Even doesn't move but associates into traces: A reply to Nakanishi 2012

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Nakanishi 2012 (*Natural Language Semantics* 20(2):115–136) presents a novel argument for the so-called "scope theory" of English VP-*even*, based on examples with antecedent-contained deletion (ACD). Nakanishi's argument is based on the assumption that *even* cannot associate with a focus which has moved out of its scope. I show that this assumption is incorrect, defusing Nakanishi's argument.

I propose that when *even* associates with a focus which has moved out of its scope, it actually associates with focused material in the lower copies of movement (trace positions). A closer look at Nakanishi's ACD examples as well as additional predictions of the scope theory then form arguments *against* the scope theory. I conclude that English VP-*even* must always be interpreted in its pronounced position. The patterns of focus association with *even* presented here constitute a new argument for the copy theory of movement.

Keywords: *even*, association with focus, scope theory of *even*, backwards association, copy theory of movement, antecedent-contained deletion

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Work on the so-called scope theory of *even* has motivated the idea that *even* in English can be interpreted at LF in a higher position than is reflected by its surface position (Karttunen and Peters 1979 and many others). The scope theory offers an attractive account of the behavior of *even* in different environments, at the cost of hypothesizing systematic and pervasive mismatches between *even*'s pronounced and interpreted positions.

In this paper, I take aim at Nakanishi 2012's argument for the scope theory from the interaction of focus association with *even* and antecedent-contained deletion (ACD). A reconsideration of the empirical landscape of focus association with *even* shows that Nakanishi's argument does not go through; furthermore, a closer look at examples of Nakanishi's form in fact form an argument against the scope theory of *even*. I argue that patterns of association with *even* are best explained by adopting the copy theory of movement with English VP-*even* consistently interpreted in its surface position.

I begin in Section 1 by summarizing the debate over the interpreted scope of *even* and then, in Section 2, I present Nakanishi's argument and necessary background assumptions. In Section 3, I show that *even* systematically associates with focused material which has moved out of its scope, in a configuration I dub *backwards association*. The availability of backwards association falsifies one of Nakanishi's assumptions, thereby undermining her argument. In Section 4, I present my proposal for focus association in such cases, where the focused constituent has moved out of the scope of *even*. In brief, adopting the copy theory of movement and associated work on the interpretation of copy chains, I propose that *even* associates with focused material in the lower copies of movement (i.e. trace positions). In Section 5, I return to Nakanishi's evidence and show that a closer look at her ACD evidence while avoiding a confound in her contexts in fact results in a new argument against the scope theory of *even*.

1 The scope theory debate

Even is a focus-sensitive operator that introduces an inference that the stated proposition in its scope, the prejacent, is less likely or more noteworthy than other alternative propositions.[1] This scalar inference of *even* is illustrated for a simple example in (1) below. Here, the association of *even* with *Syntactic Structures* leads to the inference that *Syntactic Structures* is the least likely thing for Bill to read.

(1) Bill even read [*Syntactic Structures*]$_{\text{F}}$.
$\rightsquigarrow$ For all alternatives x to *Syntactic Structures*:
$(\lambda w$. Bill read *Syntactic Structures* in $w) <_{likely} (\lambda w$. Bill read x in $w)$

A simple syncategorematic formulation for this scalar inference of *even* is given in (2) below. I use Rooth's Alternative Semantics framework for focus and its notation from Rooth 1992: for syntactic node α,

[1] Here I assume that the scalar inference of *even* can be expressed in terms of "likelihood" and assume $<_{likely}$ establishes a total ordering of propositions by their relative likelihood. See Kay (1990) for arguments that the scalar inference is that the prejacent is "more informative," or "more noteworthy" in Herburger's (2000) terms. None of the following discussion will hinge on this issue.

$[\![\alpha]\!]^o$ denotes its ordinary semantic value and $[\![\alpha]\!]^f$ denotes its focus semantic value. The addition of *even* does not affect truth conditions.[2]

(2) $[\textit{even}\ \alpha] \quad \rightsquigarrow \quad \forall\varphi \in [\![\alpha]\!]^f \setminus [\![\alpha]\!]^o\ [[\![\alpha]\!]^o <_{\textit{likely}} \varphi]$

Karttunen and Peters 1979 observes that this scalar inference of *even* is reversed in downward-entailing environments. For example, *even* in (3) below introduces an inference that *Syntactic Structures* is the most likely for Bill to read, which is the opposite of what we observed in (1). Descriptively and pretheoretically, I refer to this phenomenon as "scale reversal."

(3) **Scale reversal of *even*:**
Bill didn't even read [*Syntactic Structures*]$_{\text{F}}$.
$\rightsquigarrow$ For all alternatives x to *Syntactic Structures*:
(λw . Bill read *Syntactic Structures* in w) $>_{\textit{likely}}$ (λw . Bill read x in w) (cf 1)

Broadly two approaches have been proposed for the scale reversal of *even*. One family of proposals, called the "scope theory" of *even*, involves *even* taking wider scope at LF than its surface position indicates (Karttunen and Peters 1979; Wilkinson 1996; Guerzoni 2004; Nakanishi 2012; a.o.). For example, a scope theory analysis of example (3) would posit an LF as schematized in (4a).[3] (4b) demonstrates how this higher scope of *even* leads to the observed scale-reversed inference in (3), using the same basic formulation for *even*'s inference from (2).

(4) **Scope theory approach to (3):**
a. LF: *even* [$_\alpha$ Bill didn't read [*Syntactic Structures*]$_{\text{F}}$]
b. $[\textit{even}\ \alpha] \quad \rightsquigarrow \quad \forall\varphi \in [\![\alpha]\!]^f\ [[\![\alpha]\!]^o \setminus [\![\alpha]\!]^o <_{\textit{likely}} \varphi]$ (2)
$\Longleftrightarrow$ For all alternatives x to *Syntactic Structures*:
(λw . Bill didn't read *Syntactic Structures* in w) $<_{\textit{likely}}$ (λw . Bill didn't read x in w)
$\Longleftrightarrow$ For all alternatives x to *Syntactic Structures*:
(λw . Bill read *Syntactic Structures* in w) $>_{\textit{likely}}$ (λw . Bill read x in w) (=3)

[2]In addition to the scalar inference described here, *even* is traditionally claimed to introduce an additive inference that one of the alternatives to the prejacent is true (Horn 1969; Karttunen and Peters 1979), but the link between such an additive inference and *even* is controversial (von Stechow 1991; Krifka 1992; Rullmann 1997: see especially, recently, Wagner 2013). Here I will not review arguments for or against the scope theory from the additive part of *even* (see Nakanishi 2012: for some review) and will instead model only the uncontroversial scalar contribution of *even*.

[3]The mismatch between the PF and LF positions of *even* in the scope theory is often described as resulting from a process of covert movement, but this "movement" would not leave a semantically contentful trace (see e.g. LFs given in Wilkinson 1996, Guerzoni 2004, and Nakanishi 2012) and additionally would not obey known constraints on syntactic movement (Rullmann 1997). An alternative treatment is to associate an unpronounced, higher *even* operator with a pronounced but semantically vacuous, lower

Another approach to the scale reversal of *even*, called the *lexical ambiguity theory*, assumes two different but related, polarity-sensitive lexical entries for *even*, introducing scalar inferences in opposite directions (Rooth 1985; von Stechow 1991; Rullmann 1997; Schwarz 2005; Giannakidou 2007; a.o.). The *even* in an example such as (1) would be the positive polarity item $even_{\text{PPI}}$, with the semantics in (2),[4] whereas *even* in a downward-entailing environment such as in (3) would be an NPI variant introducing a reverse scalar inference, $even_{\text{NPI}}$. Detailed computations using the lexical ambiguity theory will be presented later.

