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Adjectives. Formal analyses in syntax and semantics
Edited by Patricia Cabredo Hofherr and Ora Matushansky

Adjectives

Formal analyses in syntax and semantics

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Comparisons of similarity and difference

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The present paper proposes an analysis of comparisons of similarity and difference in English involving *different*, *same* and *like*. First, I examine the relationship between comparisons involving *different*, *same* and *like* and scalar comparisons exemplified by *I am taller now than I used to be*. Since both constructions differ only on a few points, I conclude that comparisons of similarity and difference should be analyzed as a subclass of comparative constructions. The second part of the paper analyzes the scope of comparisons of similarity and difference: I argue that these comparisons are best analyzed as comparisons between sets of properties.

1. Introduction

This paper examines certain constructions involving *different*, *same*, and *like*, such as those seen in (1).

- (1) a. I am different now than I used to be.
- b. I am the same now as I used to be.
- c. I am still a great deal like I used to be.

I use the term “comparisons of similarity and difference” to refer to the underlined phrases in (1), since informally, each example can be described as asserting that some amount of similarity or difference holds between my current state and some previous state of mine. Comparisons of similarity and difference have not received a great deal of attention from linguists, save for the occasional mention of their affinity to scalar comparisons. I use the latter term to refer to well-studied comparative constructions like those seen in (2).

- (2) a. I am taller now than I was before.
- b. I am as happy now as I was before.

My investigation of comparisons of similarity and difference is organized around two questions. First, what is the extent of the affinity between such comparisons and “ordinary” scalar comparisons? This question is my concern in Section 2, where I show that comparisons of similarity and difference in fact possess a great many of the characteristic

features of scalar comparisons. The affinity between the two types of comparison is thus quite large, and justifies the view that the constructions in (1) should ultimately be analyzed as comprising a distinct subclass of comparative constructions. Second, what are comparisons of similarity and difference comparisons between? This question is my concern in Section 3; the answer that I argue for there is that such comparisons are best understood as comparisons between sets of properties. Before arriving at this answer, I first consider, and eventually reject, two alternative answers, namely that such comparisons are either comparisons between individuals, or else comparisons between (sets of) degrees. In the remaining sections of the paper, I develop a formal semantic analysis of comparisons of similarity and difference based upon the notion that these constitute comparisons between sets of properties (Section 4), and investigate some of the further issues that arise from this approach (Section 5). Section 6 contains a brief conclusion.

2. Two kinds of comparison compared

The observation that comparisons of similarity and difference bear some resemblance to scalar comparisons is certainly not a novel one. For instance, it has often been noted about *different* and *same* that these govern complements introduced by *than* and *as*, a characteristic feature of the scalar comparison heads *more/-er*, *less*, and *as*. In the syntactic literature on comparative constructions, one also finds occasional reference to properties of scalar comparative constructions that are shared by those involving *different*, *same*, and *like*, particularly in the realms of complementation and modification (see Sections 2.2 and 2.3 for references). In fact, the parallelism between the two runs very deep, much more so than has been previously recognized, and it is the purpose of this section to demonstrate the extent of this parallelism. Doing so also provides an opportunity to introduce much of the data that I take as relevant to the semantic analysis of comparisons of similarity and difference, as well as some initial motivation for analogizing their semantics to that of scalar comparisons.

2.1 External distribution

Consider first the external distributions of scalar comparisons and those of similarity and difference. Broadly considered, these appear in the same range of syntactic positions and perform the same range of grammatical functions. Both types of comparisons may function (i) predicatively, after copular *be* and as the complements of verbs like *sound*, *look*, and *act*, (ii) attributively, as NP-internal modifiers, and (iii) adverbially, in unselected positions and as the complements of verbs like *word*,

treat, and *behave*.¹ Each of these possibilities is respectively illustrated by the (a)-, (b)-, and (c)-examples in (3)–(6).^{2,3}

- (3) a. John is **crazier** than I expected him to be.
 b. Lou drives a **faster** car than Mary does.
 c. You should word your letter **as carefully** as I worded mine.
- (4) a. Paul's voice sounds **different** than it did before.
 b. These days, the Macworld conference attracts a **different** audience than it did in the past.
 c. The press has treated Arnold **differently** than they've treated Sean Penn or Barbra Streisand for expressing their political views.
- (5) a. George looks **the same** as he did the last time I saw him.
 b. The Mercury Gran Marquis is **the same** car as the Ford Crown Victoria, only sold under a different name.
 c. Once the bumblebees acclimated to the habitat, they behaved **the same** as they would in a natural environment.
- (6) a. Ringo's friend acted just **like** I thought he would—a lot of passion and little class.
 b. Our citizens need to be informed about how to vote properly so that we don't have problems **like** there were in Florida.
 c. I read Roger Ebert's column because the man writes **like** I speak.

1. Both comparisons can also function appositively, as in (i) and (ii).

- (i) As tall as he is, John still can't reach the top shelf.
 (ii) John, like Bill, was also interrogated by the FBI.

Also of interest are such uses of *like* as in (iii), where it combines with a structurally complete clause and alternates with *as if* and *as though*.

- (iii) It sounds {like, as if, as though} you don't want to be my girlfriend anymore.

The structure and interpretation of these constructions is beyond the scope of this paper.

2. Many of the examples in this paper were culled from the Internet using the Google search engine. For the most part, I do not distinguish attested examples from invented ones.

3. While the appearance of the definite article with NP-internal *same* in (5b) is not surprising, its appearance in (5a) and (5c) is, given the absence of an overt nominal head. Throughout this paper, I will treat the definite article when appearing with predicative and adverbial uses of *same* as if it were contentless, though this seems unlikely to be correct. Exactly what licenses its appearance here is something that I do not presently understand.

Note that in its attributive guise, *like* must occur postnominally, unlike *different* and *same* (compare (6b) to (4b) and (5b)).

2.2 Complement structures

It has been observed in various places that there is a striking parallelism between the complements that occur in scalar comparisons and those of similarity and difference. In fact, the two types of comparison permit nearly identical ranges of complement structures. Nonetheless, there is also an important difference in their complementation possibilities, which, to the best of my knowledge, has so far gone unnoticed. In Section 2.2.1 below, I review the complementation parallels between the two types of comparison, while Section 2.2.2 addresses the difference that exists between them.

2.2.1 Complementation parallels

Both scalar comparisons and those of similarity and difference can occur with either nominal or clausal complements (Huddleston & Pullum 2002: sect. 13.5, Jackendoff 1977: sect. 8.3). These possibilities are respectively illustrated by the (a)- and (b)-examples in (7)–(10).

- (7) a. Chris is as tall as Bill.
b. Chris is taller than Bill is.
- (8) a. The book of Deuteronomy is different {than, from} the previous books.
b. College is different than I expected it to be.
- (9) a. I feel the same as you about Barbie!
b. The place looks the same as it looked a half century ago.
- (10) a. The groundhog is like most other prophets: it delivers its prediction and then it disappears.
b. I certainly tried to act like I thought he would act.

Notice that whereas *like* governs its complements directly, the relations between *different* and *same* and their complements are respectively mediated by *than* and *as*. When *different* occurs with a nominal complement, the preposition *from* alternates with *than*.

Each of the clausal complements in the (b)-examples above contains a gap in a position normally occupied by a property-denoting term (cf. *Bill is *(tall)*, *I expected college to be *(boring)*, *This place looks *(familiar)*, *Please try to act *(happy) when the chancellor visits*). Another parallel between the two types of comparison is that in both, the position of this gap is island-sensitive.

- (11) *Chris is taller than I wonder whether Bill is.
- (12) a. *College is different than I wondered whether it would be.
b. *The place looks the same as I met a man who said it looked.
c. *I tried to act like I heard a rumor that she wants her students to act.

Furthermore, the clausal complements of both types are subject to the same kinds of additional reduction. In each example below, a verb phrase is missing from the clausal complement; (13a) and (e.g.) (14a) are interpreted as synonymous with the unreduced *Chris looks as happy as I expected him to look* and *Paul's voice sounds different than it sounded before*.

- (13) Chris looks as happy as I expected him to.
- (14) a. Paul's voice sounds different than it did before.
b. George looks the same as he did the last time I saw him.
c. Do you feel like I do?

The following examples show that even an entire embedded clause be omitted; (15a) and (e.g.) (16a) are interpreted as synonymous with the unreduced *Chris turned out to be taller than I had previously suspected that he was* and *The book turned out much differently than I had thought it would turn out* (Huddleston & Pullum 2002: sects. 13.2.1, 13.5).

