

So as a weak degree expression*

Elena Castroviejo-Miró
CCHS-CSIC

Abstract

This paper aims to answer three questions about the degree expression *so* in English: (i) what semantics does it contribute? (I.e., in what ways is *so* different from *enough*?) (ii) how can we explain its restricted distribution? And (iii) how does the *that*-clause compose with *so*? I point out that equating *enough* and *so* (as has been done in the literature) is problematic, and I propose that a new approach that establishes an analogy between *so* and weak pronouns can yield satisfactory answers to questions (i)–(iii). In a nutshell, I argue that there are two *sos*: a strong (deictic) one and a weak (anaphoric) one. I concentrate on weak *so* and show that its limited distribution has to do with the informational properties of weak items more generally. I further claim that its accompanying *that*-clause is not a complement of *so*, but rather an adjoined sentence that provides a *bona fide* focus to the sentence.

Keywords: *so*, *enough*, gradability, modality, anaphora, familiarity, focus

1 Introduction

This paper seeks to provide a semantics for the degree word *so* in English in contexts such as (1) and (2).

- (1) a. A: Bill is 2 meters tall.
b. B: Do you really think he's so tall?
- (2) John is so brave that he swam with sharks in the aquarium.

In these examples, *so* combines with a gradable predicate and roughly conveys that the degree reached meets a threshold that may be determined differently in the two cases, but which is high. The purpose here is to spell this out and to compare *so* with related degree words such as *so* in (3) or *enough* in (4).

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- (3) Bill is so tall. [+ pointing gesture]
(4) John is brave enough to swim with sharks in the aquarium.

My claims are the following:

- *so* does not have the same meaning as *enough*, although *enough ... to* and *so ... that* constructions are interchangeable in many contexts.
- *so* has anaphoric and deictic uses, and anaphoric *so* (“weak *so*”) cannot occur in focus position.

The paper starts with a review of a previous modal analysis of the *so ... that* construction (§2); section 3 focuses on a proposal for the semantics of *so* in terms of its weak discursive properties; later on, I address the semantics of the *so ... that* construction (§4). Finally, section 5 wraps up and points out the main lines for future research.

2 A modal analysis

In this section I first present the main arguments of a modal analysis of *so*, which is based on ?’s seminal paper on the semantics of *too*, *enough* and *so ... that*. I then mention a few problematic aspects of a modal approach to *so*, which lead me to propose an alternative, in section 3.

2.1 *so* ≡ *enough*

In Meier’s analysis of the *so ... that* construction, *so* and *enough* are given a fairly similar interpretation, where the sentential complements of both degree words include implicit or explicit modalization, as shown in (5) (and similarly ?).

- (5) *x* is ADJ enough MODAL *p*

The presence of a sentential complement is essential in this approach, since the explicit or implicit modal occurs in it. By default, *enough* selects for the existential quantifier over worlds *can*. With a specific example, (6a) and (6b) are equivalent in this proposal.

- (6) a. Bertha is old enough to drive a car.
b. ≡ Bertha is old enough *to be able* to drive a car.

The paraphrase of (6) is in (7).

- (7) “The maximal degree e such that Bertha is e -old is greater than or equal to the minimal e^* such that, if Bertha is e^* -old, she can drive a car in view of the law.”

Here, *enough* establishes a \succeq relation between two degrees: (1) the maximal degree such that the referent of the subject has a property to this degree (Bertha’s actual age); (2) the minimal degree such that if the referent of the subject has this property to degree (1) (if Bertha has her actual age), then the sentential complement can be made true (Bertha can drive a car).

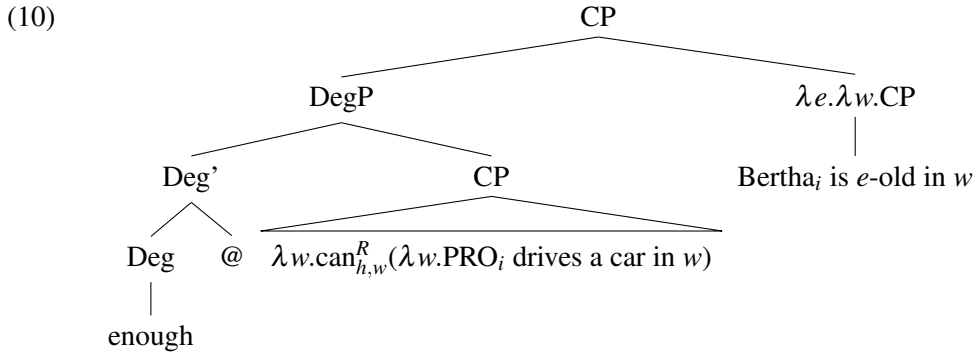
In this account, the combination of the modal *can*, the \succeq relation and the threshold being a minimal degree yields sufficiency, which is encoded in the meaning of *enough*.

