Natural Language & Linguistic Theory (2022) 41:793–845
https://doi.org/10.1007/s11049-022-09552-3

Argument ellipsis as external merge after transfer

Idan Landau[1]

Received: 23 May 2021 / Accepted: 3 September 2022 / Published online: 22 September 2022

Abstract
Argument Ellipsis (AE) is a productive process in Hebrew, but some arguments resist ellipsis—precisely those that do not denote individuals. This constraint, a reflection of a general constraint on variables in natural language, is captured if AE sites are descended from a *pro* element that is derivationally replaced by a constituent recoverable from the antecedent. This must occur after spellout (to escape pronunciation) but prior to LF (to allow overt subextraction). The proposed analysis integrates novel data as well as recent findings from studies of AE in East Asian languages, and offers a new derivational path to ellipsis, which invokes neither PF-deletion nor LF-copying.

Keywords Ellipsis · Variables · Transfer · Arguments · Semantic types

1 Introduction

It is now customary to classify analyses of ellipsis in natural language as falling under one of two approaches: PF-deletion or LF-copying (see Merchant 2019 for a recent survey). While the PF-deletion approach has come to dominate the literature on NP ellipsis, VP ellipsis, and TP ellipsis (sluicing), LF-copying has come to dominate the literature on Argument Ellipsis (henceforth, AE).[1] Focusing on Hebrew (with occasional forays into East Asian languages), the present study attempts to approach AE afresh, integrating the positive aspects of both approaches while not falling under either of them.

The motivation for a novel approach comes from what appears to be an insoluble empirical paradox: AE displays two conflicting sets of properties, one consistent with PF-deletion, the other consistent with LF-copying, but taken *together*—consistent

[1] Exceptions exist on both sides. For analyses of AE in terms of PF-deletion, see Cheng (2013); Maeda (2019); and Takahashi (2020).

✉ I. Landau
idanl@bgu.ac.il

[1] Department of Foreign Literatures & Linguistics, Ben Gurion University, Beer Sheva 84105, Israel

with neither. On the one hand, overt material can be extracted from AE sites, indicating that they are not purely LF-objects. On the other hand, the range of elidable arguments is severely constrained by a *semantic* property, which can only be stated over interpretable objects—*not* PF structures. The paradox seems to stem from a conflict between strongly representational views of ellipsis, and calls for a strongly derivational alternative, at least in the domain of AE.

The empirical novelty of the present study, which pushes in the direction of the derivational solution, consists in identifying the semantic property that is shared by all instances of AE: the elided category must be of type <e>. A range of arguments of higher types—predicates, predicate modifiers and generalized quantifiers—resist AE *even when fully recoverable* from the local linguistic context. I assimilate this phenomenon to a broader constraint on possible variables in natural language, one that has been contemplated before, in various forms (Chierchia 1984; Baker 2003; Landman 2006; Poole 2017).

To qualify as a variable, however, the AE site cannot be just an ordinary syntactic constituent, which happens to be silent. It must be a variable in the syntax. This points towards a version of the *pro*-replacement theory of ellipsis, where the syntactic gap is initially generated as a *pro*, which later gets replaced by a copy of the antecedent. How much later? Not too late (e.g., at LF), when it no longer possesses phonological features that can survive on material extracted from it. Yet not too early either, or it would undergo spellout, defeating ellipsis.

We are then led to propose that *pro*-replacement occurs at the phase level, immediately after the spellout operation (TRANSFER). While the merged argument goes unpronounced, material extracted from it to the phase edge will "escape silence" by being spelled out at the next phase level. Thus, we resolve the paradox presented above, a paradox of derivational opacity: a property observed on the surface (the constraint on the semantic type of the AE site) is explained by reference to a previous derivational stage (in which *pro* occurs) that is wiped out by subsequent operations. In spirit, then, this study aligns with recent advances in ellipsis studies that capitalize on derivational accounts (see the papers in Lipták and Güneş 2022).

