 20 \rightarrow$ failed the exam$(x)(w'') = 1]$

$[[$failed the exam by 20 points (John)$]]^c =$
$\lambda w \in c.$ failed the exam$(John)(w) = 1$ & $\exists w'$: $R(w,w')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w'}, \mu_{points}(u)_w) = 20$ & $\neg($failed the exam$(John)(w') = 1)]$ & $\forall w''$: $R(w,w'')$ $[\text{D\textsc{iff}}(\mu_{points}(u)_{w''}, \mu_{points}(u)_w) < 20 \rightarrow$ failed the exam$(John)(w'') = 1]$

$= \lambda w \in c.$ failed the exam$(John)(w) = 1$ & $\exists w'$: $R(w,w')$ $[\text{D\textsc{iff}}(\mu_{points}($points John received$)_{w'},$ $\mu_{points}($points John received$)_w) = 20$ & $\neg($failed the exam$(John)_{w'} = 1)]$ & $\forall w''$: $R(w,w'')$ $[\text{D\textsc{iff}}(\mu_{points}($points John received$)_{w''}, \mu_{points}($points John received$)_w) < 20 \rightarrow$ failed-the-exam$(John)(w'') = 1]$ (by (36))

The semantics applies straighforwardly to Fijian. Consider (23) again. We treat *e na dua na yabaki* ('by one year') as a predicate modifier whose semantics fits the template of that

given for English *by*-phrases in (38). (40) is a bottom-up derivation of the truth conditions of (23).

(40) $[[$by one year$]]^c_{<<e,st>,<e,st>>}$ =
$\lambda P \, \lambda x \, \lambda w \in c. \, P(x)(w) = 1 \, \& \, \exists w': R(w,w') \, [D_{IFF}(\mu_{years}(u)_{w'}, \mu_{years}(u)_w) = 1 \, \& \, P(x)(w') = 0] \, \& \, \forall w'': R(w,w'') \, [D_{IFF}(\mu_{years}(u)_{w''}, \mu_m(u)_w) < 1 \rightarrow P(x)(w'') = 1]$

$[[$by one year (old$_X$ *mai* Peter)$]]^c$
$= \lambda x \, \lambda w \in c.$ $\underline{U_c = \{x\} \cup Peter}$
          $[[old_X$ *mai* Peter(x)(w)$]]^c = 1 \, \& \, \exists w': R(w,w') \, [D_{IFF}(\mu_{years}(u)_{w'}, \mu_{years}(u)_w) = 1 \, \&$
          $\neg([[old_X$ *mai* Peter(x)(w')$]]^c = 1)] \, \& \, \forall w'': R(w,w'') \, [D_{IFF}(\mu_{years}(u)_{w''}, \mu_m(u)_w)$
          $< 1 \rightarrow [[old_X$ *mai* Peter(x)(w'')$]]^c = 1]$

$[[old_X$ *mai* Peter by one year$]]$(Mary)
$= \lambda c \, \lambda w \in c.$ $\underline{U_c = \{Mary, Peter\}}$
          $[[old_X$ *mai* Peter(Mary)(w)$]]^c = 1 \, \& \, \exists w': R(w,w') \, [D_{IFF}(\mu_{years}(u)_{w'}, \mu_{years}(u)_w) =$
          $1 \, \& \, \neg([[old_X$ *mai* Peter(Mary)(w')$]]^c = 1)] \, \& \, \forall w'': R(w,w'') \, [D_{IFF}(\mu_{years}(u)_{w''},$
          $\mu_m(u)_w) < 1 \rightarrow [[old_X$ *mai* Peter(Mary)(w'')$]]^c = 1]$

$= \underline{U_c = \{Mary, Peter\}}$
      $[[old_X$ *mai* Peter(Mary)(w)$]]^c = 1 \, \& \, \exists w': R(w,w') \, [D_{IFF}(\mu_{years}(Mary's \, age)_{w'}, \mu_{years}(Mary's$
      $age)_w) = 1 \, \& \, \neg([[old_X$ *mai* Peter(Mary)(w')$]]^c = 1)] \, \& \, \forall w'': R(w,w'') \, [D_{IFF}(\mu_{years}(Mary's$
      $age)_{w''}, \mu_m(Mary's \, age)_w) < 1 \rightarrow [[old_X$ *mai* Peter(Mary)(w'')$]] = 1]$

(23) is thus true just in case (i) Mary is older than Peter; (ii) if she were a year younger, she would not be older than Peter; and (iii) in every accessible world w' such that the difference between Mary's age in w'' and her actual age is less than a year, Mary is older than Peter. We have provided a semantics for differential MPs which makes no appeal to degrees; unlike Kennedy, we think that tolerance of differential MPs is no evidence against an SIC analysis.