As shown in (8), *enough* is a function that takes a world plus two arguments; one is the denotation of an inherent conditional construction containing a modal (of type $\langle s, \langle p, t \rangle \rangle$), and the other one is the denotation of the main clause once the degree expression has QR-ed at LF (of type $\langle d, p \rangle$) (cf. (10)).

- (8) $[[\text{enough}]] = f : D_{\langle s, \langle \langle s, \langle p, t \rangle \rangle \langle \langle d, p \rangle, t \rangle \rangle}$
 For all $w \in W, Q \in D_{\langle s, \langle p, t \rangle \rangle}$ and $P \in D_{\langle d, p \rangle}$
 $f(w)(Q)(P) = 1$ iff
 $\text{MAX}(\lambda e. P(e)(w)) \succeq \text{MIN}(\lambda e^*. Q(w)(P(e^*)))$

(9) is the composition of example (6a), and (10) is its LF.

- (9) $[[\text{enough} (@)(\lambda w. \text{can}^R(w)(h)(\lambda w. \text{PRO}_i \text{ drives a car in } w))$
 $(\lambda e. \lambda w. \text{Bertha is } e\text{-old in } w)]^g = 1$
 iff $\text{MAX}(\lambda e. \text{Bertha is } e\text{-old in } @) \succeq$
 $\text{MIN}(\lambda e^*. (\cap (g(h)(@) \cup \{\{w | g(x_i) \text{ drives a car in } w\}\}) \cap$
 $\{w | \text{Bertha is } e^*\text{-old in } w\} \neq \emptyset))$



Why is *enough* relevant for our purposes? Because in this account, *so* has roughly the same denotation as *enough* except for the choice of the modal. Take sentence (11).

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(11) The jet flies fast enough to beat the speed record.

In the modal account, (11) is equivalent to (12a), and they can be both paraphrased as (12b).

- (12) a. The jet flies so fast that it can beat the speed record.
b. “The e such that the jet flies e -fast \succeq the minimal e^* such that, if the jet flies e^* -fast, it can beat the speed record, given what we know.”

Realize that *so* and *enough* in the previous sentences are both interpreted as including the modal *can*. The difference between these two degree words is that unless the modal is explicit in the *so* . . . *that* construction, the default inherent modal is *have to*. That is, (13a) and (13b) are claimed to mean the same.

- (13) a. The jet flew so fast that it beat the speed record.
b. \equiv The jet flew so fast that it had to beat the speed record.

By choosing the universal quantifier *have to*, Meier assures the actuality of the *that*-clause; i.e., the fact that we rented the apartment in (14).¹

- (14) a. The apartment has such a beautiful view that we rented it.
“The (max.) e such that the apartment has a e -beautiful view \succeq the minimal e^* such that, if the apartment has a e^* -beautiful view, we have to rent it.”
b. The apartment has a view beautiful enough for us to rent it.
“The (max.) e such that the apartment has a e -beautiful view \succeq the minimal e^* such that, if the apartment has a e^* -beautiful view, we can rent it.”

2.2 Problems

The analogy between *so* and *enough* seems to yield desirable results. However, I want to show that *so* and *enough* also have non-trivial differences that cannot be accounted for easily by a simple change of modal.

To begin with, we have not paid attention to the fact that *enough* (and *too*) has a non-finite sentential complement, whereas *so* is followed by an inflected *that*-clause.

In fact, if we look beyond English and German and consider languages that have subjunctive mood, such as Romance, we can identify an additional meaningful distinction between those sentential complements. Specifically, when *enough* is followed by an inflected clause, it is in the subjunctive mood, whereas *so*'s *that*-clause is always in the indicative. Observe the examples in (15) from Catalan.

¹ It is assumed that *so* and *such* are syntactically different but semantically the same in the relevant respects.

- (15) a. El meu gos va bordar prou fort perquè els veïns es
 the my dog barked enough strong for.what the neighbors REFL
 despertessin.
 wake.up.SUBJ
 ‘My dog barked loud enough for the neighbors to wake up.’
- b. El meu gos va bordar tan fort que els veïns es van despertar.
 the my dog barked so strong that the neighbors REFL wake.up.IND
 ‘My dog barked so loud that the neighbors woke up.’

The fact that *enough* selects for a *to-* or *for-*clause instead of a *that-*clause need not be relevant, but it is relevant that *so*’s *that-*clause does not have subjunctive morphology and, thus, any hints that reveal underlying modalization. Therefore, postulating inherent modalization for the *that-*clause may be a stipulation.

On the other hand, if we return to English, the equivalence in (16) seems problematic, too.

- (16) a. My dog barked so loud that he woke up the neighbors.
 b. ≡ My dog barked so loud that he had to wake up the neighbors.

(16b) conveys that the loudness of the barking was high enough to force my dog to wake up the neighbors, and this meaning is not conveyed by (16a).