- (15) Chris turned out to be taller than I had previously suspected.
- (16) a. The book turned out much differently than I had thought.
b. I had used some invalid syntax that just happened to do the same as I intended on my test data.
c. Martin sounded nothing like I expected—but then again, hardly anyone looked or sounded like I expected.

The sort of reduction seen in (15) and (16) is particularly noteworthy, since unlike verb phrase ellipsis, which is plausibly involved in (13) and (14), the possibility of omitting an entire embedded clause appears to be a unique feature of comparative constructions. In other contexts which allow for verb phrase ellipsis, the clausal complements of *suspect*, *think*, *intend*, and *expect* cannot go entirely unexpressed.⁴

4. There are of course verbs for which examples like (17d) are acceptable:
- (i) I won the Nobel Prize!
–I {know, remember, can tell}.

The phenomenon illustrated in (i) is known in the literature as Null Complement Anaphora. Moltmann (1993) observes that the class of verbs that permit Null Complement Anaphora is not coextensive with the class of verbs that permit their clausal complements to go unexpressed in comparative constructions; the examples in the text, as well as the contrast between (i) and (ii), support her observation.

- (ii) a. *Chris turned out to be taller than I had previously known.
b. *The book turned out differently than I could tell.

I follow Moltmann in assuming Null Complement Anaphora to be distinct from the phenomenon illustrated in (15) and (16).

- (17) a. If Andrew knows what's best for him, he'll call his girlfriend right now.
 -I suspect *(that he will).
 b. He said everything that I thought *(that he would).
 c. Unfortunately, I forgot to post your bail, but I intended *(to).
 d. I won the Nobel Prize!
 -I expected *(that you would).

If this restriction to comparative constructions indeed holds, then the facts in (16) provide a strong argument for taking constructions involving *different*, *same*, and *like* to constitute a kind of comparative construction.

2.2.2 An important difference

As I pointed out above, there is an important difference in the complementation possibilities found with scalar comparisons and those of similarity and difference. Alongside examples like (7b), where the gap within the clausal complement replaces a property-denoting term, one also finds scalar comparisons with so-called "sub-deletion" complements, where the gap occurs in a position normally occupied by a degree term.

- (18) a. The table is **as long** as it is wide.
 b. *The table is **as long** as it is {very, somewhat} wide.

That the clausal complement in (18a) contains a gap is demonstrated by the unacceptability of (18b), where an overt degree expression appears before *wide*.

The following examples show that subdeletion complements are apparently impossible in comparisons of similarity and difference.

- (19) a. *Deuteronomy is **different** than the other books are interesting.
 b. *This place is **the same** as it was beautiful a half century ago.
 c. *Ringo is a lot **like** I am happy.

The generalization is thus the following one: whereas the smallest possible gap in clausal complements of (predicative) scalar comparisons is one that corresponds to a degree term, the smallest possible gap in clausal complements of (predicative) comparisons of similarity and difference is one that corresponds to a property-denoting term.

2.3 Modifiers

Modification facts also support the view that the two types of comparison are closely related. Since the modifiers of *different* and *like* differ significantly from those of *same*, I address these separately in Sections 2.3.1 and 2.3.2 below. Also, this discussion of *different* and *like* covers only one aspect of their modification possibilities; another set of modifiers is addressed in Section 5.2.

2.3.1 Modifiers of different and like

Amongst the modifiers that occur in scalar comparisons of inequality, there is a class whose members provide some measure of the disparity that exists between the compared items. Belonging to this class are the modifiers *much*, *a lot*, *a great deal*, *no*, (negative polarity) *any*, and *little*.

- (20) a. Chris is {much, a lot, a great deal} **happier** than I expected him to be.
 b. I'm {no, not any} **more intelligent** now than I was before.
 c. The race takes place on a strip that in some places is little **wider** than an old-fashioned, two-lane U.S. highway.

The examples in (21) show that the overall distribution of these modifiers is restricted so that they cannot occur with simple gradable adjectives.

- (21) a. *Chris is {much, a lot, a great deal} happy.
 b. *I'm {no, not any} intelligent.
 c. *The race takes place on a strip that in some places is little wide.

These modifiers do, however, occur with *different* and *like* (Bresnan 1973: 278 fn. 4, Huddleston & Pullum 2002: sect. 13.5). Interestingly, with *like* one finds *nothing* and *anything* instead of *no* and *any*.

- (22) a. My leadership role will be {much, a lot, a great deal} **different** than it was last year.
 b. I'm {no, not any} **different** than I used to be.
 c. Many professing Christians are practicing shameful lifestyles that are little **different** than those of unbelievers.
- (23) a. Behind the scenes, she's {much, a lot, a great deal} **like** she is on the air.
 b. I'm {nothing, not anything} **like** I used to be.
 c. The character that Kevin Sorbo plays is little **like** the Hercules of Greek mythology. To help make Hercules acceptable for present day audiences, the filmmakers remade the character in a present day image.

The facts in (22) and (23) show that despite their status as simple adjectives (or perhaps preposition, in the case of *like*; see Maling 1983), *different* and *like* nonetheless demonstrate an affinity to the morphosyntactically complex heads of scalar comparisons.

2.3.2 Modifiers of same

With *same*, one finds a different group of modifiers, including *nearly*, *almost*, *roughly*, *not quite*, and *just about* (Huddleston & Pullum 2002: sect. 13.5).

- (24) a. The 1999 model is {nearly, almost, roughly} **the same** car as the 1998 is, except for a few minor changes with little or no effect on power.
 b. Frozen fish isn't quite **the same** as fresh fish.
 c. I go through my day just about **the same** as anyone else does, the only difference is the testing of my blood sugar and my shots.

Here, the proper parallel is to scalar equative comparisons, where one also finds these modifiers (*op. cit.*).

- (25) Chris is {nearly, almost, roughly, not quite, just about} as tall as I expected him to be.

2.4 Negative polarity item licensing

A well-known fact about scalar comparisons is that negative polarity items (NPIs, Ladusaw 1980) are licensed in their clausal complements. The examples in (26) show that this is the case for both scalar comparisons of inequality as well as scalar equative comparisons.

- (26) a. I'm **stronger** now than I've ever been before.
 b. My urge to steal was **stronger** than I could help.
 c. Her mind is as **quick** as it ever was.
 d. Jim is as **competent** as anyone here could possibly be.

What about comparisons of similarity and difference? Given the parallelism observed so far, we would expect NPIs to also be licensed in the clausal complements of *different*, *same*, and *like*. For the most part, this expectation is borne out, though the facts here are a bit complicated.

Beginning with clausal complements of *different*, the NPIs *any* and *ever* are amply attested here; two examples are given in (27a) and (27b). Other NPIs can also be found in this context, though it must be admitted that their occurrences are rather more scarce. Attested examples of the NPIs *care to V* and *can possibly* occurring in clausal complements of *different*(ly) are given in (27c) and (27d). Example (27e), involving the NPI *bother to V*, is invented, but strikes me as comparable in its acceptability to the others.

- (27) a. I decided that we were going to do it **differently** than anyone else had done it before.
 b. I felt **different** than I ever had before.
 c. You may do things **differently** than I care to do them. Are you right or am I right? Neither of us is right or wrong...this is the computer field.
 d. We reached Marseilles at last, and it was far **different** than we could possibly have imagined.
 e. Unfortunately, the exam covered **different** material than I had bothered to study.

Turning to clausal complements of *same*, certainly the NPIs *any* and *ever* are licensed here, as the attested examples in (28) illustrate.

- (28) a. I go through my day just about **the same** as anyone else does, the only difference is the testing of my blood sugar and my shots.
 b. Robin's been belting out those classic Cheap Trick tunes for a quarter-century and sounds **the same** as he ever did!

Interestingly, I've yet to uncover attested instances of any other NPI in this context; this is a curious asymmetry between *different* and *same* that will go unaccounted for here.⁵

The facts surrounding *like* are more straightforward: NPIs do not appear to be licensed in its clausal complements at all. Some minimal contrasts that demonstrate this are given in (29).

- (29) a. I decided that we were going to do it **like** {we, everyone else, *anyone else} had done it before.
 b. I felt **like** I {always, once, *ever} had before.
 c. We reached Marseilles at last, and it was a lot **like** we {had, *could possibly have} imagined.
 d. You may do things **like** I {prefer to, *care to} do them.

One does find instances of *any* in clausal complements of *like*, as in (30a), but these seem quite clearly to be instances of free choice *any*. Observe, for example, that the omission of the modal *would* from the clausal complement in (30b) leads to unacceptability, in contrast to what is observed in (30c) for the ordinary universal NP *every other candidate*.