The structure of this article is as follows. Section 2 presents the basic properties of AE in our test language, Hebrew, mainly drawing on my earlier work (Landau 2018). Section 3 examines two options of restricting AE by semantic type. One, due to Tomioka (2003) and Bošković (2018), restricts AE sites to properties, type <e,t>. The other, developed here, restricts them to individuals, type <e>. The latter view meshes better with the broader claim that variables *in general* are restricted to this type.

Section 4 is the empirical core of the article. It presents five different environments where AE fails because it applies to an argument whose denotation is not in the domain of individuals. Section 5 demonstrates that such arguments *can* be elided as part of genuine VP ellipsis, thus bolstering the case that AE cannot be reduced to V-stranding VP ellipsis.

Section 6 presents the analysis. First, it is argued that PF-deletion cannot capture the semantic type constraint on AE, and further fails to explain why deaccenting is not similarly restricted. Evidence for subextraction from AE sites is then presented, which furthermore displays morphosyntactic connectivity with the base position;

thus, LF-copying is also ruled out. The idea of External Merge after TRANSFER is then introduced, as a natural extension of Internal Merge after TRANSFER ("covert movement"), and illustrated in actual derivations. Section 7 discusses remaining issues and open questions. Contrary to earlier claims, it is shown that genuine quantificational arguments resist AE, as predicted. We then briefly consider the implications of the present analysis for the broader interest in mechanisms of ellipsis, and the challenge of accounting for the selective availability of AE across languages. Section 8 concludes the article.

2 AE in Hebrew

In general, internal arguments of verbs in Hebrew can go missing if their content can be recovered from context. Deictic and topical antecedents can provide the necessary content to some extent, although not as freely as this happens in discourse *pro*-drop languages ("radical *pro*-drop"). Below we focus on the properties of object gaps when they are identified by *linguistic* antecedents and how they differ from regular pronouns. Our discussion and data are extracted and simplified from Landau 2018.[2]

To begin with, AE sites support strict or sloppy readings, unlike pronominal objects.

(1) a. Gil nika et ha-šulxan šelo axarey še-Yosi nika ___.
Gil cleaned ACC the-table his after that-Yosi cleaned
'Gil cleaned his table after Yosi did.' (*strict or sloppy*)
b. Gil nika et ha-šulxan šelo axarey še-Yosi nika oto.
Gil cleaned ACC the-table his after that-Yosi cleaned it.ACC
'Gil cleaned his table after Yosi cleaned it.' (*only strict*)

An AE site accepts a disjunctive antecedent; in the same context, a pronoun only allows the E-type reading.

(2) A: cilamti knesiya o katedrala, ani lo batuax.
photographed.1SG church or cathedral I not sure
'I photographed a church or a cathedral, I'm not sure.'
B: gam ani cilamti ___.
also I photographed.1SG
'I also photographed a church or a cathedral.'
B′: gam ani cilamti ota.
also I photographed.1SG it
'I also photographed the one that you did.'

Unlike singular pronouns, the AE site can be construed with "quantificational" meaning (though see Sect. 7 for whether the term is appropriate here).

[2] In Landau (2018), my main concern was to vindicate the AE analysis over its competitors—*pro*-drop, Ā-variable and V-stranding VP ellipsis (VSVPE). Most of the data cited in this section is neutral between AE and VSVPE, as it is not my purpose to reproduce the earlier arguments against VSVPE here. Nonetheless, Sect. 5 returns to this debate with a new set of contrasts.

(3) a. afiti harbe ugiyot. Mixal gam afta ___ /#otan.
baked.1SG many cookies Mixal also baked.3SG.F them
'I baked many cookies. Mixal did too.'
b. ani makir kol student ba-kita ha-zot. Gam ata makir ___ /#oto.
I know every student in.the-class the-this also you know him
'I know every student in this class. You do too.'

AE sites allow nonspecific readings, in contrast to pronouns.

(4) A: lo niš'ar li kesef.
not remained to.me money
'I have no money left.'
B: li niš'ar ___/ *oto.
to.me remained *it
'I have some money left.'