Moreover, the actuality of the sentential complement shows different patterns for the *to-*clause and the *that-*clause, as shown in (17).²

- (17) a. My dog barked loud enough to wake up the neighbors (but he didn’t wake them up).
 b. My dog barked so loud that he woke up the neighbors (# but he didn’t wake them up).

In (17a) it is not necessary for the neighbors to wake up, unlike in (17b), where contradicting this claim yields unacceptability.

Furthermore, the threshold that is met or exceeded in a *so* construction needs to be above standard, whereas there is no such requirement for the *enough* construction. We can see this in (18): note that in (18a), Bill and the shelf can be any height as long as Bill’s tallness meets the height that it takes to reach the shelf. By contrast, in (18b), both Bill and the shelf have to be at least tall.

- (18) a. Bill is tall enough to reach the shelf.

² As shown by ? a.o., the actuality of the complement may hinge on the aspect of the verb. This is again more obvious in languages with morphological aspect such as Romance.

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b. Bill is so tall that he reaches the shelf.

This requirement should explain the oddness of (19) (compare it to (6a)).

(19) # Bertha is so old that she can drive a car.

And a final piece of evidence is presented in (20).

(20) To solve this problem you don't have to be very smart.

a. Then, my little brother will be smart enough to solve it on his own.

b. # Then, my little brother will be so smart that he'll be able to solve it on his own.

In the scenario described above, where it is specifically stated that the degree of smartness need not be high, only *enough* (i.e., not *so*) is acceptable.

Finally, let us move on to the cases where the relevant degree words occur complementless. While we find *enough* complementless in declarative positive contexts, as shown in (21), *so* can only occur in positive declarative contexts in two independent cases (cf. (22)): (i) with an exclamative intonation and/or with a *that*-clause, or (ii) when it behaves like a demonstrative.

(21) a. A: To swim in the aquarium with sharks, you have to be quite brave.

b. B1: Bill is brave enough (to swim in the aquarium with sharks).

c. B2: Bill is so brave # (as to swim with sharks).

(22) a. # Bill is so tall.

b. Bill is so tall!

c. Bill is so tall. [+ pointing gesture]

There is nothing in the modality account that predicts these facts.

Interestingly, when both *enough* and *so* occur complementless, their differences in meaning can become more obvious, as in (23).

(23) a. It's amazing that Bill is so tall. \neq It's amazing that Bill is tall enough.

b. I never thought that my mother would be so strong. \neq I never thought that my mother would be strong enough.

Intuitively, to make sense of the *enough*-sentences, we have to retrieve from context the answer to *enough for what?*, whereas in the *so*-sentences we do not appeal to an underlying *that*-clause to grasp what degree is being discussed.

3 A weak vs. strong analysis

The modal analysis seems correct to account for the behavior of *enough*, but we have seen that there is no evidence for such an analysis in the case of *so*. In this section I develop an alternative analysis that can account for the distribution of complementless *so*. The semantics provided highlights the similarities between *so* and weak pronouns in the sense that they all involve familiarity presuppositions and yield infelicity when they occur in focus position.

3.1 Strong vs. weak pronouns

Anaphora and deixis are two uses of referential expressions. In the literature on the semantics of pronouns (e.g., ??) these are two sides of the same coin; no relevant distinction is established between the two. At most, ? includes a presupposition on demonstratives such that they can be accompanied by a pointing gesture. However, if we look at these two uses from an information structure perspective, we realize that deixis and anaphora do exhibit relevant differences. This is pointed out by ?, who discusses anaphorically and deictically used pronouns separately.

Deictically used pronouns (which I call “strong” following traditional grammar) are always accented, they are used to make a shift in focus and re-direct the listener’s attention, and they are typically accompanied by a pointing gesture. According to Bosch, if a pronoun is referential and in focus position, then it is deictic.

On the other hand, anaphorically used pronouns (which I call “weak”) are deaccented, and they refer to an individual the listener’s attention is already oriented to.

Thus, pronouns impose familiarity presuppositions irrespective of their uses (as Heim and Roberts claim), but while deixis is used in a conversation to direct the interlocutor’s attention to a discourse referent that has not yet been the focus of attention, anaphora refers to a discourse referent that is already the focus of attention (i.e., no reorientation takes place).

The difference between these two uses are obvious in certain languages where weak and strong pronouns are different lexical items. As is shown in (24) and (25) (from ?: p. 107), weak pronouns cannot be the focus of a sentence; the b. examples are ill-formed uses of weak pronouns in deictic contexts.

(24) French

a. C’est lui qui parle.
it’s him who talks

b. *C’est il qui parle.
it’s him who talks

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‘HE is talking.’

(25) Italian

a. Tu gli scrivi.
you him write

‘You write to him.’

b. *Tu gli scrivi, e non a mia sorella.
you him write and not to my sister

c. Tu scrivi a lui, e non a mia sorella.
you him write and not to my sister

‘You write to HIM, and not to my sister.’