- (30) a. Kerry reacted to the allegations **like** any other candidate would have.
 b. *Kerry reacted to the allegations **like** any other candidate has.
 c. Kerry reacted to the allegations **like** every other candidate {would have, has}.

This is no different from the pattern displayed by free choice *any* elsewhere (Carlson 1981).

5. A reviewer asks whether the occurrences of *any* and *ever* in (28) are not in fact Free Choice Items, observing that they are interpreted universally in these examples. Note, though, that *any* and *ever* also receive universal interpretations when they occur in scalar comparisons:

- (i) Max is taller than anyone expected him to be. ≈
 Max is taller than everyone expected him to be.
 (ii) Her mind is as quick as it ever was. ≈
 Her mind is (at least) as quick as it was at all times in the past
 (where the quickness may vary across past times).

For recent discussion of this fact, see Zepter 2003.

- (31) a. Any other candidate would have reacted similarly.
 b. *Any other candidate has reacted similarly.
 c. Every other candidate {would have, has} reacted similarly.

In summary, the parallelism between scalar comparisons and those of similarity and difference is partially supported by the NPI facts seen here. NPIs are licensed in the clausal complements of *different* and *same* (though the range of NPIs licensed in the latter context is quite restricted), but not in the clausal complements of *like*.

2.5 Sensitivity to “negative” expressions in clausal complements

Scalar comparisons and those of similarity and difference are both sensitive to the presence of negation and other downward monotone expressions in their clausal complements.

- (32) a. Chris is **taller** than John said he is.
 b. *Chris is **taller** than John denied he is.
- (33) a. College is a lot **different** than I thought it would be.
 b. *College is a lot **different** than I doubted it would be.
- (34) a. I think that I feel **the same** as everyone else does.
 b. *I think that I feel **the same** as no one else does.
- (35) a. Duncan looks a lot **like** I do before my first cup of coffee.
 b. *Duncan looks a lot **like** I don't before my first cup of coffee.

In each of (32)–(35), the only difference is the presence of a downward monotone expression in the (b)-example where it does not occur in the (a)-example. The (a)-examples are uniformly acceptable, while the (b)-examples are entirely unacceptable.

2.6 *De re/de dicto* ambiguities

Finally, both types of comparison give rise to certain ambiguities when they occur in intensional contexts, such as the clausal complements of verbs like *think*, *say*, and *realize*. Russell (1905) famously observed that (36) is ambiguous between a “mistaken” reading, under which I merely possess an incorrect belief about the yacht's size, and a “contradictory” reading, under which my belief about the yacht's size is necessarily false.

- (36) I thought that your yacht is **longer** than it is.

Since von Stechow (1984a), most work on scalar comparisons has followed Russell in taking this ambiguity to reflect the possibility of either a *de re* or a *de dicto* interpretation of the clausal complement *than it is* with respect to the intensional verb *think*.

De re/de dicto ambiguities can also be detected for comparisons of similarity and difference when these occur in intensional contexts. Consider first *different* and *like*.

- (37) Mary thinks that John sounded **different** than he did.
 (38) My parents don't realize that I feel **like** I do.

The ambiguity of (37) mimics exactly that of (36); the example permits a “mistaken” reading, under which Mary merely possesses an incorrect belief about John's voice, and a “contradictory” reading, under which Mary's belief about John's voice is necessarily false. The readings associated with (38) involving *like* are of a different sort, though the ambiguity is no less striking. The example is ambiguous between an “inattentive” reading, under which my parents are unaware of my actual emotional state, and a “logically challenged” reading, under which they are unaware of a tautology (namely, the proposition that I feel like I do). In each of (36)–(38), the pragmatically bizarre reading reflects a *de dicto* interpretation of the clausal complement.

Turning to *same*, here one finds that, somewhat mysteriously, examples parallel to (37) and (38) are marginal.

- (39) a. ?Mary thinks that John sounded **the same** as he did.
 b. ?My parents don't realize that I feel **the same** as I do.

Although I have no account for the reduced status of the examples in (39), it is in the end harmless for our purposes, since the ambiguity in question is not tied to the presence of a pragmatically bizarre reading. Example (40) is also ambiguous between a *de re* reading and a *de dicto* one, albeit in a subtler fashion.

- (40) Bill said that John looked **the same** as I expected him to.

Under one reading, Bill need not have made any reference to my expectations in his utterance, while under the other, he must have made some such reference. Here, the latter reflects a *de dicto* interpretation of the clausal complement.

3. What are comparisons of similarity and difference comparisons between?

Having illustrated many of the ways in which comparisons of similarity and difference resemble scalar comparisons, let me now take up the issue of what exactly these are comparisons between. My answer to this question is provided in Section 3.3, where I propose that comparisons of similarity and difference constitute comparisons between sets of properties. Before considering the merits of this proposal, however, it will be worthwhile to consider two alternative views that might suggest themselves from the literature, namely that such comparisons constitute comparisons between individuals, or else comparisons between (sets of) degrees. I explore these alternatives, as well as the problems they face, in Sections 3.1 and 3.2.

3.1 Comparison of individuals

The first possibility to consider is that comparisons of similarity and difference constitute comparisons between individuals.

3.1.1 Background

This idea derives from a substantial body of work investigating certain uses of *different* and *same* that will not be considered in this paper, namely those illustrated in (41) (see, e.g. Dowty 1985; Heim 1985; Carlson 1987; Moltmann 1992; Beck 2000; Barker 2007).

- (41) a. Every student read a **different** book.
b. **The same** salesman sold me these two magazine subscriptions.

In these examples, *different* and *same* do not occur with complements. Each example permits (at least) two readings: under one of them, what is asserted by (e.g.) (41a) is that every student read a book that is different from some particular contextually salient book, while under the other, the assertion is that every student read a book that is different from a book read by any other student. Carlson (1987) aptly characterizes the latter sort of reading as one in which “the sentence, in some way or other, provides its own context” (p. 532), and it is the possibility of such readings that the above-mentioned analyses are concerned with. Although these analyses vary greatly in their approaches, there are two assumptions that consistently run through them. The first is that *different* and *same* respectively express non-identity and identity, while the second is that what *different* and *same* ultimately evaluate for (non-)identity are individuals.

3.1.2 Evaluation

It is reasonable to ask whether these assumptions should be extended to all uses of *different* and *same*, including the simple predicative uses shown in (42). The most straightforward way of doing this yields the meanings given in (43) and (44) (see Beck 2000: 109 for a version of (43)).

- (42) a. My new car is **different** {than, from} my previous one.
b. Water is **the same** as H₂O.

$$(43) \textit{different} = \lambda x_e \lambda y_e . x \neq y$$

$$(44) \textit{same} = \lambda x_e \lambda y_e . x = y$$

Under this view, *different* and *same* are simply relational adjectives; the relations that they denote are non-identity and identity between two individuals.

Appealingly simple though this view is, the data in Section 2 present it with several (in my view) insurmountable problems. First, *different* and *same* often combine with complements that do not appear to denote individuals. Two such complements occur in (45).

- (45) a. The final result may end up **different** than anyone imagined it to be.
b. The place looks **the same** as it looked a half century ago.

Exactly which individuals would be denoted by the phrases *than anyone imagined it to be* and *as it looked a half century ago* is not at all clear. A further problem is that the gap in (45b) occurs in a position that cannot ordinarily be occupied by an individual-denoting term (cf. **Lou looked George the last time I saw him*), preventing a straightforward analysis of the complement in terms of the iota operator.

Second, the modification possibilities of *different* and *same* are not easily accommodated by this view. Non-identity and identity between two individuals, at least as represented in (43) and (44), are not relations that can hold to varying extents, but the modifiers of *different* and *same* appear to specify just such an extent.

- (46) a. My new car is {much, a great deal, little} **different** than my previous one (was).
b. My new car is {almost, nearly, not quite, just about} **the same** as my previous one (was).

In (46), *much*, *little*, *almost*, *just about*, etc. provide some specification of the extent of the similarity or difference between my new car and my previous one. Without further elaboration, the meanings in (43) and (44) provide no way of understanding the semantic contribution of these modifiers.

A third problem is that sentences of the form *a is no different than b* should invariably be false when *a* and *b* denote distinct individuals. Given the proper context, however they need not be taken as such. Consider, for example, the passages in (47).

- (47) a. People are really no different than computers. We take input (our perception), react, process input, and retain memory.
b. Humans are animals, and in this respect we are no different from the rest: we are bodies, with brains, and a world to interact with.