As the name suggests, AE is not limited to DPs, and freely occurs with PP arguments as well.[3]

(5) A: šalaxti matana la-horim šeli.
sent.1SG gift to-parents my
'I sent a gift to my parents.'
B: ani šalaxti praxim ___.
I sent.1SG flowers
'I sent them flowers / I sent mine flowers.'

Finally, AE sites can occur inside islands. Furthermore, the antecedent argument and the AE site need not follow identical verbs. Both properties are illustrated in the example below.

(6) A: karata et ha-sefer šelo?
read.2SG.M ACC the-book his
'Did you read his book?'
B: lo na'im li ki afilu lo kaniti ___.
not pleasant to.me because even not buy.1SG
'I feel bad because I haven't even bought it.'

To sum up, AE is a robust phenomenon in the grammar of Hebrew, displaying all the characteristic properties that have been documented in the extensive literature on this phenomenon, which mostly comes from East Asian languages.[4] In particular, AE sites support a wide range of readings that cannot be subsumed under a simple *pro*-drop analysis. Nonetheless, and this point is critical for the discussion below, we will see that AE sites do pattern consistently with pronouns in a number of ways (Sect. 4). Hence, we will face an apparent paradox: although not *interpreted* as pronouns, AE

[3] In Sect. 6.2 I return to AE of clausal complements.

[4] See Park 1997; Oku 1998; Kim 1999; Takahashi 2006, 2008, 2013, 2014; Saito 2007, 2017; Aoun and Li 2008; Abe 2009; Cheng 2013; Simpson et al. 2013; Duguine 2014; Lee 2014; Sato 2014, 2015, 2016; Cyrino and Lopes 2016; Sato and Karimi 2016; Bailyn 2017; Rasekhi 2018; Sato 2019; Han et al. 2020; Sakamoto 2020; Soltan 2020.

sites and pronouns are subject to parallel distributional constraints. If the two are fundamentally distinct, why this parallelism? A resolution of this paradox will emerge from the analysis developed in Sect. 6.

3 Is AE regulated by semantic type?

AE has many consequences for syntax, so it is not surprising that most of the literature frames the fundamental question of the distribution of AE in syntactic terms. Yet the question of distribution is logically independent of the question of syntactic properties. It may well be the case that AE is subject to an overarching semantic distributional constraint, from which some of the syntactic properties follow. Indeed, if certain syntactic properties of AE cannot be plausibly traced to syntax or to PF, it makes sense to look for semantic explanations. This line of thought has been in minority in the AE literature because the empirical pressure to appeal to semantics (beyond the obvious conditions of recoverability and parallelism) has been rather negligible. In Sect. 4 I try to rectify this empirical picture, revamping the motivation for a semantic constraint. The present section lays down the foundations for a semantic-type-based perspective on the distribution of AE.

Section 3.1 discusses previous proposals taking this perspective: Tomioka (2003) and Bošković (2018). Both advance the idea that AE boils down to *predicate ellipsis*, that is, the AE site hosts a property-denoting constituent, type <e,t> (*pro* or a silent syntactic phrase). After laying it out, I discuss the theoretical and empirical shortcomings of this approach. Section 3.2 presents the framework for an alternative analysis: variables in natural language are individual-denoting, type <e>. Section 3.3 then implements this idea in the domain of AE and works out the empirical predictions that are put to test in Sect. 4.

3.1 Previous proposals: Elided arguments are of type <e,t>

Tomioka (2003) proposed that null arguments in Japanese (and by extension, in Korean and Chinese) are derived by property anaphora. An all-purpose *pro* of type <e,t> underlies the broad range of readings afforded by such null arguments: referential, bound variable, E-type, sloppy readings, indefinite and NP anaphora. Tomioka observed that the referential uses of *pro* can be derived using the same semantic tools that are independently required to derive <e>-type readings of NPs in Japanese, a language without determiners: existential closure and Iota type-shifting.[5] The appeal of this approach is in the explanation that it offers for the following generalization (Tomioka 2003: 336):

(7) *Discourse* pro-*drop generalization*
All languages which allow discourse *pro*-drop allow (robust) bare NP arguments.