2 Nakanishi's argument from ACD

I now introduce Nakanishi 2012's argument for the scope theory of *even*. The logic of Nakanishi's argument is roughly as follows: VP-*even* associates with a focused constituent, but we have reason to believe that this focus moves out of the surface scope of *even*. Assuming that *even* cannot associate with material which has moved out of its scope, the continued association of *even* with its intended focus—Nakanishi argues—necessitates that *even* also take scope higher than it is pronounced. As she herself highlights, this argument is noteworthy among arguments for the scope theory in not being based on the content of the inferences introduced by *even*, but from general considerations of focus association and scope.

Nakanishi's argument is based on examples with antecedent-contained deletion (ACD), a variety of VP ellipsis where the ellipsis gap is, on the surface, contained within its antecedent VP. Consider example (5) below.

(5) **Antecedent-contained deletion:**
Bill lifted every box that Mary did △. △ = "lift"

I follow Nakanishi (2012) in adopting the common approach to the resolution of ACD, first introduced by Sag (1976) and May (1985) and more recently argued for by Kennedy (1997) and Fox (2002): ACD necessitates QR of a DP containing the ellipsis site, in order to construct an appropriate antecedent VP.[5] Here I simplify the illustration, for example by not illustrating the movement of the subject from its VP-internal position. More detailed derivations involving ACD will be given in Section 5.

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even, as briefly discussed by Nakanishi (2012: 131–132) and references there. The choice between these two conceptions of the scope theory is not important for the discussion here; what is important is that there is an option by which *even* is interpreted at LF higher than indicated by its PF position. In illustrations of the scope theory here, I will simply give pairs of PF and LF representations.

[4]To be clear, the scope theory would also have to say that *even* is a PPI or similarly restricted, in order to force the wider, non-surface scope of *even* in examples such as (4).

[5]See Jacobson (2008) for presentation of an alternative view in a variable-free framework. The arguments I present in this paper for my own approach will act as a new argument against such approaches, as my proposal (in section 4) requires the presence of material in trace positions at LF, independent of their scope position. See discussion in the conclusion.

(6) **Undoing antecedent-containment in (5) via QR:**

LF: Bill PAST [[every box that Mary did △] [$_{\text{antecedent}}$ lift ___]]

An important baseline for Nakanishi's examples is example (7). Here, the ellipsis site is superficially contained within two possible antecedent VPs, but the perfect auxiliary *have* before the ellipsis site forces the ellipsis site to be interpreted as "fail to lift," corresponding to the VP labeled VP1 being the antecedent.[6] Following the approach illustrated above, this requires the DP *the box...* to QR out of VP1.

(7) **Auxiliary forcing larger VP ellipsis, higher QR:**

Bill has ... [$_{\text{VP1}}$ failed to [$_{\text{VP2}}$ lift [$_{\text{DP}}$ the box that Mary has △. ✓△ = "fail to lift"; *△ = "lifted"

With this background in place, I now turn to the crucial data presented in Nakanishi 2012. I will first concentrate on one example, reproduced here as (8) below. Nakanishi's argument is built on the structure and interpretation of the last sentence in (8).

(8) **Nakanishi 2012's example (37): scale-reversed *even* with ACD**[7]

Mary tried to lift the piano, the desk, and the box, but couldn't lift any of them. Bill said that he can lift all of them. However, he has failed to lift the piano that Mary has failed to lift, and has also failed to lift the desk that she has failed to lift. Moreover, he has failed to even lift the [box]$_{\text{F}}$ that she has △.

Let's first consider the interpretation of *even* in the last sentence. The inference of *even* here is that boxes are *more* likely or easier to lift than other items under discussion, such as the piano and desk. This makes the use of *even* in the last sentence felicitous in the context. This is the scale-reversed interpretation of *even*, which is possible here because the sentence has an NPI-licensing main verb, *fail*. Under the lexical ambiguity view, the correct interpretation of *even* comes from the use of *even*$_{\text{NPI}}$, which must be in the scope of *fail*.

The problem comes from the QR step involved to construct the correct antecedent VP. The choice of auxiliary adjacent to the ellipsis gap in (8) forces the larger ACD resolution, "fail to (even) lift."[8] In order to

[6]Some speakers accept the resolution of the ellipsis site with the lower VP, as in *lifted* in (7), even though it requires an interpreted change in verbal inflection. Hadas Kotek (p.c.) notes that this may be particularly true with focus on *has* before the ellipsis site.

[7]Nakanishi 2012 represents the F-marking in this example (her ex. 37) as on "the box," to the exclusion of the relative clause, which is not a constituent (see e.g. Partee 1973). I believe the correct representation of the intended example is with F-marking on the head noun "box" alone.

[8]Whether *even* is part of the interpreted ellipsis site is a separate issue here, which is empirically difficult to detect. I will assume here for discussion that the ellipsis resolution is "fail to *even* lift."

undo the antecedent containment of the ellipsis gap, the object "the box...," including the focused constituent, must move out of the antecedent VP. This is schematized in (9) below.

(9) **Problematic LF for (8), using the lexical ambiguity view:** (based on Nakanishi 2012: ex. 38b)
He has[PERF] [[the [box]$_F$ that she has[PERF] $\triangle$] [$_{\text{antecedent}}$ fail to *even*$_{\text{NPI}}$ lift ___]]

Assuming that focus-sensitive operators take their focus associate in their scope (the "c-command requirement" below), Nakanishi (2012) argues that this and similar data pose a problem for the lexical ambiguity theory and its assumption that *even* is interpreted in its surface position:

> "The lexical theory would say that *even* in the last sentence in (8) is an NPI, in which case *even* has to stay in the scope of *fail* at LF, as in (9). However, in this LF *even* cannot c-command the focus, and thus we would have to abandon the c-command requirement."
>
> — Nakanishi 2012: 127 (example numbers modified)

The solution, according to Nakanishi, is to embrace the scope theory of *even*. *Even* in (8) is in the surface scope of a downward-entailing operator, *fail*, and therefore under the scope theory will have an independent need to be interpreted in a higher position at LF, outside of the scope of *fail* (see footnote 4). With *even* interpreted outside of the VP headed by *fail*, QR of *the box...* to this VP edge results in the LF in (10) below. In this LF, the focused constituent *box* is in the scope of *even*, and we have successfully undone antecedent-containment for the VP ellipsis.

(10) **LF for (8) using the scope theory:** (based on Nakanishi 2012: ex. 38a)
He has[PERF] [*even* [[the [box]$_F$ that she has[PERF] $\triangle$] [$_{\text{antecedent}}$ fail to lift ___]]]

I believe the logic of Nakanishi's argument is quite strong: assuming (a) that ACD indeed requires QR to different heights to create an appropriate antecedent (see footnote 5) and (b) that the focus of *even* is not allowed to move out of its scope, then the grammaticality of examples of the form in (8) forms a unique argument for the scope theory of *even*. Unfortunately, in the next section, I will show that assumption (b) does not hold up under closer scrutiny, undermining Nakanishi's entire argument.

3 Revisiting association with *even*

Since Jackendoff 1972, focus-sensitive operators have been described as needing to c-command their focus associate. One set of Jackendoff's motivating examples are given in (11) below. This c-command requirement receives a natural explanation from the consideration of focus semantics (e.g. Rooth 1985): focus-sensitive

operators quantify over the set of focus alternatives (focus semantic value) of their complement, and therefore the meaning introduced by focus-sensitive operators should only be sensitive to the placement of focus within their scope.

(11) ***Only* must associate with a constituent in its scope:** (based on Jackendoff 1972:248–250[9])

a. * [John]$_F$ will only give his daughter a new bicycle.

b. John only will [give]$_F$ his daughter a new bicycle.

c. John only will give [his]$_F$ daughter a new bicycle.

d. John only will give his [daughter]$_F$ a new bicycle.