Surely the individuals denoted by *people* and *computers* in (47a), and by *we* and *the rest* in (47b), are distinct individuals, but it would nonetheless be inappropriate for a listener to reject the sentences as false on these grounds.

Finally, this view of *different* and *same* posits a simple binary opposition between the two. Such a position leaves no room to relate these to *like*, leaving it a mystery why the three should pattern as closely as they do. It also provides no account for why *different* and *like* should enter into any logical relations. To see that they do, consider the valid equivalences in (48).

- (48) a. Oranges are more **different** from pears than apples are. \Leftrightarrow Apples are more **like** pears than oranges are.
b. English is more **different** from ASL than it is from Spanish. \Leftrightarrow English is more **like** Spanish than it is like ASL.

Generally, a sentence of the form *a is more different from b than a is from c* is true just in case the corresponding sentence *a is more like c than a is like b* is also true. This suggests that there should be some close relation between the meanings of *different* and *like*, but from the one given in (43) for *different*, it's not clear what this relation would be.

I conclude, then, that there are many uses of *different* and *same* that simply cannot be characterized as relations between individuals.

3.2 Comparison of (sets of) degrees

The next possibility to consider is that comparisons of similarity and difference constitute comparisons between degrees, or sets of degrees.

3.2.1 Background

The notion of degree that is relevant here comes from an approach to the semantics of gradability and scalar comparison that has been pursued in Seuren (1973), Cresswell (1976), von Stechow (1984a,b), Seuren (1984), Rullman (1995), Kennedy (1999), Heim (2000), Kennedy & McNally (2005), and many other works. The guiding intuition behind this approach is that gradable adjectives such as *tall* or *wide* are associated semantically with measurable concepts, e.g. "length". Such measurable concepts are formalized in terms of scales, where a scale is a linearly ordered set of points, or degrees. The term "degree" is meant to capture the intuition that each point on the scale represents a different degree to which the measurable concept can be realized. For instance, the scale illustrated in (49) serves as a formalization of the concept "length", where the degree d_k represents a larger measure of length than either of the degrees d_j or d_p by virtue of its being ordered ahead of them on the scale.

$$(49) \text{ LENGTH: } \emptyset \text{ --- } d_i \text{ --- } d_j \text{ --- } d_k \text{ --- } > \infty$$

Gradable adjectives are then taken to locate individuals along their associated scales, so that they generally denote relations between degrees and individuals. The gradable adjectives *tall* and *wide*, for instance, denote the relations in (50).

- (50) a. *tall* = $\lambda d_d. \lambda x_e. x$ is tall to (at least) degree d
 b. *wide* = $\lambda d_d. \lambda x_e. x$ is wide to (at least) degree d

The scalar comparison heads *more/-er*, *less*, and *as* in turn denote relations between degrees, or sets of degrees. One version of the latter view (see Heim 2000) assumes the "at least"-denotations for gradable adjectives given in (50), and assigns as the meaning of *more/-er* the proper subset relation between two sets of degrees.

$$(51) \text{ more/-er} = \lambda P_{\langle d,t \rangle}. \lambda Q_{\langle d,t \rangle}. P \subset Q$$

The first argument of *more/-er* (P) is provided by its clausal complement, which is interpreted as a set of degrees. The other argument (Q) is provided by the matrix

clause, which occurs within the scope of *more/-er* in the logical representation of a scalar comparison; it too is interpreted as a set of degrees.

To see how these assumptions come together in the analysis of a scalar comparison, consider (52a), which receives the logical representation in (52b).

- (52) a. The door is taller than it is wide.
 b. $-er(\lambda d_d. \text{the-door-is-}d\text{-wide})(\lambda d_d. \text{the-door-is-}d\text{-tall})$
 c. $\{d: \text{the door is at least } d\text{-wide}\} \subset \{d: \text{the door is at least } d\text{-tall}\}$

(53) LENGTH: $\emptyset \text{ --- } > \infty$
 DOOR'S HEIGHT: $\text{ --- }] = \{d: \text{the door is at least } d\text{-tall}\}$
 DOOR'S WIDTH: $\text{ --- }] = \{d: \text{the door is at least } d\text{-wide}\}$

The comparison head *-er* takes scope over its matrix clause in (52b); the latter denotes the set of degrees representing the door's height. The other argument is provided by the denotation of the clausal complement *than it is wide*, which is also a set of degrees, this time representing the door's width. The example is true just in case the second set is a subset of the first; as shown in (53), this corresponds to just those cases where the door's height is greater than its width.

Under this view, clausal subdeletion complements are in some sense most "transparent" semantically, since their degree-sized gaps are an accurate reflection of their interpretation as sets of degrees. The interpretation of complements exhibiting larger gaps, as in (54a), requires some amount of divergence from what is present in the overt syntax; note that the interpretation of the gradable adjective *tall* enters into the logical representation (54b) twice, though it appears overtly only once in (54a).

- (54) a. John is taller than Bill is.
 b. $-er(\lambda d_d. \text{Bill-is-}d\text{-tall})(\lambda d_d. \text{John-is-}d\text{-tall})$
 c. $\{d: \text{Bill is at least } d\text{-tall}\} \subset \{d: \text{John is at least } d\text{-tall}\}$

(55) LENGTH: $\emptyset \text{ --- } > \infty$
 JOHN'S HEIGHT: $\text{ --- }] = \{d: \text{John is at least } d\text{-tall}\}$
 BILL'S HEIGHT: $\text{ --- }] = \{d: \text{Bill is at least } d\text{-tall}\}$

The mismatch between the syntactic form of (54a) and the logical representation in (54b) is typically resolved by the postulation of some process of syntactic reduction (e.g. ellipsis) or semantic reconstruction.

3.2.2 Evaluation

Given the numerous parallels between scalar comparisons and those of similarity and difference that were identified in Section 2, it is certainly plausible that the latter should also constitute comparisons between sets of degrees. *Different*, *same*, and *like* would

then denote relations between sets of degrees, and their clausal complements would in turn denote sets of degrees. There are, however, certain revealing differences between the two types of comparison. These differences ultimately argue against extending a degree-based semantics to comparisons of similarity and difference.

First, perhaps the most salient difference between the two types of comparison is that *different*, *same*, and *like* do not combine with gradable adjectives, unlike their scalar counterparts *more/er*, *less*, and *as*.

- (56) a. Barry is **stronger** now than he used to be.
 b. John is **less intelligent** than I imagined he would be.
 c. I'm as **tall** now as I was when I was in college.
- (57) a. Barry is (*strong) **different** (*strong) now than he used to be.
 b. John is (*intelligent) **the same** (*intelligent) as I imagined he would be.
 c. I'm (*tall) **like** (*tall) I was when I was in college.⁶

It is the **boldface** gradable adjectives in (56) that are ultimately responsible for introducing degrees into the semantics of scalar comparisons. It is thus not immediately clear how degrees would enter into the semantics of *different*, *same*, and *like*.

A possible response to this objection would be that the difference illustrated in (56) and (57) merely reflects the different ways in which gradable adjective meanings are introduced into the semantics of the two types of comparison. Specifically, while such meanings are introduced into the semantics of scalar comparisons by grammatical elements, it may be the utterance context that is ultimately responsible for introducing such meanings into the semantics of comparisons of similarity and difference. Perhaps the context provides the meaning of the adjective *tall* when it is height that is being discussed, so that when uttered in such a context, the sentence *I am different now than I used to be* asserts that the height I possess now is not identical to the height I used to possess. When what is under discussion is my weight, the context would provide the meaning of *heavy*, and so forth. Problems persist even for this refined view, however. The inability of *different*, *same*, and *like* to occur with subdeletion complements (see Section 2.2.2) remains mysterious, given that such complements denote sets of degrees. Why wouldn't (58a) be acceptable when what is under discussion is the extent to which the various books of the Bible hold one's interest?

- (58) a. *Deuteronomy is **different** than the other books are interesting.
 b. *This place is **the same** as it was beautiful a half century ago.
 c. *Ringo is a lot **like** I am happy.

6. Note that the version of (57c) in which *tall* precedes *like* is grammatical under an appositive interpretation of *like* and its clausal complement.

Also left unexplained is the fact that comparisons of similarity and difference cannot function as answers to degree questions, unlike scalar comparisons.

- (59) How tall is Bill?
 –5 feet 7 inches.
 –Taller than I expected him to be.
 –As tall as he was the last time you asked that question.
 *–Different than I expected him to be.
 *–The same as I expected him to be.
 *–Like I thought he would be.