6   The problems of crisp judgment contexts and implicatures

The problem of Fijian comparatives being felicitous in crisp judgment contexts can be rather more quickly dispensed with. The strategy will be to identify the property of English adjectives that renders SIC impossible in these contexts, and to explain that since this property is lacking in Fijian, the same issues do not arise for that language. The first step is provided by Kennedy (2007a); the second step is a natural consequence of the analysis we have proposed.

According to Kennedy (2009), the infelicity of SIC in crisp judgment contexts is due to the adjective combining with an operator *pos* whenever it appears in its positive (non-comparative) form. Kennedy's semantics for *pos* is reproduced as (41).

(41) $[[[_{Deg} pos]]] = \lambda g\lambda x.g(x) \geq s(g)$ (Kennedy 2007a)

'where *s* is a context sensitive function that chooses a standard of comparison in such a way as to ensure that the objects that the positive form is true of 'stand out' in the context of utterance, relative to the kind of measurement that the adjective encodes'.

According to Kennedy, the failure of SIC in crisp judgment contexts is failure of the standard of comparison given by the complement of *to* in *compared to* to possess the relevant property to a suficiently lesser degree from the subject so that the subject 'stands out'. Given our analysis, it is no surprise that the constraints imposed by the *pos* operator are absent from Fijian: in that language, adjectives do not combine with degree morphology, of which *pos* is an instance. It is therefore a virtue, rather than a drawback of the theory that Fijian fails the crisp judgments test.

Another pleasing aspect of our proposal is that it predicts that Fijian should pass the implicature test that it does pass, and that it should fail the implicature test that it does fail. Recall that we found that Fijian comparatives give rise to negative implicatures concerning the standard of comparison, but do not produce negative implicatures for the subject. This is just as we should expect: by the lights of our analysis, a sentence of form 'A is P *mai* B' asserts that A is P and communicates (by virtue of the meaning of *mai* and general principles governing the nature of comparison classes) that B is not P. It seems we have discovered some differences between SIC in a language with comparative morphology, and SIC in an SIC-only language.

7   Conclusions

It seems that there are indeed strong implicit comparison-only languages – that is, languages that lack degree morphology. Moreover, SIC is not limited to the conjoined comparative, but can also occur as a separative comparative. We close by asking what makes an SIC language.

We have already seen the beginnings of an answer to this question: the Degree Semantics Parameter of Beck et. al. stated in (24). One question that Beck et. al. do not address is how the child determines the correct setting of this parameter. I take it that the properties of SIC discussed here, which mostly concern truth conditions and usage conditions, are not well suited to this purpose. Here is a way of approaching the problem. Suppose that degree arguments of gradable predicates, and quantifiers over (sets of) degrees (comparative morphology), are generated in the syntactic position labelled Deg. A language that has predicates that take degree arguments – that is, a language that has the positive setting of the DSP – will have syntactic material that occupies Deg. A language that has the negative setting of the DSP will not, which is just to say that Deg will not be projected. I take it that the presence of particular types of material constitutes a better basis on which to set a parameter than the absence of such material. Hence the default setting for the DSP will be the negative one. The parameter will be set positively just in case items occupying Deg (degree arguments or quantifiers over degrees) are encountered in the language. One prediction of this view is that any language that is not a strong implicit comparision language will have some overt material occupying Deg. If Japanese is a WIC language which employs a covert item meaning *more*, we will have to search beyond the comparative of superiority to find such overt material. The superlative seems to be the place to look: Aihara (2009) gives

an analysis of the Japanese superlative based on the assumption that *ichiban* is the Japanese counterpart of *–est*. Encountering a superlative morpheme might then be what tells the child that she is learning Japanese and not Fijian.