[5]The proposal, of course, assumes that Japanese and similar radical *pro*-drop languages do not employ null determiners; thus, property-meanings can be converted to individual-meanings only post-syntactically.

Thus, bare NP languages make available the semantic operations that license property-denoting arguments in the syntax (see Chierchia 1998), and discourse *pro*-drop is just such an argument—that happens to be null. Tomioka (2003) recognizes that the correlation only goes one way: bare NPs occur in many languages which do not license discourse *pro*-drop. These languages, however, may utilize null determiners, and so would not harbor the semantic tools that generate the wide range of readings associated with AE.

The idea that AE and discourse *pro*-drop are non-arbitrarily linked has been taken up in later works. Saito (2007, 2017) maintains that AE is derived by copying an LF object antecedent and merging it in the LF structure of the elliptical clause. In addition, *pro* is available by default as an LF object for insertion. What LF objects and *pro* crucially share is absence of uninterpretable case features, hence both incur no violation of Full Interpretation at LF.[6] This is only possible, according to Saito, in agreement-less languages, where no uninterpretable features occur on v and T that would remain unchecked if arguments are syntactically missing.

Slightly revising this picture, Sakamoto (2020) proposes that AE is derived by substituting an LF object for a syntactic *pro* (rather than merging it directly with the verb), which essentially goes back to Lobeck's (1995) original analysis. If no replacement occurs, *pro* is discourse licensed. In contrast, agreement-licensed *pro*, as in Spanish, projects a branching structure, which is ineligible for LF-replacement. The analysis to be developed in Sect. 6 differs from Sakamoto's in *when* it takes *pro*-replacement to occur, but shares with it the fundamental point that the AE site starts out as a null pronominal—an assumption that will prove critical to understanding a whole new range of facts.

These ideas are integrated in Bošković (2018), which returns to Tomioka's original type-based restriction on AE and connects it to a general theory of the difference between "DP-languages" and "NP-languages." Strengthening Tomioka's proposal, Bošković restricts LF-copying to predicates only, namely to elements of type <e,t>. English-type languages, then, lack AE because its DP arguments are of type <e> (and a copied NP would never become an <e>-type entity, as the language lacks the type-shifting tools that are active in NP-languages). Following Cheng (2013), Bošković assumes that AE languages are a subset of NP-languages, that is, languages that lack a definite determiner, and thus project nominals as bare NPs. Finally, in order to account for the selective availability of AE even in NP languages, Bošković follows Saito (2007) and Şener and Takahashi (2010) in assuming that only arguments that are not associated with an agreeing functional head may be elided.

(8) *Main claims of Bošković (2018)* (see Bošković 2018: ex. 10, 14, 20)

a. LF-copying is limited to elements of type <e,t>.
b. AE is limited to NP-languages.
c. AE is blocked in agreement environments.

[6] In support of this analogy, Saito (2007, 2017) notes that AE and *pro* similarly extend to the same kind of PPs—locative and temporal PPs but not manner and reason PPs. However, if absence of syntactic checking of uninterpretable features were sufficient to license AE (= LF-copying), PPs and CPs—which do not check Case—would be eligible to ellipsis in English-type languages, contrary to fact (see Cheng 2013: 190).

The <e,t>-based analysis of Tomioka and Bošković has undeniable advantages, e.g., in shedding light on the crosslinguistic interaction of AE and clitic-doubling and in tying together a number of interpretive properties that are not easily accommodated under the alternative approaches (see in particular Tomioka 2014). Furthermore, Bošković (2018) is no doubt correct on one fundamental point of methodology: evidence for semantic type restrictions on the range of permissible AEs is, *ipso facto*, evidence for the LF-copying approach and against the PF-deletion one. For it is only at LF, and never at PF, that the semantic type of the constituent to be elided is visible. Although the analysis below draws quite the opposite conclusions regarding the range of permissible AEs, it does so by following the same logic that guided Bošković (2018).