Surely an utterance context in which an answer is desired for the question *How tall Bill?* would be one in which the meaning of *tall* is available. But then, if the comparators of similarity and difference in (59) provide information about the degree to which Bill is tall, just as the scalar comparisons do, it's not clear what prevents them from serving as felicitous answers.

I conclude, then, that despite the many parallels between scalar comparisons and those of similarity and difference, the degree-based semantics appropriate for the former should not be extended to the latter.

3.3 Comparison of sets of properties

In the remainder of this paper, I will develop the view that comparisons of similarity and difference constitute comparisons between sets of properties, so that at least some uses of *different*, *same*, and *like* denote relations between sets of properties. Under this view, the sentence *I am different now than I used to be* asserts that there is some difference between the properties that I used to possess and those that I now possess, i.e. that these two sets of properties are non-identical. The sentence *I am the same now as I used to be* makes the opposite assertion, namely that there is no difference between the properties that I used to possess and those that I now possess (i.e. set identity). Finally, the sentence *I am still (much) like I used to be* asserts that there is (much) overlap between the properties that I used to possess and those that I currently possess (i.e. non-empty set intersection). Some initial justification for such an approach comes from examples like the following ones, which demonstrate the relevance of properties when evaluating comparisons of similarity and difference.

- (60) a. But in regards to how my character in *Hope Floats* is **different** than I am, he's very calm and secure ... I am not secure in that way.
 b. I was almost **the same** person as I am now: gloomy, thoughtful, unhappy in groups, always reading in the back seat of cars.
 c. Apples are **like** oranges in that they are round, edible, have seeds, and so forth.

In each example in (60), a list of properties is provided in support of a preceding comparison of similarity or difference. In (60c), the assertion that apples are like oranges is supported with the observation that the two kinds of fruit share several properties, namely those of being round, edible, and seeded. Similarly, in (60a), the speaker supports his assertion that his character in the movie *Hope Floats* is different than he himself is by pointing out that only the character possesses the property of being secure. That this difference exists between the actor and his character ensures that the sets of properties possessed by the two are not identical. Observe as well that in response to *I am different now than I used to be* or *I am still much like I used to be*, a listener could legitimately respond with *How so?* or *In what way(s)?*, where what is asked for are some properties that either distinguish between or unite the speaker's current state and his previous state.

An appealing feature of this view is that the previously observed differences between scalar comparisons and comparisons of similarity and difference follow immediately. *Different*, *same*, and *like* do not combine with gradable adjectives because they do not compare sets of degrees. There is thus no need for them to combine with degree-introducing expressions. Relatedly, subdeletion complements are not attested in comparisons of similarity and difference because these unambiguously denote sets of degrees, not sets of properties. Recalling the generalization identified in Section 2.2.2, the claim here is that the proper analogue of (61) amongst scalar comparisons is not (62a), despite the superficial similarity in the size of their gaps, but rather (62b), the subdeletion case.

(61) John isn't much **different** than I thought he would be.

- (62) a. John is **taller** than Bill is.
b. The desk is **taller** than it is wide.

In both (61) and (62b), the nature of the gap most accurately correlates with the interpretation of the clausal complement as a whole; in the former, the property-sized gap in *than I thought he would be* reflects the complement's interpretation as a set of properties, while in the latter, the degree-sized gap in *than it is wide* reflects the complement's interpretation as a set of degrees. Finally, comparisons of similarity and difference do not form felicitous answers to degree questions because they provide information about properties, not degrees. Of course, such comparisons function perfectly well as answers to property questions.

- (63) How did the band sound?
–**Different** than I expected them to.
–**The same** as they did the last time I saw them.
–**Like** they always do ... polished but uninspired.

The above considerations should suffice to establish the initial plausibility of this approach to comparisons of similarity and difference. In the next section, I turn to its formalization.

4. Semantics for *different*, *same*, and *like*

In this section, I develop a formal semantic analysis of comparisons of similarity and difference based upon the notion that these constitute comparisons between sets of properties. Section 4.1 presents the basic semantic properties of *different*, *same*, and *like* and the constructions into which they enter. I also discuss the role of contextual restrictions in the interpretation of comparisons of similarity and difference. The approach outlined there is extended in Section 4.2 to accommodate the modification facts seen earlier. Section 4.3 briefly addresses the possibility of *de re/de dicto* interpretations for the clausal complements of *different*, *same*, and *like*. Two sets of facts that will not figure in this section concern the licensing of NPIs and the impossibility of downward monotone expressions in the complements of *different*, *same*, and *like*; I postpone further discussion of these facts until Section 5.

In what follows, I will only consider predicative uses of comparisons of similarity and difference. Their adverbial uses should not pose any additional complications, if adverbs are taken to denote properties of events. The proper analysis of their attributive uses suffers from the same uncertainties that pervade the literature on attributive scalar comparisons (see, e.g. Bresnan 1973; Heim 1985; Lerner & Pinkal 1995; Beil 1997; Heim 2000; Kennedy & Merchant 2000; Sharvit & Stateva 2002).⁷ Similarly, there is very little consensus on the proper analysis of nominal complements in scalar comparisons (see, e.g. Bresnan 1973; Hankamer 1973; Hoeksema 1983; Heim 1985; Lerner & Pinkal 1995; Kennedy 1999; Lechner 2001); what is at stake is whether some or all of these complements should be taken as base-generated nominals, or as (sometimes massively) reduced forms of clausal versions. Since one's answer to this question carries

7. A reviewer questions whether NP-internal occurrences of *same* and *different* as in (4b) and (5b) in fact quantify over properties, suggesting that they rather "express sameness/difference among entities." However, modification facts support the view that at least some NP-internal uses of *same* and *different* are amenable to the property-comparison analysis developed here.

- (i) These days, the Macworld conference attracts a much different audience than it did in the past.
(ii) I was almost the same person as I am now: gloomy, thoughtful, unhappy in groups, always reading in the back seat of cars.

(It should be noted that convincing examples of property-comparing NP-internal uses of *same* seem to be limited to predicative nominals; I have not yet found any clear examples of such uses in non-predicative NPs.) Note further that a distinction between property-comparing and individual-comparing NP-internal uses of *same* and *different* might parallel the distinction between attributive and amount scalar comparisons illustrated below:

- (iii) John read a longer book than Bill did. (attributive)
(iv) John read more books than Bill did. (amount)

significant implications for the resulting semantic analysis of nominal complements; I will here focus solely on clausal complements. Though all of these issues must eventually be addressed with respect to comparisons of similarity and difference, to do so here would distract attention from my primary goal, which is an investigation of their core semantic properties.

4.1 Basic semantic properties of comparisons of similarity and difference

My central claim is that many uses of *different*, *same*, and *like* are best understood as denoting relations between sets of properties. What are these relations? In the case of *different* and *same*, it seems reasonable to follow previous work in assuming these to express non-identity and identity. Two sets X and Y are non-identical ($X \neq Y$) just in case $\exists P[\neg(P \in X \leftrightarrow P \in Y)]$; that is, just in case there is some element that belongs to exactly one of the two sets. X and Y are identical ($X = Y$) just in case there is no such element, i.e. just in case $\forall P[P \in X \leftrightarrow P \in Y]$. The meanings of *different* and *same* can therefore be formulated as in (64) and (65).⁸

$$(64) \text{ different} = \lambda X.\lambda Y.\exists P[\neg(P \in X \leftrightarrow P \in Y)]$$

$$(65) \text{ same} = \lambda X.\lambda Y.\forall P[P \in X \leftrightarrow P \in Y]$$

As for *like*, I take it to denote the relation of non-empty set intersection, where X and Y possess a non-empty intersection ($X \cap Y \neq \emptyset$) whenever $\exists P[P \in X \ \& \ P \in Y]$. This yields the meaning for *like* in (66).

$$(66) \text{ like} = \lambda X.\lambda Y.\exists P[P \in X \ \& \ P \in Y]$$

It remains to be specified how these meanings for *different*, *same*, and *like* relate to the interpretations of their complements and the clauses in which they occur. Here, I borrow some techniques from the analysis of scalar comparisons presented in Section 3.2. Clausal complements of *different*, *same*, and *like* are interpreted as sets of properties (just as their counterparts in scalar comparisons are interpreted as sets of degrees). Perhaps the simplest way to achieve this result is to assume, following Chomsky (1977) and much subsequent work, that the property-sized gaps in these complements result

8. I adopt the following notational conventions:

- (i) x and y are individual variables (type e).
- (ii) P and Q are variables over properties (type $\langle s, \langle e, t \rangle \rangle$).
- (iii) X , Y , and Z are variables over sets of properties (type $\langle \langle s, \langle e, t \rangle \rangle, t \rangle$).
- (iv) p is a variable over propositions (type $\langle s, t \rangle$).
- (v) w and w' are possible world variables (type s).