In French, *lui* is the tonic (here, “strong”) pronoun and *il* is the atonic (here, “weak”) one. They match in the rest of their features, but they differ in the fact that the former can be focalized, whereas the latter cannot. Thus, *il* cannot be the focus in a cleft construction, which we can see in (24). As for (25), (25a) is well-formed because either the verb or the object receive the focus of the sentence; however, in (25b) the follow-up “and not to my sister” indicates that the pronoun should receive contrastive focus, which is not allowed. On the other hand, it is predicted that in this context, (25c) is well formed, because *a lui* is strong. In terms of focus assignment, the problem of (25) can be expressed as in (26) and (27).³

(26) a. {What do I do now?}

b. Tu [gli [SCRIVI]_F]_F

(27) a. {Do I write to Mary?}

b. # Tu [GLI]_F scrivi, e non a mia sorella.

c. Tu scrivi [A LUI]_F, e non a mia sorella.

It is not a coincidence that many languages do not have two different lexical items for the two uses and that the sole difference has to do with prosodic emphasis. Bosch mentions that transitions from deictic to anaphoric uses of pronouns are attested in Indo-European languages in a so-called “scale of decreasing independence” (cf. (28)). Also, at some stages of development, pronouns must be available for both uses. These should account for the fact that certain pronouns start out as being deictic and then lose this ability, as well as for the fact that certain pronouns have both deictic and anaphoric uses.

(28) strong pronouns → weak pronouns → syntactically-bound pronouns

³ The uneven distribution of the reflexives *zich* and *zichzelf* in Dutch has also been attributed to the pronoun’s ability to bear stress, in ?.

In the next subsection I want to propose an explanation for the distribution and semantics of *so* on the basis of the strong/weak distinction.

3.2 so_S vs. so_W

In analogy with pronouns, my claim is that there are two different but related *so*s in English (and other Germanic languages): strong *so* (so_S) and weak *so* (so_W). so_S is illustrated in (22c) (cf. ? for a semantics of the demonstrative *so* in German), and so_W , the object of this study, in (18b), (22b) and (29).

- (29) a. It's amazing that Bill is so tall.
 b. If Bill is so tall, why doesn't he join the basketball team?
 c. Is Bill really so tall?
 d. Bill hates being so tall.

In this section, I deal with examples such as (29) and leave (18b) and (22b) for the next section. Nevertheless, my purpose is to give a unitary account for all of them, the difference being that *so* is anaphoric in the former cases, while reasoning resolves the referent in the latter cases.

Below is the proposed semantics for so_W :

- (30) a. $\lambda g_{\langle e,d \rangle} \lambda x.g(x) \succeq d$.
 b. d is a familiar discourse referent.
 c. $d \succ \mathbf{stnd}(g)$.⁴

(30a) tells us that so_W is a function that takes as argument a gradable predicate (of type $\langle e,d \rangle$) and an individual, and it returns a truth value iff this individual has this property to degree d , where d is a free variable. How is d assigned a referent? (30b) says that d is retrieved from context and is identified with a previously mentioned degree. As a definite expression, it is never under the scope of an operator. I take so_S to share with so_W (30a) and (30b), but not (30c). (30c) is an additional component of the meaning of so_W that assures that d is restricted to high values. This condition is responsible for the facts in (18). That is, in using so_W , the shelf has to be high above a contextual standard, while this condition is not part of the semantics of *enough* as presented by the modal account.

(30a) is treated as the at-issue component of so_W , because it is the meaning part that can be directly denied. Consider (31):

⁴ “[...] where **stnd** is a context sensitive function that takes a gradable predicate meaning as input and returns a standard of comparison appropriate for the context as output.” (?)

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- (31) a. A: Pau is as tall as his brother Marc.
 b. B: Pau is not so tall.⁵
 c. A: That's not true. Pau is at least as tall as Marc.

Denial of *so_W* by speaker B amounts to switching the value of \succeq , as in (32):

- (32) a. $\lambda g_{\langle e,d \rangle} \lambda x. [g(x) \succeq d](\mathbf{tall})(\mathbf{p})$
 b. $\mathbf{tall}(\mathbf{p}) \succeq d$
 c. $\neg \mathbf{tall}(\mathbf{p}) \succeq d \equiv \mathbf{tall}(\mathbf{p}) \prec d$

That is why in denying B's denial, A claims that the relation between the salient degree *d* and Pau's degree of tallness is the "at least" relation. In any case, negation cannot deny the existence of *d*, which escapes its scope.

As for (30b), *so* has a familiarity presupposition, much like pronouns and other definite DPs, as analyzed by ? and ?; *so_W* takes for granted that a degree referent has been introduced in previous discourse. If this is not the case, this familiarity is usually accommodated. Take (29b), for instance. The interlocutor needs to reason that another discourse participant has claimed that Bill is tall to a certain degree.⁶ Finally, *so_W*'s familiarity presupposition includes the component in (30c), which is absent in *so_S*. This is shown in (33).