Nevertheless, I will argue that (8a)–(8b) are false.[7] (8a) is a puzzling stipulation, unrelated to any independent grammatical principle. In fact, the alternative restriction that I propose below is nearly opposite—limiting LF-copying to elements of type <e> (see (21)). This restriction *does* fall under a much broader constraint that applies to all variables in natural language (see the next section).

On the empirical side, we will see in Sect. 4 that (8a) makes just the wrong predictions. Property-denoting arguments robustly resist AE. This is shown here systematically for Hebrew, but sample data from Japanese and Korean reveal the same pattern. The non-elidability of manifestly predicative arguments is extremely surprising if (8a) holds, but falls out naturally from the present alternative.

Turning the crosslinguistic picture, (8b) also looks dubious. While consistent with the extensive research on East Asian languages, as well as a few Slavic languages, it faces considerable obstacles elsewhere: Basque (Duguine 2014), Brazilian Portuguese (Cyrino and Lopes 2016; Panitz 2018), Hebrew (Landau 2018), Persian (Rasekhi 2018) and Egyptian Arabic (Soltan 2020) all use overt definite determiners, hence they are DP-languages in Bošković's sense; yet they clearly display AE with all its characteristic syntactic and semantic properties. Moreover, none of them qualifies as discourse *pro*-drop, which falsifies the alleged connection between that property and AE as well (Saito 2007, 2017; Sakamoto 2020). The full crosslinguistic terrain of AE, therefore, is considerably more varied than previously thought. While I have nothing to offer in regard to the important typological questions that arise from this state of affairs, I believe it is impossible to do justice to the current state of knowledge within the confines of (8b).

3.2 Towards an alternative: Variables in natural language are type-restricted

Ellipsis gaps are but one type of linguistic variable. Other types include pronominal anaphora and movement gaps. A broader perspective, then, may seek general constraints that cut across these different elements. Indeed, that variables in natural language are constrained, and interestingly so, in what they may range over, has been repeatedly observed in the literature. In this section I trace the history of this idea, which forms the kernel of the present analysis.

[7] (8c) is possibly false as well: Basque manifests AE of object despite the presence of object agreement (Duguine 2014). Since the status of the anti-agreement parameter of Saito (2007, 2017) is not at the focus of the present article, I will not discuss it any further.

Chierchia (1984) distinguishes between individuals and properties on the one hand, and higher types, on the other hand, which are associated with *functors* (determiners, prepositions, adverbs etc.) He proposed the *"No Functor Anaphora" Constraint* (Chierchia 1984: 83) which states that variables in natural language can range over individuals or properties only. Consequently, no anaphoric process may apply to functors.

Chierchia recognizes that the domain of individuals must include more than simple objects and animate beings. He mentions times and degrees, to which we can add places, reasons and other abstract entities (Chierchia 1984: 87).

(9) a. The time of his arrival is June 15.
b. John's height is amazing.
c. He pointed to (the place) where she hid.
d. The reason for this development is unexpected.
e. The possibility of failure paralyzed him.

Chierchia also notes that non-predicative adverbs like *almost*, *again* and *too* resist anaphoric processes—they can neither serve as antecedents to proforms like *thus* and *so* nor be answers to *how*-questions (I return to the former test below).

Baker (2003) advances a related constraint on anaphora in the context of his theory of lexical categories. Within this theory, nouns are privileged in possessing "a criterion of identity," which allows one to determine whether two Xs are the same thing (e.g., *That is the same man that you saw yesterday* vs. #*That is the same long as this*). It is this property—embodied in the noun's referential index—that allows nouns to enter anaphoric relations and excludes other categories from such, even when the intended meanings are perfectly sensible ((10a)–(10b) are from Kayne 1984: 139).