Until the discussion of *de re/de dicto* ambiguities in Section 4.3, I ignore intensions.

from wh-movement of a null operator, the semantic function of which is to return the set of properties that satisfy the open sentence with which it combines. That such movement is involved in the derivation of these complements is supported by the island-sensitive nature of the gap noted in Section 2.2.1.

- (67) a. Stanford seems [different [than Op_1 it used to be t_1]].
- b. Stanford looks [the same [as Op_1 it looked t_1 five years ago]].
- c. Palo Alto is [like [Op_1 I remember it (being t_1)]].

Different, *same*, and *like* find one of their two arguments in the denotations of their complements. Their second argument comes from the denotations of their matrix clauses, which occur within the logical scope of *different*, *same*, and *like*; these too are interpreted as sets of properties.

In (68)–(70), I show the logical representations (b) and truth conditions (c) that this analysis assigns to the examples in (67).

- (68) a. Stanford seems different than it used to be.
- b. *different*(λP .Stanford-used-to-be- P)(λP .Stanford-seems- P)
- c. $\exists P[\neg(P \in \{Q: \text{Stanford used to be } Q\} \leftrightarrow P \in \{Q: \text{Stanford seems } Q\})]$
- (69) a. Stanford looks the same as it looked five years ago.
- b. *same*(λP .Stanford-looked- P -five-years-ago)(λP .Stanford-looks- P)
- c. $\forall P[P \in \{Q: \text{Stanford looked } Q \text{ five years ago}\} \leftrightarrow P \in \{Q: \text{Stanford looks } Q\}]$
- (70) a. Palo Alto is like I remember it (being).
- b. *like*(λP .I-remember-Palo-Alto-being- P)(λP .Palo-Alto-is- P)
- c. $\exists P[P \in \{Q: \text{I remember Palo Alto being } Q\} \ \& \ P \in \{Q: \text{Palo Alto is } Q\}]$

Observe that in (68b), *different* takes logical scope over its matrix clause, which denotes the set of properties that Stanford seems to (currently) possess. The other argument to *different* is provided by the denotation of its clausal complement *than it used to be*, which corresponds to the set of properties that Stanford used to possess. The example is true just in case (68c) holds; that is, just in case there is some property that Stanford used to possess but does not seem to currently possess, or vice versa. As we noted earlier in connection with (60), such a property in some sense constitutes a difference between Stanford's past state and its current state. (69) and (70) proceed similarly, save for the relations expressed by *same* and *like* and the sets of properties that they combine with. Example (70a) is true just in case there is some property that I remember Palo Alto to possess and that Palo Alto does in fact possess; such a property constitutes a similarity between my recollection of Palo Alto and its actual state. Example (69a) is true just in case every property that characterizes Stanford's appearance from five years ago also characterizes its current appearance, and vice versa; here, what is required is maximal similarity between its current appearance and its appearance from five years ago.

At this point, a valid objection to the meanings just formulated for *different* and *same* is that they apparently predict examples like the following ones to always be false (see also the discussion of the examples in (47)).

- (71) a. I'm **the same** as I used to be.
b. I'm **no different** than I used to be.

(Assume for the moment that *no* in (71b) simply functions as sentential negation.) After all, there must surely be some difference between the properties that I used to possess and those that I currently possess; at the very least, I am older at this moment than I've ever been before. Yet (71a) and (71b) assert that these sets are identical. How, then, can they ever be judged as true?

The answer to this question is in fact rather simple: the quantification over properties that *different*, *same*, and *like* perform must be restricted to only those properties that are contextually relevant. Such contextual restrictions are familiar from quantification over individuals; they ensure that sentences like *Everyone is taller than me* and *The table is too big to fit through the door* are not necessarily false or undefined, respectively. Their presence here can be signaled overtly with phrases like *in these ways* or *in that respect*:

- (72) a. In that respect, humans are **no different** than quantum semi-conductor circuits.
b. In many ways, I'm still **the same** person as I was before.
c. With respect to their taste, oranges are a lot **like** tangerines.

The effects of these contextual restrictions can be formalized by assuming that every utterance context delimits a set of contextually relevant properties *C*, and that the set-theoretic relations expressed by *different*, *same*, and *like* are only required to hold between the contextually relevant portions of the sets provided to them as arguments. This is shown in (73)–(75); in each case, the (a)- and (b)-formulations are equivalent.

- (73) a. *different* = $\lambda X.\lambda Y.\exists P[P \in C \ \& \ \neg(P \in X \leftrightarrow P \in Y)]$
b. *different* = $\lambda X.\lambda Y.\exists P[\neg(P \in X \cap C \leftrightarrow P \in Y \cap C)]$

- (74) a. *same* = $\lambda X.\lambda Y.\forall P[P \in C \rightarrow (P \in X \leftrightarrow P \in Y)]$
b. *same* = $\lambda X.\lambda Y.\forall P[P \in X \cap C \leftrightarrow P \in Y \cap C]$

- (75) a. *like* = $\lambda X.\lambda Y.\exists P[P \in C \ \& \ (P \in X \ \& \ P \in Y)]$
b. *like* = $\lambda X.\lambda Y.\exists P[P \in X \cap C \ \& \ P \in Y \cap C]$

Examples (71a) and (71b) will then be true in some context just in case the set of contextually relevant properties that I used to possess is identical to the set of contextually relevant properties that I currently possess; this will be possible whenever the original

arguments to *same* are not disjoint sets. (I generally will not represent the contribution of *C* explicitly.)⁹

Before moving on to the modification facts surrounding *different*, *same*, and *like*, should point out that this analysis bears some resemblance to Nunberg's (1984) analysis of *same*. Nunberg was concerned with the observation that sentences involving *same* (as well as *different*, though he does not discuss these) sometimes permit a type reading, in addition to the expected token reading, so that (76) can be true even if Enzo and I are not co-owners of any particular automobile, so long as we both own cars of the same make, model, and (perhaps) year.

- (76) Enzo owns **the same** car as I do.

Nunberg suggests that what is relevant here is that the car that I own and the car that Enzo owns possess identical sets of contextually-relevant properties. However, he formalizes this suggestion in a quite different way than I have chosen here. Following Keenan (1982), he chooses to eliminate individuals as the primitive elements in semantic model, replacing them with properties; individuals are then defined as sets of properties. He further assumes that an utterance context may restrict the set of properties represented in a model, so that in certain contexts, the expressions *the car that I own* and *the car that Enzo owns* will literally possess identical denotations, despite their corresponding to distinct real-world entities; this will be so whenever the properties that distinguish between them are not present in the model. Assertions involving *same* are ultimately taken to be assertions of identity between individuals; however, the notion of individual that is employed allows one model-theoretic individual to correspond to many real-world entities, predicting that (76) may be true in certain contexts even if Enzo and I do not actually stand in mutual ownership of any automobile. Nunberg's analysis thus presents an interesting hybrid of the individual-based approaches to *different* and *same* listed in Section 3.1 and the property-based approach developed here.

Lasersohn (2000) observes that Nunberg's analysis encounters an "effability" problem with examples like the following one.

- (77) I own a Ford Falcon. **The same** car is owned by Enzo.

9. A reviewer rightly observes that the analysis developed in this section does not account for the following difference between *same* and *like*:

- (i) Stanford looks {the same as, like} it used to look.
(ii) Stanford looks {?*the same as, like} Paris used to look.

The reviewer suggests that constructions involving *same*, but not *like*, must obey a "same subject" constraint. Further research is necessary in order to determine whether this constraint holds across a larger set of examples, and if so, what its source is.

Suppose I am the sole owner of one Ford Falcon, and Enzo is the sole owner of another. Then, the property of being owned by Enzo is one that distinguishes between the car that I own and the car that Enzo owns. In order to refer to these as the same car in (77), it must be the case that this property is not represented in the model. But then, what do we take as the denotation for the phrase *is owned by Enzo*? It would appear that there is no denotation for it at all, and yet, (77) is perfectly felicitous. Note that the analysis developed here does not suffer from this problem. Under this analysis, what the context restricts is the domain of the quantification over properties performed by *different*, *same*, and *like*, not the domain of properties itself. Assuming that the general approach to type readings pursued by Nunberg is correct, (77) can be true for the same reason that (78) can be.