However, Jackendoff himself observed a wrinkle to this generalization: English adverb *even*, unlike *only*, is able to associate with a leftward subject, as in (12). Jackendoff only discusses this complication with subjects, but the same contrast is observed with leftward topics, as in (13).

(12) ***Even* but not *only* can associate with a leftward subject:** (based on Jackendoff 1972:248–250)

a. * [John]$_F$ will only give his daughter a new bicycle.

b. ✓ [John]$_F$ will even give his daughter a new bicycle.

(13) ***Even* but not *only* can associate with a leftward topic:**

a. * [John]$_F$, they only consider ___ intelligent.

b. ✓ [John]$_F$, they even consider ___ intelligent. (Kayne 1998: fn. 75)

I refer to such configurations where *even* associates with a constituent outside of its surface scope as *backwards association*.

At the same time, it's not the case that focus association with *even* is completely unrestricted. Nakanishi 2012 gives example (14) as an illustration that *even* cannot generally associate with a focus outside of its surface scope—here the subject of a higher clause.

(14) **Association with *even* is not completely unconstrained:** (Nakanishi 2012: ex. 21)

* [John]$_F$ said that Bill even read *Syntactic Structures*.

I propose the following descriptive generalization for the availability of backwards association with *even*, which accounts for the observed contrasts:

[9]Jackendoff's original examples are modified here by adding the auxiliary *will* before *only*. This avoids a confound that some speakers allow a postnominally adjoined *only*, allowing an alternative, grammatical parse for subject *John only* in example (a) without *will*. See also footnote 2 in Beaver and Clark 2008:161 for a note to this same effect.

(15) **Generalization: Backwards association with *even***

Even can associate with a focused constituent α which is outside of *even*'s scope if and only if α originated within *even*'s scope and then moved out.

Even in (12–13) successfully associates with the leftward focus because the focus was moved out of *even*'s scope. For example (12), the relevant movement is from the VP-internal base position of the subject. In contrast, the intended association with *even* is impossible in (14) because the matrix subject *John* was base-generated in the matrix clause, outside of the scope of the embedded *even*. There is no point in the derivation where *John* is in the scope of *even*.[10]

The relevance of this generalization in (15) for Nakanishi's argument is clear. Her argument for the scope theory of *even*, reviewed in the previous section, explicitly assumes as a premise that *even* is unable to associate with material which has moved out of its scope. A more careful look at the distribution of association with *even*, however, shows that *even* can in fact associate with material outside of its surface scope, precisely in cases where the focus has moved out of the scope of *even*.

In section 4, I will detail my proposal for the semantics of *even* and the syntax/semantics of movement which derives this empirical generalization in (15), while preserving the standard Roothian semantics for focus, where focus-sensitive operators quantify over focus alternatives in their scope. In brief, I adopt the copy theory of movement (Chomsky 1993; a.o.) and propose that when *even* associates backwards, it is actually associating with the focused material in the (unpronounced) lower copy of movement, within its scope. But first, in the remainder of this section, I will further motivate the generalization in (15) and argue against a few alternative characterizations, including the use of the scope theory itself for backwards association configurations.

3.1 The importance of the lower position of movement

In this subsection I present additional motivation for the generalization in (15). In particular, I show that the presence or absence of a lower, base position of movement (trace position) for a constituent containing the focus inside the surface scope of *even* determines the availability of the intended focus association.

I begin with examples of association with a leftward topic, as in (13), but systematically controlling the position of *even* and the base position of the topic. Starting with the baseline sentence in (16), I cross these two factors, resulting in the four variants in (17). The intended association with *even* is judged as ungrammatical in just one of these variants, where the base position of the topic is not within the surface scope of *even*, as predicted by the generalization in (15).[11]

[10]Reference to the derivational history here and in (15) is simply a helpful conceptual device: what ultimately matters, I argue, is the LF representation.

[11]The contrast in (17) also serves to rule out an alternative analysis where *even* somehow has an option to associate with a topic instead of a focus. See for example a suggestion of this sort for leftward association with *also* in Krifka 1998.

(16) Baseline: The report convinced the judges that we spied on the Canadians.

(17) ***Even* with leftward topic focus needs base position in scope:**

a. ✓ The [Canadians]$_F$, the report *even* convinced the judges that we spied on ___.

b. ✓ The [Canadians]$_F$, the report convinced the judges that we *even* spied on ___.

c. ✓ The [judges]$_F$, the report *even* convinced ___ that we spied on the Canadians.

d. * The [judges]$_F$, the report convinced ___ that we *even* spied on the Canadians.

An alternative characterization for the pattern in (17) would be to say that *even* must precede the gap associated with the leftward topic. Example (18) shows that the correct generalization is structural rather than linear.

(18) ***Even* linearly preceding the gap is not sufficient:**

* The [judges]$_F$, [for the report to *even* impress me] would annoy ___. (David Pesetsky, p.c.)

A further argument for the importance of a lower position of movement inside the scope of *even* comes from the contrast between raising and control in (19). Adverb *even* in the nonfinite embedding is able to associate with the leftward subject across the raising verb, *seem*, but not across the control verb, *want*.

(19) **A contrast between subject raising and control:**

a. ✓ A [professor]$_F$ seems to even be at the party. *raising*

b. * A [professor]$_F$ wants to even be at the party. *control*

Assuming that the subject in (19a) is base-generated in the complement of *seem* and moved to its surface position, but that the control construction in (19b) does not involve such movement (see e.g. Culicover and Jackendoff 2001), the contrast here further motivates the generalization in (15). In the derivation of (19a) but not (19b)—illustrated schematically in (20) below—the focused constituent *professor* originated in the scope of *even*.

(20) **Derivations explaining the contrast in (19):**

a. ✓ [A [professor]$_F$] seems to *even* [___ be at the party].

b. * [A [professor]$_F$]$_i$ wants to *even* [PRO$_i$ be at the party].

3.2 It's not obligatory syntactic reconstruction

Having established that the focus associate originating within the scope of *even* is crucial for backwards association, we might imagine that focus association in such cases involves syntactic reconstruction. That is, even though the focused constituent is not in the scope of *even* at PF, the moved constituent is interpreted

under reconstruction within its scope at LF. Such an approach is in fact suggested as a possibility in Kayne (1998: fn. 75). This possibility is schematized here:

(21) **One possible approach: syntactic reconstruction**

a. PF: [A [professor]$_F$] will [*even* [___ come to the party]]

b. LF: FUT [*even* [[a [professor]$_F$] come to the party]]

This approach predicts that the reconstructed phrase will necessarily be interpreted in a lower position. Consider then example (22), where the moved constituent containing focus is the quantificational DP *every student*. If syntactic reconstruction is necessary for association of *even* with *student*, we predict *every student* to be within the scope of negation at LF,[12] resulting in obligatory inverse scope: *not* > *every*. This prediction is not borne out. Consider the two supporting contexts in (22a–b) below, which support the two readings.

(22) **Subject association with *even* is compatible with different scopes for the subject:**
Every [student]$_F$ didn't *even* come to the party. $^{\checkmark}\forall > \neg$, $^{\checkmark}\neg > \forall$

a. $^{\checkmark}\forall > \neg$: ⇒ No student came.
We planned a party with free food. We expected at least some students to come, because they love free food, but we didn't particularly expect professors to come. No one attended the party. We weren't surprised that every professor didn't come ($\forall > \neg$). What surprised us, though, is that every [student]$_F$ didn't *even* come to the party.

b. $^{\checkmark}\neg > \forall$: ⇒ Not every student came, but some may have.
We planned a party with free food. We expected all the students to come, because they love free food, but we didn't expect all the professors to come. Not all of the students came and not all of the professors came. We weren't surprised that every professor didn't come ($\neg > \forall$). What surprised us, though, is that every [student]$_F$ didn't *even* come to the party.