- (33) a. {Mary is 1.30 meters tall.}
 b. # Is she really *so_W* tall?

(33) is awkward because 1.30 meters tall is not above the standard of tallness for a woman.

So far, nothing in the denotation of *so_W* can explain (22a), repeated below as (34). Admittedly, (34) is possible in the reading proposed in (22c). That is, as long as *so* has a deictic use (i.e., is an instance of *so_S* and is accompanied with a pointing gesture). I want to argue that the ill-formedness of (34) can be accounted for along the lines of the b. examples in (24) and (25). *so_W* and *so_S* have familiarity presuppositions, but the former cannot be used to redirect the interlocutor's attention.

⁵ For the sake of brevity, I leave out the non anaphoric use of *so* under negation in English, which is similar to narrow-scope *very* in (1), where the relevant standard is not a familiar discourse referent but rather **stnd**. For a full-fledged analysis of *very*, cf. ?.

(1) Pau is not very tall.

⁶ Presupposition tests such as the "Wait a minute!" test are not effective here, because, as will be shown shortly, *so_W* must be backgrounded information, so this test would fare well for independent reasons.

(34) # Bill is so tall.

The restricted distribution of *so_W* has to do with its informational properties as characterized for pronouns by Bosch. *So_S* is a demonstrative, so it has deictic uses. This means that it bears the stress of the sentence (it is accented) and occurs in focus position. As such, *So_S* is used to orient the addressee's attention to a discourse referent that was not the topic the interlocutors were commenting on. Also, in line with ?, *So_S* can be said to presuppose an accompanying gesture. Note that in some dialects of English, *So_S* is being replaced by the demonstrative *this*. In certain American dialects, *yay* is the preferred expression (cf. (35)).

(35) Bill is this/yay tall. [+ pointing gesture]

On the other hand, *so_W* has anaphoric uses. Keeping with the analogy with pronouns, it is expected that it cannot bear the stress of the sentence because it is deaccented.

(22b) (repeated below for convenience) may look like an obvious counterexample, but I would like to show that it is not. Certainly, there is a special prosody on *so*, but with ?, I take this emphasis to be related to an elongation of the vowel rather than the emphasis used to focalize an item.

(36) Bill is so tall!

In fact, this lengthening does not make *so* the informational focus of the sentence or does not yield contrastive focus, as shown in (37).⁷

- (37) a. Bill is VERY brave! \rightsquigarrow ⟨a bit, quite, POS, very, extremely⟩
 b. Bill is SO brave! $\not\rightsquigarrow$ ⟨a bit, quite, POS, so, very, extremely⟩

Whereas an intensifier like *very* can be focalized and thus evoke a set of alternatives that are denied (e.g., *quite* and *extremely*), this is not possible with *so*, because the latter is not part of a scale. Consider (38):

- (38) a. Bill is VERY brave, not extremely brave.
 b. # John is SO brave, not extremely brave.

What matters for our purposes is that irrespective of whether there is stress on *so* because of lengthening, *so_W* is not the focus of the sentence. It only occurs in those contexts where its content is part of the informational background of the sentence. This is possible in interrogative, negative and if-clauses that take upon the truth of a

⁷ Where the ordering between *so* and *very* is arbitrary and \rightsquigarrow stands for “evokes”.

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previous utterance (cf. (39)), in complements of a factive predicate (cf. (40))⁸ or in non-finite clauses (cf. (41)), to mention a few cases.

- (39) A: Bill is 2 meters tall.
a. B: Is he really so tall?
b. B: No, no, he isn't so tall.
c. B: If he is so tall, why doesn't he join the basketball team?
- (40) It's amazing that Bill is so tall.
- (41) Bill hates being so tall.

An if-clause that presents a hypothetical situation that represents new information cannot include *so_W*:

- (42) # This is what we're going to do: If Bill is *so_W* tall, then he can join the basketball team; if he is as tall as Marc, then he can join the soccer team, and if he is as tall as Mary, then he should try with the golf team.

Why is (34) an ill-formed sentence of English? Because the predicate of a copular structure is the default focus of the sentence, a position that is banned for weak items. This is illustrated in (43).

- (43) {How tall is Bill?}
a. # He is [*so_W*]_F tall.
b. He is [*so_S*]_F tall.

This predicts that if a copular structure has a focused subject instead of the predicate, then the sentence should be well formed, which is borne out, as shown in (44).⁹

- (44) a. A: I heard that John is as tall as Pau Gasol.
b. B: [*BILL*]_F is so tall, not John.