(78) Everyone is taller than Bill.

For (78) to be true, it must be the case that Bill is excluded from the domain of individuals that *everyone* quantifies over, yet this does not prevent us from elsewhere referring to Bill.

4.2 Modifiers

4.2.1 Modifiers of *different* and *like*

Recall from Section 2.3.1 that *different* and *like* occur with the modifiers *much*, *a lot*, *a great deal*, *no(thing)*, (negative polarity) *any(thing)*, and *little*, a feature shared by scalar comparisons of inequality. Informally, these modifiers can be described as providing some measure of the amount of similarity or difference that holds between the items of comparison. Outside of the realm of comparison, one also finds these phrases occurring in existential noun phrases, such as those in (79).

- (79) a. There is still {much, a lot, a great deal} (of) work left to be done.
 b. There are {no, not any} problems left to be solved.
 c. There is little hope of an early settlement in Microsoft's legal dispute with the European Commission.

The meanings given in (64) and (66) make clear the sense in which assertions involving *different* and *like* are assertions of existence; in each case, what is required for such an assertion to hold is that there exist (or, in the case of *no(thing)* and *little*, not exist) some number of properties of the relevant sort. It is thus unsurprising to find such parallels between *different* and *like* and existential noun phrases (see Seuren 1973 and von Stechow 1984a for analyses of scalar comparisons of inequality as existentials).

Still, something additional must be said in order to account for these facts. As currently formulated, the meanings for *different* and *like* do not permit them to combine with any modifiers; each is specified to take only two arguments, and yields a closed sentence upon saturation. Let us suppose that *different* and *like* do not always introduce

existential quantification themselves, but may alternatively combine with their arguments to yield sets of properties, as in (80) and (81).

(80) *different* = $\lambda X.\lambda Y.\lambda P[\neg(P \in X \leftrightarrow P \in Y)]$

(81) *like* = $\lambda X.\lambda Y.\lambda P[P \in X \ \& \ P \in Y]$

Then, for any sets of properties X and Y , *different*(X)(Y) and *like*(X)(Y) will also denote sets of properties, the former being the set of all properties that distinguish between X and Y , and the latter being the set of all properties that belong to both X and Y . The modifiers of *different* and *like* can then be interpreted as cardinality predicates over these sets.

(82) *much* = $\lambda X.|X| > n$ (similarly for *a lot* and *a great deal*)

(83) *no(thing)* = $\lambda X.|X| = 0$

(84) *any(thing)* = $\lambda X.|X| > 0$

(85) *little* = $\lambda X.|X| < m$

The denotations of “positive” modifiers like *much*, *a lot*, and *a great deal* require that there be sufficiently many properties in the sets with which they combine; exactly how many properties counts as sufficient is entirely vague and context dependent. The “negative” modifiers *no(thing)* and *little*, on the other hand, require that their sets be sufficiently small. With *little*, the exact nature of this requirement is again vague and set by the context, while *no(thing)* imposes the stronger requirement that its set be empty (i.e. that there not exist any members). Finally, the NPI *any(thing)* requires that its set be non-empty; this follows the well-established treatment of NPI *any* as a (narrow scope) existential.

Some illustrative examples follow.

- (86) a. Stanford seems much *different* than it used to be.
 b. *much*(*different*(λP .Stanford-used-to-be- P)(λP .Stanford-seems- P))
 c. $|X| > n$, where
 $X = \{P: \neg(P \in \{Q: \text{Stanford used to be } Q\}) \leftrightarrow P \in \{Q: \text{Stanford seems } Q\}\}$
- (87) a. Palo Alto is nothing *like* I remember it (being).
 b. *nothing*(*like*(λP .I-remember-Palo-Alto-being- P)(λP .Palo-Alto-is- P))
 c. $|X| = 0$, where
 $X = \{P: P \in \{Q: \text{I remember Palo Alto being } Q\} \ \& \ P \in \{Q: \text{Palo Alto is } Q\}\}$
- (88) a. I'm not any *different* than I used to be.
 b. *not*(*any*(*different*(λP .I-used-to-be- P)(λP .I-am- P)))
 c. $\neg|X| > 0$, where $X = \{P: \neg(P \in \{Q: \text{I used to be } Q\}) \leftrightarrow P \in \{Q: \text{I am } Q\}\}$

The semantic contributions of these modifiers thus receive a uniform treatment, with the only variation across their meanings found in the cardinality requirement that each imposes.

What, then, of cases where no modifier is present? I assume that such sentences are true just in case the set of properties returned by *different* or *like* is non-empty. In effect, this is no different than assuming that the existentially-quantified meanings for *different* and *like* in (64) and (66) exist alongside the versions in (80) and (81), perhaps via existential closure of the latter meanings. This ensures that the sentences *Stanford seems different than it used to be* and *Palo Alto is like I remember it (being)* still receive the truth conditions given in (68c) and (70c).

4.2.2 Modifiers of same

Recall next from Section 2.3.2 that *same* occurs with such modifiers as *nearly*, *almost*, *roughly*, *(not) quite*, and *just about*, a feature shared by scalar equative comparisons. Outside of the realm of comparison, these modifiers also occur in universal noun phrases, as in (89).

- (89) a. {Nearly, almost, roughly, just about} everyone that you meet in Santa Cruz has a tattoo.
b. I'm sure that not quite everyone would agree with that statement.

The meaning in (65) makes clear that *same* involves universal quantification over properties. It is thus unsurprising to find such parallels between *same* and universal noun phrases (see Seuren 1984 and Heim 2000 for analyses of scalar equative comparisons as involving universal quantification). Though I will not provide any further analysis of its modification properties here, I see no reason why an account of the universal noun phrases in (89) could not be extended to the analogous facts regarding *same*.¹⁰

10. Two other modifiers worth mentioning are *exactly* and *just*, which appear with *same* and *like*.

- (i) She looks {exactly, just} the same as she did before.
(ii) She looks {exactly, just} like she did before.

In both (i) and (ii), the presence of *exactly* or *just* seems to yield a stronger statement than what would result in their absence. Their semantic contributions differ across the two examples, however. When they occur with *like*, *exactly* and *just* have truth-conditional effects, so that (iii) is not contradictory; *exactly like* and *just like* are essentially synonymous with *same*.

- (iii) She still looks like her twin sister, but she no longer looks {exactly, just} like her.

On the other hand, the oddness of (iv) suggests that *exactly* and *just* do not yield stricter truth conditions when they occur with *same*.

- (iv) #She still looks the same as her twin sister, but she no longer looks {exactly, just} the same as her.

Such “non-truth-conditional” uses of *exactly* as in (iv) are discussed by Lasersohn (1999).

4.3 De re/de dicto ambiguities

Finally, recall the *de re/de dicto* ambiguities observed in Section 2.6 for comparisons of similarity and difference occurring in intensional contexts. Let me briefly sketch an analysis of these facts which closely follows proposals made in von Stechow (1984a) and Heim (2000) for scalar comparisons. I take declarative complement clauses (e.g. *that John sounded different than he did*) to denote propositions, or sets of possible worlds. Intensional verbs like *think*, *realize*, and *say* in turn denote (intensional) relations between individuals and propositions; the verb *think*, for instance, denotes the relation between an individual and a proposition that holds just in case the proposition is true in each of the worlds consistent with the individual's beliefs (below, $Acc_x(w)$ represents the set of worlds consistent with x 's beliefs in w).

$$(90) \quad think = \lambda p. \lambda x. \lambda w. \forall w' [w' \in Acc_x(w) \rightarrow w' \in p]$$

- (91) a. Mary thinks that John sounded different than he did. (de dicto)
b. $think_w(\lambda w'. different_w(\lambda P. J-sounded-P_w)(\lambda P. J-sounded-P_w))(Mary_w)$
c. $\forall w' [w' \in Acc_m(w) \rightarrow \exists P [-(P \in \{Q: J \text{ sounded } Q \text{ in } w\}) \leftrightarrow P \in \{Q: J \text{ sounded } Q \text{ in } w'\}]]]$

The logical representation and truth conditions in (91b,c) correspond to the “contradictory” *de dicto* reading of (91a), where what is asserted is that in each of Mary's belief worlds, the set of properties that characterize the way John sounded in that world is not identical to itself. To derive the “mistaken” *de re* reading, I assume that the possible world variable occurring in the clausal complement's interpretation need not be locally bound by the proposition-forming lambda operator, and that when this variable goes unbound, it receives as its value the evaluation world of the entire sentence.