What is important here is the availability of the surface scope interpretation in (22). This shows that backwards association with *student* does not force reconstruction of the subject *every student* as schematized in (21) above. Although backwards association requires the focus to have originated within the scope of *even*, it must not be dependent upon the moved constituent taking scope within *even*.

I note as well that an obligatory reconstruction approach would be unable to account for the ACD examples from Nakanishi, unlike my own proposal in section 4.

[12]This is assuming that the surface position of *even* reflects its position at LF. I discuss the possibility of using the scope theory of *even* to account for backwards association in section 3.3 below.

3.3 The scope theory doesn't help with backwards association

So far in this section I have claimed that *even* possesses the puzzling ability to associate with a focus outside of its scope, under specific circumstances. We might consider such data to be less puzzling if *even* has the ability to take wider scope at LF than its surface position would indicate. This is, in essence, the scope theory of *even*, which has been motivated by the behavior of *even* in downward-entailing contexts (section 1). In this subsection I discuss the potential application of the scope theory to explain backwards association with *even*.

Consider a simple example of backwards association as in (23). Using the scope theory as presented in Nakanishi 2012, we assume that *even* can be interpreted in a higher position at LF, and can associate with any focus in this LF scope—even one which was not in its surface scope.[13] The LF in (23b) then allows for the grammatical association of *even* with the focus *professor* which is outside of its surface scope (23a).

(23) **Backwards association via the scope theory:**

a. PF: A [professor]$_F$ will even come to the party.

b. LF: *even* [[a [professor]$_F$] will come to the party]

The primary problem with such an approach is that it does not predict the sensitivity to the presence or absence of a trace position for the focus within the surface scope of *even* (generalization (15)) which I have motivated above. Concretely, consider the examples (17b,d), reproduced here in (24) with hypothetical scope theory LFs.

(24) **Scope theory LFs for gramamtical and ungrammatical backwards association with topics:**

a. ✓ The [Canadians]$_F$, the report convinced the judges that we *even* spied on ___. (=17b)
Scope theory LF: *even* [the [C's]$_F$, λx the report convinced the judges that we spied on x]

b. * The [judges]$_F$, the report convinced ___ that we *even* spied on the Canadians. (=17d)
Scope theory LF: *even* [the [judges]$_F$, λx the report convinced x that we spied on the C's]

Let's assume that the scope theory of *even* is the mechanism by which *even* associates backwards in (24a). This means that *even* pronounced at the embedded VP edge can be interpreted at LF in a position taking

[13] It's worth noting that not all presentations of the scope theory of *even* make this prediction, that *even* can associate with focused constituents in *even*'s LF scope which are not in its surface scope. For example, Wilkinson 1996 proposes that "since *even* in the Infl of a lower clause [MYE: adjoined to an embedded clause's VP] cannot associate with a focused element in a higher clause (or with anything that it does not c-command at S-structure), on the scope theory, the item that a focusing adverb associates with has to be coindexed with the adverb at S-structure" (p. 199). In other words, *even* is required to fix its focus associate based on its pronounced position, in contrast to Nakanishi's characterization. As we have already seen, however, this mechanism too cannot be correct, as it is empirically false that *even* "cannot associate... with anything that it does not c-command at S-structure." Here I will concentrate on Nakanishi's conception of the scope theory.

the focused *Canadians* in its scope. By this same mechanism, however, we would predict that *even* in (24b) should be able to associate with the focused *judges* at LF. This contrast again highlights the sensitivity of backwards association to the lower, trace position of movement, which is unpredicted by this scope theory-based account for backwards association.

The scope theory advocate might push back at this point, to say that the displacement of *even* in (24) is unmotivated. After all, the motivation for the scope theory is the derivation of *even*'s scale reversal behavior in downward-entailing contexts; we could imagine that *even* is only allowed to take wider scope at LF if it is within the surface scope of a displacement-licensing operator.[14] But the situation is even worse for the scope theory: the wide scope interpretation of *even* necessitated for the derivation of its scale reversal behavior also makes incorrect predictions about *even*'s backwards association behavior.

I will present this argument based on the contrast observed between raising and control embeddings in (19) above. Consider the examples in (25), which are modified from (19) so that the head of the matrix subject is *no*, whose nuclear scope is downward-entailing and therefore licenses the scale reversal of *even*. Under the scope theory, *even* is predicted to be interpreted outside of the scope of *no* at LF, as illustrated for each example in (25). This predicts that *even* will take the focus *student* in its scope at LF in the grammatical example (25a), but also in the ungrammatical (25b).

(25) **Scope theory incorrectly predicts no contrast between raising and control:**

a. ✓ No $[\text{student}]_F$ seems to *even* be at the party. (cf 20a)
Scope theory LF: *even* [no $[\text{student}]_F$ λx seems [x to be at the party]]

b. * No $[\text{student}]_F$ wants to *even* be at the party. (cf 20b)
Scope theory LF: *even* [no $[\text{student}]_F$ λx . x wants [PRO_x to be at the party]]

We can verify that the wide scope of *even* hypothesized in (20b) is independently predicted to be possible by the scope theory, by checking for scale reversal behavior in similar configurations. Consider example (26), where *even* is similarly pronounced at PF at the edge of a control embedding, with a matrix negative quantificational subject. The inference of *even* in (26) is the scale-reversed inference that it is *more likely* to read the abstract of a terrible paper than its other parts. Under the scope theory, this must be because *even* is interpreted above the matrix subject, as illustrated in (26).

(26) ✓ No one wants to *even* read the $[\text{abstract}]_F$ of this terrible paper.
Scope theory LF: *even* [no one λx . x wants [PRO_x to read the $[\text{abstract}]_F$ of this terrible paper]]

The grammatical, scale-reversed interpretation in (26) thus shows that the scope theory LF illustrated in (25b) should hypothetically be possible under the scope theory. The contrast in grammaticality between the

[14] In this case, we would also expect the scope theory advocate to offer an alternative explanation for backwards association with *even* in (24a) but not (24b).

raising example (25a) and the control example (25b) therefore acts as an argument against the scope theory of *even*.

I conclude that the scope theory of *even*—the proposed ability for *even* to be interpreted higher than its pronounced position—cannot be the source of backwards association with *even*. This approach fails to predict the empirical generalization in (15): that backwards association requires the focused material to originate within the *surface scope* of *even*. Furthermore, I demonstrated that Nakanishi's conception of the scope theory, where *even* is able to associate with any constituent in its interpreted scope at LF (cf footnote 13), would systematically overgenerate instances of backwards association.

4 Proposal: Association with focus in the lower copy of movement

I will now present my proposal for the ability of *even* to associate with some foci outside of its surface scope. As I have shown in the previous section, such backwards association is possible only if the focused constituent originated within the surface scope of *even*. I will then return to discussion of ACD and Nakanishi's argument for the scope theory in section 5.