Finally, in analogy with pronouns, *so* seems to be in a development stage where the two functions stand out by the difference in the set of values that *d* obtains. In languages such as Romance, there is no counterpart of *so_S* – a different lexical item is used – and in English, the demonstrative *that* may be taking over some of the uses of *so_W*, for instance in negative contexts, which can be observed in (45).

⁸ Interestingly, *so_W* cannot occur in the complement of cognitive factives. This might hint at an additional difference between the two types of factives which have already been pointed out in the literature, starting in ?.

⁹ Some speakers prefer *this* in the described scenario. Figuring out this contrast is beyond the scope of this paper.

- (45) a. {Bill is 2 meters tall}
 b. No, no, he is not that tall.

Observe that in (45), there is a previously mentioned degree that is high and that Bill does not reach.

Summing up, in this section I have proposed a denotation for so_W which shares a core semantics with so_S but which also exhibits crucial differences. To begin with, the threshold that so_S uses as a discourse referent can be any degree on a scale that can be pointed to, while so_W may only refer to high degrees. Second, along with weak pronouns, so_W can only occur in non-focused positions. This limits its distribution greatly, since we will not find so_W as the predicate of an affirmative copular structure (a recurrent position for regular intensifiers and degree words). The demonstrative so_S , on the other hand, does not impose such constraints.

4 *So ...that?*

Up to now, I have argued that we have two different so s in English, so_W and so_S . so_S is a demonstrative and can be used to refer to any degrees that can be pointed to. so_W should be able to identify the rest of instances of so . In this analysis, so holds a familiarity presupposition, which seems obvious for some cases but not so obvious for examples such as (18b) and (22b), repeated below for convenience.

- (46) a. Bill is so tall!
 b. Bill is so tall that he reaches the shelf.

However, all the examples of so_W have in common the need for the threshold to be above standard. That is why I argue that the previous cases are also instances of so_W . These do not seem anaphoric, because d is not assigned a value that has been previously mentioned, but rather, the value of d is determined via reasoning, as shall be explained shortly.

(46a) has been called “intensifying so ” by ?. In their account, intensifying so is an instance of so_S . (46a) is special in that instead of pointing to a discourse referent, it refers to a degree that is inferred from the referent of a silent demonstration gesture. One problem with this approach is that there is no mention of the high degree restriction. I will not be concerned with the compositional semantics of (46a) here, but we could speculate that the semantics of the exclamative intonation composed with the semantics of so_W can explain (46a)’s properties, in particular how the referent of the free variable d is assigned.

In this section I focus on constructions such as (46b). My claims are the following:

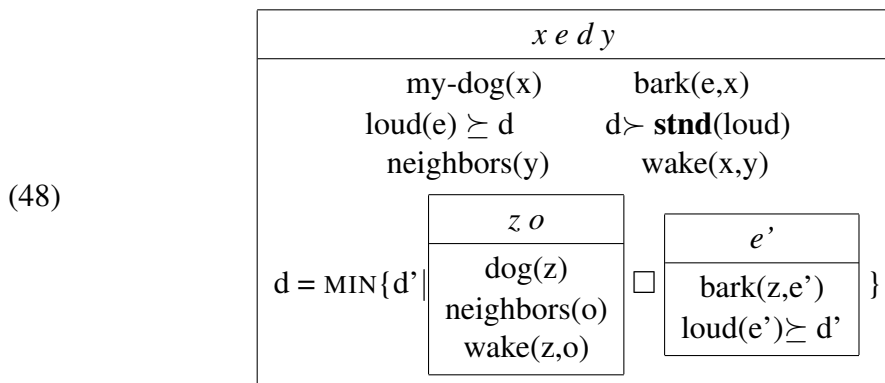
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- As an instance of so_W , so in a $so \dots that$ construction cannot bear the focus of the sentence. The $that$ -clause becomes the focus of the construction and the sentence is hence well formed from an informational perspective.
- The $that$ -clause is not so 's complement – and hence DegP internal – but rather is syntactically adjoined to the main clause.
- The two clauses are not independent (they need to update the context as a chunk). However, semantically they are coordinated.
- The referent of d is assigned via reasoning.

From now on, I will use discourse representation structures (DRSs) (cf. ? and subsequent work) to represent how the context is updated with a $so \dots that$ construction, and thus be able to represent properly such issues as phoric relations that occur beyond clause boundaries.

(48) is the proposed characterization of (17b), repeated below for convenience.

(47) My dog barked so loud that he woke up the neighbors.



The DRS in (48) is true iff there is an embedding function that can verify all the conditions in it, namely, there must be a dog x , a barking event e , a degree d that is above standard, and some neighbors y such that:

- The loudness of e must meet degree d .
- x woke y up.
- d corresponds to the maximal degree d' such that: for every world in which there is a dog z and some neighbors o and z woke o up, then z is loud to degree d' .