- (92) a. Mary thinks that John sounded different than he did. (de re)
b. $think_w(\lambda w'. different_w(\lambda P. J-sounded-P_w)(\lambda P. J-sounded-P_w))(Mary_w)$
c. $\forall w' [w' \in Acc_m(w) \rightarrow \exists P [-(P \in \{Q: J \text{ sounded } Q \text{ in } w\}) \leftrightarrow P \in \{Q: J \text{ sounded } Q \text{ in } w'\}]]]$

As shown in (92), the result is that the complement *than he did (sounded)* denotes the set of properties that characterize the way John sounded in the evaluation world of the entire sentence (i.e. the actual world). The example is then true under its *de re* reading just in case this set is not identical to any of its correspondents in Mary's belief worlds: in other words, whenever Mary possesses an incorrect belief about the way John sounded.

5. Further issues

I'd like to now briefly discuss some outstanding issues for the approach to comparisons of similarity and difference developed here.

5.1 NPIs and downward monotone expressions in clausal complements

Two sets of facts that remain unaccounted for concern the licensing of NPIs and the impossibility of negation and other downward monotone expressions in the clausal complements of *different*, *same*, and *like*.

- (93) a. I felt **different** than I ever had before.
 b. Robin's been belting out those classic Cheap Trick tunes for a quarter-century and sounds **the same** as he ever did!
 c. *I felt **like** I ever had before.
- (94) a. *College is a lot **different** than I doubted it would be.
 b. *I think that I feel **the same** as no one else does.
 c. *Duncan looks a lot **like** I don't before my first cup of coffee.

It remains to be seen whether the analysis developed in Section 4 can be suitably extended to predict the facts illustrated in (93) and (94). It is worth noting that in the analyses of von Stechow (1984a) and Rullman (1995), the analogous facts regarding scalar comparisons ultimately derive from the same assumption, namely that the clausal complement of a scalar comparison denotes a unique maximal degree, rather than a set of degrees as in (51) (see the cited works for further details). Future research should also reveal whether a unified analysis of (93) and (94) is possible for comparisons of similarity and difference, and if so, whether such a unification is desirable.

5.2 Further modifiers of *different* and *like*

We have already seen that *different* and *like* occur with such modifiers as *much*, *no(thing)*, and *little*, which elsewhere occur in scalar comparisons, but not with simple gradable adjectives. There are other modifiers that demonstrate a largely complementary distribution: these may occur with simple gradable adjectives, but are excluded from scalar comparisons. The class of such modifiers includes *very*, *extremely*, and *entirely*.

- (95) a. LeBron is {very, extremely} tall.
 c. My glass is entirely empty.
- (96) a. *LeBron is {very, extremely} taller than I remembered him being.
 c. *My glass is entirely emptier than yours.

These modifiers are permitted with *different* and *like* (Bresnan 1973: 278 fn. 4; Huddleston & Pullum 2002: sect. 13.5; see also Laca & Tasmowski 2003 on French *différent*).

- (97) a. Domestic rats are very **different** than sewer rats.
 b. Japanese baths are extremely **different** than those in North America.
 c. "The Village" turns into a movie entirely **different** than you might expect.

- (98) a. The Siberian polecat (*Putorius evermanni*) is very **like** the European in size, color, and proportions.
 b. Klaatu first appeared on the scene in 1976, and created quite a commotion in the music world because it sounded extremely **like** the Beatles.

It appears, then, that *different* and *like* simultaneously exhibit the modification possibilities seen in scalar comparisons as well as those demonstrated by simple gradable adjectives.

A related observation is that while scalar comparisons cannot themselves participate in further scalar comparison, constructions headed by *different* and *like* can. The examples in (48) already demonstrate this; further examples are provided below.

- (99) *Chris is **more happier** (than Bill) than he was the last time I saw him.
- (100) Apples are **different** from pears, but oranges are even **more different** from pears than apples (are).
- (101) That is why the Navy is **more like** the zoo than it is like the Church.

A plausible explanation for the ungrammaticality of (99) is that there is no degree variable available for the higher occurrence of *more* to bind: the degree variable introduced by *happy* is already bound by the lower occurrence of *-er*, which itself does not introduce any degree variable.¹¹ If *very*, *extremely*, and *entirely* also bind degree variables, then this explanation immediately extends to the facts in (96).

As formulated here, the meanings for *different* and *like* make no reference to degrees either. The expectation is then that the examples in (97), (98), (100), and (101) should also be ungrammatical, since there are no degree variables available for (e.g.) *very* or *more* to bind. Something more must be said to account for these examples.

6. Conclusion

A major theme of this paper has been the parallelism that obtains between comparisons of similarity and difference and scalar comparisons. Not only did this parallelism guide the empirical investigation of constructions involving *different*, *same*, and *like* conducted in Section 2, but it also motivated many aspects of the semantic analysis of these constructions presented in Section 4. Nonetheless, certain differences between the two types of comparison have crept into the discussion throughout the paper. Some of these, such as the status of subdeletion complements, were argued in Section 3 to reflect a more

11. I follow Schwarzschild (2005) in taking measure phrase modifiers of scalar comparisons (e.g. *much more expensive*, *two feet taller*) to be predicates of scalar intervals (sets of degrees), rather than degrees.

fundamental difference between the sorts of objects that enter into the two comparisons: whereas scalar comparisons are comparisons between (sets of) degrees, comparisons of similarity and difference constitute comparisons between sets of properties. There are other differences, though, that point to a more complex view of comparisons of similarity and difference than the one presented here. In particular, the modification facts discussed in Sections 2.3 and 5.2 indicate that *different* and *like* somehow maintain dual existences as both comparison heads and ordinary gradable expressions. Another difference that points in this direction is the relatively simple morphosyntax of the heads of comparisons of similarity and difference. While there are certainly puzzles here, such as the categorial status of *like* (adjective, preposition, or both?) and the relation between *the* and *same*, one does not encounter difficulties of the sort seen in scalar comparisons, where the mode of morphosyntactic combination between *more/er*, *less*, and *as* and their adjacent gradable adjectives is a point of perennial disagreement. Rather, *different*, *like*, and *same* exist as basic lexical items. However, their complementation possibilities simultaneously cross-classify them as the heads of comparative constructions, so in their morphosyntactic properties as well, *different*, *same*, and *like* resemble both comparison heads and ordinary gradable expressions. This double life has gone unexpressed in the analysis developed here, which treats them exclusively as comparison heads. It also makes *different*, *same*, and *like* potentially revealing windows into the structures and distinctions that should underlie a more general analysis of gradability and comparison: these come together here in a manner unattested in scalar comparisons and ordinary gradable expressions. Whatever the proper account of this dual nature may ultimately be, it should lead to not only a better understanding of constructions involving *different*, *same*, and *like*, but also of the syntax and semantics of gradability and comparison, broadly construed.

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Characterizing superlative quantifiers

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The present paper develops a semantic analysis of superlative descriptions as a subclass of definite DPs: the definite determiner in superlatives (and not the superlative itself) is analyzed as the locus of the contextual restrictions. Evidence from presuppositions and from different dependent readings of superlatives supports the parallel between superlatives and definites. I also show that a distinction should be drawn between two types of contextual restriction: the context set of the definite and the frame of comparison of the superlative. The paper further discusses the role of focus in the comparative reading of superlatives in an array of constructions such as existential sentences and focused quantifiers such as *everybody*, *several X* and *many X*. Finally, I show that the hypotheses introduced are sufficient to explain the much debated “upstairs *de dicto*” reading (Heim 1999).

1. Superlatives: The absolute and the comparative

The study of superlatives has undergone a dramatic change in focus during the last two decades. Traditional grammarians were mostly interested in morpho-syntactic issues, such as relating comparative and superlative morphology; the taxonomy of superlatives as an “adjective class”; the relationship between superlatives and elatives—for example, in Latin and the Romance languages they share morphological expression: *-issimus* means both ‘very X’ and ‘the X-est’—; etc. The contemporary approach to the formal analysis of superlatives, as developed from the mid-eighties, has been increasingly paying more attention to semantic issues, such as the readings of superlatives and the linguistic factors that determine them; the analysis of superlative morphemes as operators, susceptible of entering into scopal relations and sharing properties with other quantificational expressions; the role of contextual factors; etc.

The landmark study in the contemporary understanding of superlatives is without a doubt Szabolcsi (1986). Following an insight by Ross (1964), Szabolcsi observed that superlatives are ambiguous. The superlative description—syntactically, the superlative DP—the *highest mountain* in (1) may have two interpretations.

- (1) John climbed the highest mountain.