The core intuition of my proposal is that movement involves copying of syntactic objects (the copy theory of movement; Chomsky 1993; a.o.) and that lower copies of F-marked material also contribute to the computation of focus alternatives. In cases of apparent backwards association, *even* is actually associating with the lower copy of focus, inside the scope of *even*, even if this material is unpronounced at PF. This is illustrated schematically below:

(27) **Backwards association by copying F-marking:**

a. Narrow syntax: [... α_F ...] ... [*even* [... [... α_F ...] ...]]

b. LF: [... α_F ...] ... [*even* [... [... α_F ...] ...]] — *even* associates with the circled focus

c. PF: [... α_F ...] ... [*even* [... ~~[... α_F ...]~~ ...]] — (for overt movement)

The phenomenon of "backwards association" is, then, a sort of illusion. There is nothing special about the mechanism of focus association with *even*: *even* straightforwardly quantifies over the focus alternatives computed for its complement, just as any other focus-sensitive operator does.[15]

I furthermore propose that English adverb *even* is always interpreted in its pronounced position. This is an explicit rejection of the scope theory as applied to English adverb *even*. For the scale reversal behavior of *even* in downward-entailing environments, I adopt the lexical ambiguity view. *Even*s in downward-entailing

[15]This characterization then raises the question of why *only* cannot associate backwards as *even* can, as we observed in section 3. See footnote 18 below.

environments are interpreted as the scale-reversed *even*$_{\text{NPI}}$, whereas other *even*s are the PPI *even*$_{\text{PPI}}$.[16]

I will illustrate this proposal through the basic example of backwards association in (28) below. I assume the subject *no student* is base-generated in a VP-internal position, within the scope of *even*, and then moves to its surface position (28a). When movement is thought of as copying, the resulting copy-chain must be modified to be interpretable. I adopt the mechanism of Trace Conversion (TC; Rullmann and Beck 1998; Sauerland 1998; Fox 2002) whereby lower copies of DP copy-chains are turned into bound variable definite descriptions. The resulting LF is given in (28b). Because *even* does not affect truth conditions, the at-issue content of (28) will be computed straightforwardly from (28b).

(28) **A simple example of backwards association:**

"No [student]$_{\text{F}}$ will even come to the party."

a. Narrow syntax:

[No [student]$_{\text{F}}$] FUT even [no [student]$_{\text{F}}$] come to the party

b. LF after Trace Conversion:

[No [student]$_{\text{F}}$] λx FUT *even*$_{\text{NPI}}$ [[the [student]$_{\text{F}}$ x] come to the party]

In brief, Trace Conversion involves the replacement of the lower copy's quantificational material with the definite determiner *the* and modification of the lower copy's restriction with a predicate of being equal to the variable that is then abstracted; see Fox 2002 for a more detailed presentation. Note here that there are two instances of the NP restrictor *student* in the LF representation. I assume that the syntactic annotation of F-marking (Jackendoff 1972) is preserved on both copies.

Now consider the interpretation of *even* in (28b). Because it is in a downward-entailing environment—the scope of *no student*—it will be the scale-reversed *even*$_{\text{NPI}}$. Let's assume that the only contextually-relevant alternative to the F-marked predicate *student* is *professor*: $[\![\text{[student]}_{\text{F}}]\!]^f = \{\lambda x\ .\ x \text{ is a student}, \lambda x\ .\ x \text{ is a professor}\}$. The focus semantic value of the complement of *even*$_{\text{NPI}}$, $[\![\text{VP}]\!]^f$, is then as in (29), with the first alternative being the prejacent value, $[\![\text{VP}]\!]^o$. Note that the definite description of the form *the NP x* has the same referent as x but with the presupposition that x satisfies *NP*; we unpack this presupposition properly in the second line of (29).

(29) **Focus alternatives in the scope of *even*$_{\text{NPI}}$:**

$$[\![\text{VP}]\!]^f = \left\{ \begin{array}{l} \lambda w\ .\ \text{the student } x \text{ comes to the party in } w, \\ \lambda w\ .\ \text{the professor } x \text{ comes to the party in } w \end{array} \right\}$$

[16] Note however that the discussion in this current paper does not universally dismiss the possible application of the scope theory for other languages, nor do I discuss the behavior of English constituent-marking *even*s.

$$= \left\{ \begin{array}{l} \lambda w : x \text{ is a student } .\ x \text{ comes to the party in } w, \\ \lambda w : x \text{ is a professor } .\ x \text{ comes to the party in } w \end{array} \right\}$$

Two features of this set of alternatives deserve mention. First, we see that the two alternatives in $[\![\text{VP}]\!]^f$ differ only in the presuppositions that they carry—namely, x being a student or x being a professor—but express the same at-issue content, the proposition that x comes to the party. Intuitively, we want these presuppositional contents to count towards the scalar inference of *even*. I propose that, within the evaluation of *even*, each alternative is modified using local accommodation (Heim 1983)—or the A-operator of Beaver and Krahmer 2001—converting their presuppositional content to be part of their truth conditions:[17]

(30) **Local accommodation (LA):**

$\text{LA}(\varphi) \equiv \lambda w\ .\ \varphi$ is defined (its presuppositions are satisfied) in w and $\varphi(w)$ is true

(31) a. $[\textit{even}_{\text{PPI}}\ \alpha] \rightsquigarrow \forall \varphi \in [\![\alpha]\!]^f \setminus [\![\alpha]\!]^o\ (\text{LA}([\![\alpha]\!]^o) <_{\textit{likely}} \text{LA}(\varphi))$

b. $[\textit{even}_{\text{NPI}}\ \alpha] \rightsquigarrow \forall \varphi \in [\![\alpha]\!]^f \setminus [\![\alpha]\!]^o\ (\text{LA}([\![\alpha]\!]^o) >_{\textit{likely}} \text{LA}(\varphi))$

Second, we note that each alternative in $[\![\text{VP}]\!]^f$ includes an unbound variable (x). The corresponding variable in the at-issue content will be bound by the λ-binder corresponding to the movement of the subject, but the scalar inference of *even* does not compose with material above it.[18] The scalar inference of *even* in (28)—using the scale-reversed $\textit{even}_{\text{NPI}}$, as we are in a downward-entailing environment—is predicted to be as in (32). This resulting scalar inference then also includes the unbound variable x:

(32) **Scalar inference computed by $\textit{even}_{\text{NPI}}$ (31b):**

$[\textit{even}_{\text{NPI}}\ \text{VP}] \rightsquigarrow (\lambda w\ .\ x \text{ is a student and comes to the party in } w) >_{\textit{likely}}$
$(\lambda w\ .\ x \text{ is a professor and comes to the party in } w)$

The question of how such a meaning is interpreted globally is the concern of the so-called *projection problem* of non-truth-conditional content in quantificational contexts. This problem has been discussed extensively; see for example discussion in Karttunen and Peters 1979; Cooper 1983; Heim 1983; van der Sandt 1992; Beaver and Krahmer 2001. See also Sudo 2014 for a recent review. Our concern here is the projection behavior when the variable is bound by a negative existential—in this case *no professor*. In such cases, Cooper 1983 argues that non-truth-conditional content projects universally over the relevant domain,

[17] Alternatively, we could clarify the definitions of $<_{\textit{likely}}$ and $>_{\textit{likely}}$ in the denotations of *even* as comparing likelihoods of being defined (having presuppositions satisfied) and being true, instead of simply the the likelihoods of being true. I choose to describe this as an application of local accommodation, however, in order to make this aspect of the proposal more explicit.

[18] Here lies the key difference between *even* and *only*, resulting in the inability of *only* to associate "backwards" as *even* does. *Only* uses focus alternatives to generate at-issue content, and therefore such variables in the truth conditions introduced by *only* will be bound by their higher copies. I show in Erlewine 2014b that this configuration with *only* necessarily results in a logical tautology or contradiction, and is therefore not a contingent and useful semantic object. See section 4.3 of Erlewine 2014b for a detailed presentation.

and this has been verified experimentally by Chemla (2009). This predicts the global effect of the scalar inference introduced by $even_{\text{NPI}}$ to be as in (33).