Observe in (48) that the two clauses are represented in the same main box; the $so \dots that$ construction is conceived as the coordination of two assertions: the assertion

that my dog barked to a certain (high) degree of loudness, and the assertion that he woke up the neighbors. The embedded boxes that determine the value of d are not spelled out as part of the *so ... that* construction. But the value of d needs to be resolved to obtain a well-formed DRS because d is [+definite]. We know that my dog barked to a certain degree of loudness and that he woke up the neighbors. To be able to interpret this DRS we have to find an embedding function that can assign values to all the variables in the universe. The joint update of the *so*-clause (*My dog barked so loud*) and the *that*-clause (*that he woke up the neighbors*) acts as a rescuing mechanism that yields the resolution of the referent of d via the following reasoning: the loudness of my dog's barking is such that if the neighbors wake up, a dog has to be barking to this degree of loudness. In other words, d is the degree of loudness that it takes for a dog to wake up the neighbors.

This kind of reasoning is also at stake in dialogs such as (49):

- (49) a. {How loud did your dog bark?}
 b. He woke up the neighbors.

In principle, accommodation should be a plausible strategy to assign a value to d , but, as shall be discussed briefly, updating the context with the *so*-clause alone yields an information structure mismatch. Since the two clauses update the context together, the reasoning proposed is the most direct means for d to get assigned a referent.

(47) can be paraphrased as (50); and from the implicatures associated with the ordering of a conjunction of related events, we can reason something like (51), which is packed in the lexical meaning of the *so ... that* construction.

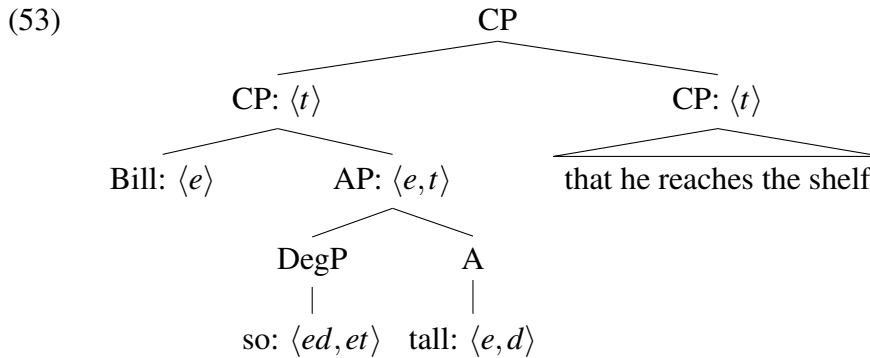
- (50) My dog barked so loud *as to wake up the neighbors* and he woke up the neighbors.
 (51) My dog barked so loud as to wake up the neighbors, and since he barked so loud, he woke them up.

Only by positing this joint update can we obtain the desired results. First, d is assigned a value. Second, imagine that what we had was two coordinated clauses.

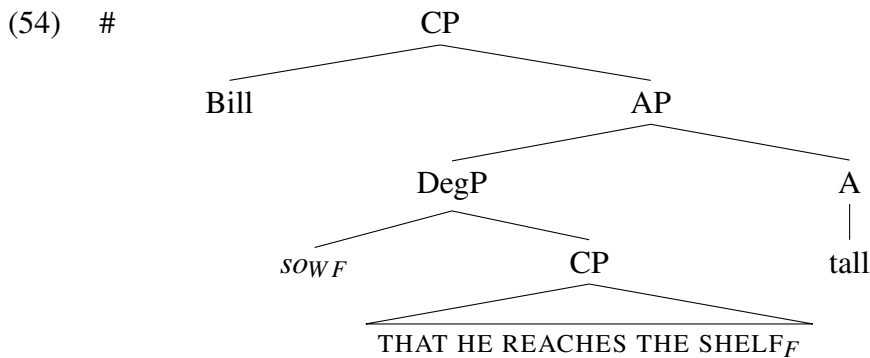
- (52) # My dog barked so loud and he woke up the neighbors.

If we accepted that the *so*-clause is first added into the context and the *that*-clause followed, we could not explain the infelicity of (52). Recall from the last section that so_W cannot occur in focus position and that the predicate of a copular construction would be such a position. The presence of the *that*-clause yields a well-formed sentence. My claim is the *that*-clause provides a focus site for the construction in such a way that so_W need not be focalized.

The two clauses are treated semantically as a sequence of (independent) propositions. However, they are syntactically bound, and from the perspective of well-formedness, the *so*-clause is dependent on the presence of the *that*-clause. The defended approach treats the *that*-clause as an adjunct of the main clause. Consider (53):



If the *that*-clause were the complement of *so* (as in (54)), it is not clear that *so*'s complement could be assigned focus but not the degree word itself. That is, we would expect that focus on the argument would trigger focus on the head (?).



A sentence with the syntax in (54) would yield an informational mismatch.