Another issue raised by the DSP is that it commits us to the view that there is cross-linguistic variation in the type assigned to lexical items of the same syntactic category. This idea is not without precedent: Chierchia (1998) proposes that different languages have different options concerning the type(s) to which nouns are mapped. It is worth noting, however, that our analysis of Fijian is compatible with a more conservative view whereby the locus of variation is confined to the syntactic component. The relevant parameter is stated in (43).

(43) *Degree Head Parameter*
      A language {does/does not} have the functional category Deg.

Locating the variation we find in the Degree Head Parameter would require a qualification of our proposal that gradable predicates in Fijian have a different type from that usually assigned to the corresponding English items in the semantic literature. Kennedy (2007b) provides a response to this challenge: gradable predicates are of the same type cross-linguistically, with no degree argument even for English. Degree arguments are introduced via type-shifting operations that come about as a consequence of the presence of degree morphology – items occupying Deg. Once again, the default setting of the parameter is negative; the child only sets the parameter positively if she encounters material occupying Deg. A correlation between the presence of Deg, the presence of degree morphology, and the availability of degree arguments in a given language is thereby maintained. We end then with a choice between locating variation in syntax and locating it in semantics. Since both possibilities seem to be compatible with the proposal described in this paper, I leave it to future research on a broader range of languages to determine the exact nature of the parameter responsible for cross-linguistic variation in the availability of comparative morphology.

Acknowledgements

References

Aihara, Masahiko (2009) "The scope of –est: evidence from Japanese", *Natural Language Semantics* **17**, 341-367.

Beck, Sigrid, Toshiko Oda, and Koji Sugisaki (2004) "Parametric variation in the semantics of comparison: Japanese vs. English", *Journal of East Asian Linguistics* **13**, 289-344.

Beck, Sigrid (2009) Handouts for 'Topics in Semantics', MIT.

Beck, S., Krasikova, S., Fleischer, D., Gergel, R., Hofstetter, S., Savelsberg, C., Vanderelst, J., Villalta, E. (forthcoming) "Crosslinguistic Variation in Comparison Constructions", in Van Craenenbroeck, J. (ed.), *Linguistic Variation Yearbook 2009*.

Kennedy, Christopher (2007a) "Vagueness and grammar: the semantics of relative and absolute gradable adjectives", *Linguistics and Philosophy* **30**, 1-45.

Kennedy, Christopher (2007b) "Standards of Comparison", Handout for the Colloque de Syntaxe et Sémantique à Paris.

Kennedy, Christopher (2009) "Modes of Comparison", in Elliott, M., J. Kirby, O. Sawada, E. Staraki and S. Yoon (eds.), *Papers from the 43rd Annual Meeting of the Chicago Linguistics Society*, 141-165.

Klein, Ewan (1980) "A Semantics for Positive and Comparative Adjectives", *Linguistics and Philosophy* **4**, 1-45.

Klein, Ewan (1991) "Comparatives", in von Stechow, A. and D. Wunderlich (eds.), *Semantics: An International Handbook of Contemporary Research*, Berlin/New York: Walter de Gruyter, 673-691.

Oda, Toshiko (2008) *Degree constructions in Japanese.* Phd dissertation, UConn.

Pearson, Hazel (2009) "On the semantics of the Fijian comparative". Ms., Harvard University.

Pearson, Hazel (in preparation) "On the presence of adjectives in Fijian and the universality of the category ' adjective'", in preparation for *Proceedings of Austronesian Formal Linguistics Association XVII*.

Sauerland, Uli (2005) "Don't interpret focus! Why a presuppositional account of focus fails and how a presuppositional account of givenness works", in Maier, E., C. Bary & J. Huitink (eds), *Proceedings of Sinn und Bedeutung 9*, 370-384.

Sawada, Osamu (2009) "Pragmatic aspects of implicit comparison: an economy-based approach", *Journal of Pragmatics* **41**, 1079-1103.

Schwarzschild, Roger (2008) "The Semantics of Comparatives and other Degree Constructions", *Language and Linguistic Compass* **2**, 1-24.

Stassen, Leon (2008) "Comparative Constructions", in Haspelmath, M., M. Dryer, S. Matthew, D. Gil, and B. Comrie (eds.), *The World Atlas of Language Structures*, Oxford

University Press, 490-493.

Vander Klok, Jozina (to appear) "Indirect modification in Javanese: evidence from attributive comparatives", to appear in *Papers from the 45th Annual Meeting of the Chicago Linguistics Society.*