(33) **The projected scalar inference of $even_{\text{NPI}}$ for (28):**

$$\rightsquigarrow \forall x \left(\begin{array}{c} (\lambda w \ . \ x \text{ is a student and comes to the party in } w) >_{likely} \\ (\lambda w \ . \ x \text{ is a professor and comes to the party in } w) \end{array} \right)$$

If we think about the likelihood ordering $>_{likely}$ as reflecting probabilities associated with these propositions, we can simplify the content of (33):[19]

(34) **The scalar inference in (33) in probabilistic terms:**

$$\begin{aligned} &\rightsquigarrow \forall x \ (P(x \text{ is a student and comes to the party}) > P(x \text{ is a professor and comes to the party})) \\ &\iff \forall x \left(\begin{array}{c} P(x \text{ is a student} \mid x \text{ comes to the party}) \times P(x \text{ comes to the party}) > \\ P(x \text{ is a professor} \mid x \text{ comes to the party}) \times P(x \text{ comes to the party}) \end{array} \right) \\ &\iff \forall x \ (P(x \text{ is a student} \mid x \text{ comes to the party}) > P(x \text{ is a professor} \mid x \text{ comes to the party})) \\ &\iff \forall x \ (x \text{ comes to the party} \rightarrow P(x \text{ is a student}) > P(x \text{ is a professor})) \end{aligned}$$

In other words, the content of the project scalar inference of (33) can be paraphrased as follows: for any individual x, if they come to the party, they are more likely to be a student than to be a professor. This reflects the observed inference of *even* in (28), that it is more likely for students to come to parties than for professors to.

The discussion of example (28) in this section demonstrates that the ability of *even* to associate "backwards" falls out as a natural consequence of the adoption of the copy theory of movement and associated work on the interpretation of copy-chains. In particular, this approach derives the empirical generalization (15) observed in section 3 above: when *even* appears to associate with material outside of its surface scope, it is actually associating with a lower copy of the focus within its scope; therefore backwards association is impossible if the focus did not originate within the surface scope of *even*.

I furthermore proposed that English adverb *even* is consistently interpreted in its pronounced position. We already saw in section 3.3 above that the adoption of the scope theory of *even* would incorrectly predict the availability of backwards association in a range of configurations where it is in fact unavailable. Instead of the scope theory, I adopt the lexical ambiguity theory for the scale-reversal behavior of *even*. This was demonstrated in the discussion of example (28), where *even* was the scale-reversed $even_{\text{NPI}}$, resulting in the correct scalar inference.

[19]The notation $P(A \mid B)$ is the conditional probability of event A given event B. $P(A \mid B) = \frac{P(A \text{ and } B)}{P(B)}$.

5 ACD and the scope of *even*

I now return to Nakanishi 2012's argument from antecedent-contained deletion (ACD) for the scope theory of *even*. As I reviewed in section 2, Nakanishi's argument is logically sound but assumes as a premise that *even* is unable to associate with a focus which has moved out of its scope. I have already shown in section 3 that this assumption is empirically incorrect. In this section I will show that my own proposal for focus association in such configurations, from section 4, together with the copy-theoretic approach to ACD from Fox 2002, can correctly account for focus association with *even* in Nakanishi's crucial examples without invoking the scope theory. Furthermore, the investigation of additional configurations of *even* with ACD in fact forms a new argument *against* the scope theory. I will conclude with a discussion of the status of some judgments in Nakanishi 2012, which appear to conflict with the new argument I present here.

Fox 2002 presents a copy-theoretic analysis of ACD, based on earlier ideas from Baltin 1987, Sauerland 1998, Fox and Nissenbaum 1999, a.o. This proposal will be important to my account of Nakanishi's ACD data. I will illustrate this approach using the basic ACD example in (5), repeated below as (35). In section 2 above I introduced the common idea that QR of a DP containing the ellipsis is involved in the ACD (Sag 1976; May 1985: a.o.). This is sketched in the LF in (6), repeated below as (36).

(35) **Antecedent-contained deletion:** (=5)
Bill lifted every box that Mary did △. △ = "lift"

(36) **Undoing antecedent-containment in (35) via QR:** (=6)
LF: Bill PAST [[every box that Mary did △] [$_{\text{antecedent}}$ lift ___]]

The intuition behind (36) is that QR of *every box...* takes the ellipsis site out of the antecedent VP, undoing the antecedent-containment problem. It is also supported empirically by facts regarding the scope of quantificational DPs hosting ACD: see Sag 1976 and Williams 1977. However, as noted by Fox (1995, 2002), this approach is incompatible with the copy theory of movement: if QR in (36) leaves a copy in the trace position, a copy of the ellipsis site will remain in the antecedent VP as well. QR would not actually resolve the antecedent-containment problem.

Fox 2002 then proposes a new approach to ACD using the copy theory of movement. Following an intuition from work such as Baltin 1987, that the relative clause containing the ellipsis site is extraposed, Fox proposes that the relative clause is late-adjoined to a QRed DP (see Lebeaux 1988; Fox and Nissenbaum 1999): here, *every box*. This approach is illustrated here for example (35):[20]

[20]Movement of the subject *Bill* out of its VP-internal position is not shown here.

(37) **Apparent ACD in (35) through late-adjunction of the relative clause, following Fox 2002:**

a. QR of the object "every box":
Bill PAST [[every box] [$_{VP}$ lift [every box]]]

b. Late merger of relative clause (adjunct):
Bill PAST [[every box [that Mary did Δ]] [$_{VP}$ lift [every box]]]

c. PF pronouncing lower copy of the DP and eliding the VP in the relative clause:[21]
Bill PAST [[$_{VP}$ lift [every box]] [~~every box~~ [that Mary did Δ]]]

d. LF after Trace Conversion:
Bill PAST [[every box [that Mary did Δ]] λx [$_{VP}$ lift [the box x]]]

Under this approach, illustrated in (37), there is in fact no antecedent-containment: the elided VP is introduced by late-adjunction of the relative clause, outside of the antecedent VP. At the same time, this proposal takes advantage of the copy theory of movement: the lower copy of the DP is pronounced as *every box* at PF, while it is converted into a definite description *the box x* at LF. This lower copy definite description is part of the antecedent VP, requiring that the elided VP also contain a matching *box* bound variable object; see Kennedy 1997; Sauerland 1998, 2004 for empirical evidence of this restriction. Fox's approach additionally explains a number of other restrictions on ACD as well as its interaction with Binding Condition C. I refer the reader to Fox 2002 for details.

With this background on the copy-theoretic approach to ACD in place, I now revisit Nakanishi's argument against the lexical ambiguity theory. One of her crucial examples is repeated here from (8) above:

(38) **Nakanishi 2012's example (37):** (=8)
He has failed to even lift the [box]$_F$ that she has △.

Her argument is again as follows: The DP *the box...* must QR out of the antecedent VP *fail to...*, and this means the F-marked constituent *box* will be outside of the surface scope of *even*. *Even* is in a downward-entailing environment here and, under the lexical ambiguity theory, it must be interpreted as the scale-reversed *even*$_{NPI}$ in its surface position, within the scope of the licensor *fail*. The resulting LF, according to Nakanishi (ex. 38b), is as in (39) below. Nakanishi draws our attention to the fact that there is no F-marked constituent in the scope of *even*$_{NPI}$ in the LF representation illustrated in (39).

(39) **Nakanishi's problematic lexical ambiguity theory LF for (8):** (=9)
He has[PERF] [[the [box]$_F$ that she has[PERF] △] [$_{VP}$ fail to *even*$_{NPI}$ lift ___]]

[21] Following Fox and Nissenbaum 1999, Fox 2002 conceives of the original QR step in (37a) as rightward movement. Late-adjunction of the relative clause to this position will then be naturally linearized to the right of the VP, rather than its left. Here I illustrate all movements as to the left, but then illustrate just this PF representation with ~~*every box*~~ *that Mary...* linearized to the right.