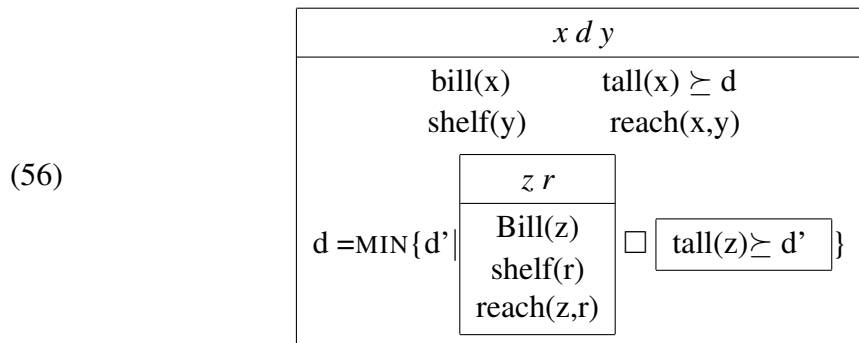
Another reason to question this kind of syntax is that the *that*-clause is discour-sively interpreted as the result or consequence of the *so* clause, and consequence is a relation between propositions.

Finally, observe the similarity between (18b) and its probable previous diachronic stage, where *so* is an instance of *so_S*.

(55) Bill is so tall: he reaches the shelf.

In (55), the relation established by the colon is not one of dependence; we have two independent clauses. Juxtaposing them is a strategy for the addressee to reason

which is the value of Bill's tallness based on what Bill can do (very much like in (49)). Hence, on the one hand, we learn that Bill reaches the shelf, and on the other hand, we deduce that his height is comparable to the height it takes to reach the shelf. As expected, (55) and (18b) have the same DRS, except for the restriction in (18b) such that $d \succ \mathbf{std}(\text{tall})$ (cf. (56)).



Let us now go back to the main differences between *so ... that* and *enough ... to*. First of all, syntactically, the *to*-clause is an argument of *enough*, while the *that*-clause is adjoined to CP to force a joint update of the two assertions.

Second, in the *enough ... to* construction, the threshold is determined by means of a modal base that contains the set of worlds in which the non-finite clause is true. In other words, the sentential complement contributes to the truth-conditional meaning of the *enough*-clause. The sentential complement is thus not an asserted sentence, as is the case for the *that*-clause. This should explain why the actuality of the complement holds only under the right conditions. Compare for instance (57) with (17a).

(57) The jet flew fast enough to beat the speed record (# but it didn't beat the speed record).

In (57), the actuality of the complement happens to be entailed, and hence the follow-up is infelicitous.

Third, the restriction to high degrees is not part of the meaning of the *enough ... to* construction. This explains why the shelf in (18a) can be any height. Again, the threshold is determined via a modal base.

Certainly, the relation established between the two degrees is \succeq in *so* and *enough*. Moreover, in a *so ... that* construction, the threshold is determined via a reasoning that involves modality. That is why, in some contexts (where the threshold is a high degree and the actuality of the complement is entailed), the *enough ... to* construction and the *so ... that* construction are interchangeable. This is even more so when the latter contains an overt *can*, as in (58).

(58) My dog barked so loud that he could wake up the neighbors.

So as a weak degree expression

In the present account, (58) states that my dog was loud to a certain high degree and that he could wake up the neighbors. On top of this, the threshold is determined via the following reasoning: the threshold met is the degree that it takes for my dog to *be able to* wake up the neighbors.

5 Conclusions

In this paper I have attempted an analysis of *so* and the *so ... that* construction that are essentially different from *enough* and the *enough ... to*-construction. In a nutshell, I have called *so_w* any instance of *so* that is not a demonstrative, and the assertion of the *that*-clause has been considered a repair strategy to avoid an information structure mismatch.

A number of issues remain unexplained. To begin with, the semantic composition of the exclamative intonation and *so_w* has to be figured out. It should be determined whether this special prosody is acting as a repair strategy and, if so, how it manages to keep *so* backgrounded.

Also, the facts presented in this paper raise a few questions regarding the diachronic development of demonstratives in English. Are *this* and *that* in a process of semantic change? How does the restriction to high degrees arise? Is the *so ... that* construction lexicalized to some extent? Can we expect that *this* or *that* replace *so* in this construction at some stage of development?

To conclude, it would be interesting to understand the behavior of *so ... that* under negation. Romance languages do not allow negation to scope over the construction, but English does as long as the *that*-clause is modalized. For instance, in (59), (59a) is less felicitous than (59b) in a plain eventive (non modal) reading.

- (59) a. ?My dog didn't bark so loud that he woke up the neighbors.
b. My children don't grow so fast that I have to buy them new clothes every now and then.

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Elena Castroviejo-Miró
 Calle Albasanz 26-28
 Centro de Ciencias Humanas y Sociales (CSIC)
 28037 Madrid (Spain)
elena.castroviejo@cchs.csic.es