But Nakanishi's challenge is easily resolved by adoption of the derivation of ACD argued for by Fox (2002), which leaves a copy of the head DP *the box* in its base position. This derivation of example (38) under Fox 2002's approach is illustrated here:

(40) **Derivation of (8) using Fox 2002's copy-theoretic approach to ACD:**

a. QR of the object "the box":
Bill has[PERF] [[the [box]$_F$] [$_{VP}$ failed to *even*$_{NPI}$ [PRO lift [the [box]$_F$]]]]

b. Late merger of the relative clause (adjunct):
Bill has[PERF] [[the [box]$_F$ [that Mary has[PERF] △]] [$_{VP}$ failed to *even*$_{NPI}$ [PRO lift [the [box]$_F$]]]]

c. LF after Trace Conversion:
Bill has[PERF] [[the [box]$_F$ [that Mary has[PERF] △]]
λx [$_{VP}$ failed to *even*$_{NPI}$ [$_\alpha$ PRO lift [the [box]$_F$ x]]]]

As I proposed in section 4, *even* is able to safely associate with a focus in a lower copy of movement, computing its scalar inference using the focus alternatives in its scope. Here assume that the alternatives to *box* are *piano* and *desk*, as supported by the context given in (8): $[\![\text{box}]\!]^f = \{\text{box, piano, desk}\}$. Here the alternatives in the scope of *even*$_{NPI}$ are as in (41), where the first alternative is the prejacent value $[\![\alpha]\!]^o$. The PRO subject of the control embedding is represented by the variable y below.

(41) **Focus alternatives in the scope of *even*$_{NPI}$ (α) in (40):**

$$[\![\alpha]\!]^f = \left\{ \begin{array}{l} \lambda w \text{ . } y \text{ lifts the box } x \text{ in } w, \\ \lambda w \text{ . } y \text{ lifts the desk } x \text{ in } w, \\ \lambda w \text{ . } y \text{ lifts the piano } x \text{ in } w \end{array} \right\} = \left\{ \begin{array}{l} \lambda w : x \text{ is a box . } y \text{ lifts } x \text{ in } w, \\ \lambda w : x \text{ is a desk . } y \text{ lifts } x \text{ in } w, \\ \lambda w : x \text{ is a piano . } y \text{ lifts } x \text{ in } w \end{array} \right\}$$

Even$_{NPI}$ will have access to these ordinary and focus semantic values at α, applying local accommodation (30) and resulting in the local scalar inference in (42a). This inference includes the open variables x and y, so we must again consider the projection behavior of this not-at-issue meaning. Following the discussion in section 4, I assume that both variables project universally, yielding the inference in (42b).

(42) **Computing the scalar inference of *even*$_{NPI}$ in (38):**

a. The scalar inference at α in (40c):

$$\begin{aligned} [\textit{even}_{NPI}\ \alpha] \quad &\rightsquigarrow \quad \forall \varphi \in [\![\alpha]\!]^f \setminus [\![\alpha]\!]^o \ (\text{LA}([\![\alpha]\!]^o) >_{\textit{likely}} \text{LA}(\varphi)) \qquad (=31b) \\ &\iff (\lambda w \text{ . } x \text{ is a box and } y \text{ lifts } x \text{ in } w) >_{\textit{likely}} (\lambda w \text{ . } x \text{ is a desk and } y \text{ lifts } x \text{ in } w) \wedge \\ &\quad\ (\lambda w \text{ . } x \text{ is a box and } y \text{ lifts } x \text{ in } w) >_{\textit{likely}} (\lambda w \text{ . } x \text{ is a piano and } y \text{ lifts } x \text{ in } w) \end{aligned}$$

b. The projected inference of *even*$_{NPI}$:

$$\rightsquigarrow \forall x, y \left(\begin{array}{l} (\lambda w \text{ . } x \text{ is a box and } y \text{ lifts } x \text{ in } w) >_{\textit{likely}} (\lambda w \text{ . } x \text{ is a desk and } y \text{ lifts } x \text{ in } w) \wedge \\ (\lambda w \text{ . } x \text{ is a box and } y \text{ lifts } x \text{ in } w) >_{\textit{likely}} (\lambda w \text{ . } x \text{ is a piano and } y \text{ lifts } x \text{ in } w) \end{array} \right)$$

This gives us the correct, scale-reversed inference of *even* in (38): it is more likely for boxes to be picked up than for desks or pianos to be picked up. My proposal for *even* associating with lower copies of focus—presented in the previous section based on extensive independent evidence in section 3—is able to explain the behavior of *even* using the LF in (40), without invoking the scope theory of *even*. Nakanishi's argument from ACD for the scope theory of *even* has been successfully defused.

This copy-theoretic solution to Nakanishi's challenge makes a prediction which can be used to distinguish it from Nakanishi's scope-theoretic approach. Under my approach, focus association of *box* with *even* was possible in example (38) above because the focused constituent is the restrictor of the DP *the box* which was moved to avoid antecedent-containment, and therefore there is a lower copy of the F-marked *box* within the surface scope of *even* (40). However, following Fox 2002, the relative clause hosting the ACD ellipsis site is late-adjoined to the higher copy of the DP, outside of the antecedent VP for ellipsis and therefore outside of the surface scope of *even*. It follows that, under my copy-theoretic approach to such examples, *even* can associate with part of the restrictor of the QRed DP, as in (38) above, but not with focus in the relative clause itself. This prediction is schematized below in (43):

(43) **A prediction of the copy-theoretic account to Nakanishi's examples with *even* and ACD:**

a. Focus in the restrictor of the DP:

✓ ... [$_{VP1}$ ... *even* [$_{VP2}$ ... [$_{DP}$ ... XP_F ... [$_{RC}$ ... Δ (= VP1)

b. Focus in the ellipsis-hosting relative clause:

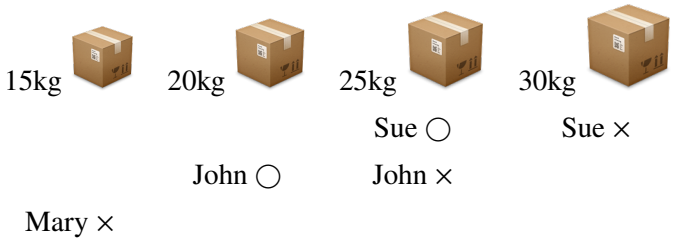
* ... [$_{VP1}$ ... *even* [$_{VP2}$ ... [$_{DP}$ ... [$_{RC}$ ... XP_F ... Δ (= VP1)

In contrast, Nakanishi's scope theory account would predict no difference in focus association between (43a) and (43b). In both cases, she proposes that *even* is interpreted above VP1 at LF, taking scope above the LF position of the DP and its relative clause.

I constructed the context in (44) below to test this prediction. The crucial test sentence is (44a), which differs from Nakanishi's example (38) minimally in the position of focus and the replacement of the pronoun *she* with *Mary*. The given context supports the intended scalar inference of *even* associating with focus on *Mary*, within the relative clause hosting the ACD ellipsis site.

(44) **The box-lifting competition:**

At the box-lifting competition, Sue first lifted the 25kg box and then failed to lift the 30kg box. John lifted the 20kg box but failed to lift the 25kg box. Mary was disqualified immediately, failing to lift the 15kg box.



And now it's Bill's turn. He normally does quite well, but somehow he did terribly. Today...

a. * he has failed to even lift [$_{DP}$ the box [$_{RC}$ that [Mary]$_F$ has △]]. (cf 38)

b. ✓ he has even failed to lift [$_{DP}$ the box [$_{RC}$ that [Mary]$_F$ has △]].

All speakers that I have consulted report a clear contrast between the two variants in (44), judging (44a) as ungrammatical and (44b) as grammatical. Notice that variant (44b) differs only in the surface position of *even*, above the verb *fail* instead of below it.

The contrast in (44) is predicted by my own proposal. Under my approach, *even* is interpreted in its surface scope. Under the copy-theoretic approach to ACD which I adopt, *the box* must QR to the edge of the higher *failed* VP and the relative clause is late-adjoined there. The intended focus *Mary* is in this relative clause. The complement of *even* in (44a) therefore does not contain *Mary*, and *even* is thus unable to associate with *Mary* here. In contrast, late-adjunction of the relative clause can take place right at the edge of the *failed* VP, within the surface scope of *even* in (44b). This allows the intended association in (44b).

Note furthermore that the contrast in (44) forms a strong argument against the scope theory. As discussed by Nakanishi (2012), the scope theory of *even* predicts *even* in (38) to be interpreted at LF outside of the scope of *fail*, which is a downward-entailing operator. Following Nakanishi, this derivation predicts that *even* will be in the same position at LF in (44a) as it is in (44b), from which position it should be able to associate with *Mary* in the relative clause in both cases. The robust contrast in (44) shows that *even* in (44a) does not move over downward-entailing operators.

I note that Nakanishi 2012 does in fact present examples of the form in (44), with focus in the relative clause and ACD predicted to force the relative clause outside of the surface scope of *even*, with the judgment that they are grammatical. Her three examples of this form are given in (45), with some additional underlining that will be discussed below. In each example, the sentence of interest is the last one.

(45) **Examples from Nakanishi 2012, predicted to be ungrammatical under my account:**

a. The king is ordering Al to visit every city that someone else is required to visit. Al is required to visit every city that his sister is Δ, and he is required to visit every city that his teacher is Δ. Moreover, Al$_i$ is required to even visit every city that [his$_i$ enemy]$_F$ is Δ. (Nakanishi: ex. 34)

b. Joe always tries to solve every problem that other people try to solve. He is trying to solve every problem that his classmate is trying to solve, and he is also trying to solve every problem

that his tutor is trying to solve. Moreover, he$_i$ is trying to even solve every problem that [his$_i$ supervisor]$_F$ is Δ. (*ibid*: ex. 36)

c. Ann hates her brother Bill, and so she always tries to do the opposite of what he does. For example, Ann almost always reads things that Bill refuses to read. However, there was one time when Ann was so tired that she didn't want to read anything, not even the things that Bill refused to read. So, at least once, Ann$_i$ has refused to even read everything that [her$_i$ brother]$_F$ has Δ. (*ibid*: ex. 40)

The examples in (45) do indeed seem to be grammatical with *even* associating with the intending focus associates. This runs counter to the prediction of my own copy-theoretic proposal (43) as well as the contrast observed in (44) above. What accounts for the grammaticality of these examples of Nakanishi's?

I suggest that the examples in (45) are in fact *not* examples of ACD. Instead, the ellipsis here is resolved cross-sententially, just as in the examples in (46):

(46) **Cross-sentential ellipsis:**

Our kids Sarah and Max love checking new books out of the library. We have a tradition where they will try reading the books they checked out first by themselves, and then reading them aloud to share with the family. Unfortunately this week, they both picked books which are too difficult for them. After they struggled for some time, we took over. In the end...

a. [I]$_F$ read the book that our [son]$_F$ was trying to read, and [my wife]$_F$ read the book that our [daughter]$_F$ was Δ.

b. [I]$_F$ read the book that [Sarah]$_F$ was trying to read, and [you]$_F$ read the book that [Max]$_F$ was Δ.

Δ = "trying to read"

These sentences in (46) are generally judged as grammatical. (I will discuss the difference between (46a) and (46b) below.) Here the intended ellipsis antecedent, *trying to read*, must be resolved cross-sententially using the underlined antecedents: there is no local instance of *trying to read* within the second halves in (46a,b). In the same way, I suggest that the ellipsis in the examples in (45) are actually resolved by the preceding underlined antecedents, rather than by moving the DPs *every city...*, *every problem...*, *everything...*, respectively, outside of the surface scope of *even*. Notice that my own test example constructed in (44) does not have this confound—i.e. there is no previous use of the VP *fail to read t* with a trace *t* as the complement of *read*—and we therefore can be sure that the ellipsis resolution in (44) is ACD.

In addition, in the examples of clear cross-sentential ellipsis in (46), some speakers express a slight preference for example (46a) using contrasting bound variables over the example with contrasting names in (46b). It is also known that the use of pronouns in place of proper names can sometimes improve marked

ellipsis constructions. This is illustrated by the contrast in (47) from Jacobson 2008, based on an earlier observation by Haïk (1987).

(47) **VP ellipsis with a bound variable, improved with a medial pronoun (Jacobson 2008: 52):**

a. John$_i$ voted for every girl$_j$ who$_j$ thought (that) he$_i$ would Δ.

b. * John voted for every girl$_j$ who$_j$ thought (that) Bill would Δ. Δ = "vote for her$_j$"

It is perhaps not an accident, then, that all of the examples of Nakanishi's in (45) which appear to counterexemplify my proposal include a bound variable immediately preceding the pseudo-ACD ellipsis site. See also Lasnik (2006) for a survey of other degraded or ungrammatical constructions which are mysteriously improved with the use of a bound pronoun subject. The exact source of this effect of bound pronouns is beyond the scope of the current paper.

When this potential confound is controlled so that cross-sentential, non-ACD ellipsis resolution is not possible, we can verify that Nakanishi's examples in (45) are indeed ungrammatical as predicted by my account. Example (48) below minimally tweaks the problem-solving sentence in (45b)—Nakanishi's example (36)—and adds a new context, in order to avoid this confound.

(48) **The math team (cf 45b):**

During the math competition's Team Event, the team must complete as many problems as possible during thirty minutes. In order to make sure all the problems are being worked on, the team writes each problem number on the board, and different team members mark the problems that they are currently trying to solve. Here is the board:

	Ali	Barbara	Carl	Daniel
1		x	x	x
2	x		x	
3				
4		x	x	x
5	x		x	x

Ali and Barbara have cautiously claimed just two problems each, while the star of the team, Daniel, has started to work on three. Carl has a tendency to try to solve many problems that others are also working on. Today...

a. * Carl is trying to *even* solve every problem that [Daniel]$_F$ is Δ.

b. ✓ Carl is *even* trying to solve every problem that [Daniel]$_F$ is Δ. Δ = "trying to solve"

The test sentence in (48a)—equivalent to (45b) above, except for the use of proper names, and not preceded by a cross-sentential antecedent of the form *trying to solve*—is judged as ungrammatical, whereas the same

structure with *even* above the higher VP headed by *trying* is judged as grammatical (48b). This contrast in (48) reproduces the pattern of contrast observed above with (44), predicted by my copy-theoretic approach to ACD in Nakanishi's examples. The ungrammaticality of example (48a), without the preceding context to support a cross-sentential, non-ACD parse, shows that the reported grammaticality of Nakanishi's examples in (45) cannot be used as reliable support for Nakanishi's scope theory analysis of *even*.

6 Conclusion

Nakanishi 2012 presented a unique argument for the scope theory of *even*, based on the interaction of focus association with *even* and antecedent-contained deletion (ACD). I have shown that one important premise in Nakanishi's argument—the assumption that *even* cannot associate with a focus which has moved out of its scope—is clearly false, thus defusing her argument. In the final section, I pointed out a further methodological issue with Nakanishi's examples: namely, the possibility of cross-sentential antecedents creating the illusion of ACD. Controlling for this confound, I showed that ACD examples in fact form a new argument against the scope theory of *even*. Nakanishi's scope theory of *even*—allowing *even* to take scope higher than its pronounced position at LF and associate with material from that position—would overgenerate many cases of focus association with *even*. English VP-*even* must instead always be interpreted in its pronounced position.

The discussion here provides novel empirical support for the idea that syntactic movement takes the form of copying (Chomsky 1993; a.o.). Copies in a copy chain may be modified for interpretation through Trace Conversion (Rullmann and Beck 1998; Sauerland 1998; Fox 2002; a.o.). Patterns of focus association with *even* are best accounted for by positing semantically contentful, rich trace positions. In particular, the interaction of *even* with ACD is correctly modeled by late-merger of relative clauses after copying (Fox 2002), and cannot be modeled under a variable-free account of ellipsis as in Jacobson 2008, nor by using non-movement assumption of variables and their later abstraction as in Dalrymple, Shieber, and Pereira 1991.

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