(10) a. Albania's destruction of itself grieved the expatriate community.
b. *The Albanian destruction of itself grieved the expatriate community.

In (11b), *it* can refer to the event of Chris's being sick but not to the property *sick* (Baker 2003: 129).

(11) a. Chris has a disease$_i$. It$_i$ also made Pat miss work.
b. Chris is sick. It also made Pat miss work.

In practice, Baker does allow non-nominal anaphora such as the event-referring *it* in (11b), and predicate (PredP) *pro*-forms such as the English *so* and French *il*. What he emphasizes is that bare APs or VPs, not embedded inside a PredP, can never antecede anaphoric pronouns (Baker 2003: 131); similarly, there are no reflexive AP- or VP-pronouns.

(12) a. ??John beat the iron flat and Mary beat the copper so.
b. *I caught a big fish and they caught a so bird.

The peculiar status of *such* and *so* is clarified in Landman's (2006) extensive work on variable in natural languages, to which I now turn.

Landman advances a more stringent version of Chierchia's "No Functor Anaphora" Constraint, which excludes even property-anaphora.

(13) *No Higher-Type Variables Constraint* (*NHTV*)
Variables in the LFs of natural languages are of type <e>.

The NHTV faces potential challenges in three areas: (i) *pro*-forms like *so* and *such* that appear to take property- or relation-denoting antecedents, and likewise anaphoric *one*; (ii) movement of predicates or adverbials, which appears to leave variables (traces) of higher types; and (iii) ellipsis of predicative categories.

Beginning with (i) and following observations by Carlson (1977), Landman (2006: 45, 48) points out that although *such* may appear to take modifier/property-antecedents in examples like (14a)–(14b), it cannot do so in examples like (14c)–(14d).

(14) a. *Old* ladies … *such* ladies …
b. Cats *without tails* … *such* cats …
c. People *in the next room* … ??*such* people (are obnoxious).
d. Men *that Jan fired this morning* … ??*such* men …

Carlson's insight was that *such* is restricted to taking *kind* antecedents. Because *people in the next room* does not invoke any specific kind, (14c) is unacceptable. Indeed, if the intended kind can be recovered from context, the examples improve dramatically (e.g., *I can't stand the people in the next room. Such people are obnoxious*, where the recovered kind is *loud people*).

Landman provides a decompositional analysis of *such* wherein it spells out the phrase *so like* (for syntactic evidence for the phrasal status of *such*, see Landman 2006: 39–45). *So* is a variable over kinds and *like* is a relation between kinds and individuals; applied to its complement NP, *such* = [*so like*] attributes the property of instantiating the kind anaphorically retrieved by *so*. In fact, an overtly phrasal counterpart of *such* with the same semantics is *like that*, which explicitly incorporates the anaphoric pronoun *that*. Crucially, under this analysis, the anaphoric element *so* (or *that*) is of type <e>, given that kinds are among the entities in the domain of individuals.[8]

What about anaphoric *one*? The classical analysis takes it to be an NP *pro*-form of type <e,t>. This would be challenge to the NHTV insofar as *one* itself is the denoting element. However, an alternative view capitalizes on the many properties that *one* shares with surface anaphors (Llombart-Huesca 2002; Harley 2007; Murphy 2018). On these analyses, an elided NP is the target of interpretation, while *one* is a PF-affix on Num^0 or little *n*, meaningless in itself (similarly to supportive *do*). Although we will shortly extend the purview of the NHTV to AE (see (21a) below), we definitely do *not* extend it to NP-ellipsis. The latter is, on the standard view, an instance of PF-deletion, which, by assumption, is not subject to the NHTV any more than VP-ellipsis or sluicing is. Certain overt pronominal forms, then, accompany sites of predicate

[8]Landman (2006: 98) only briefly discusses predicative *so* (e.g., *I thought she would be happy, but she certainly doesn't seem so*), suggesting a parallel treatment, in analogy to *that way*. An alternative analysis for all predicative *pro*-forms would be to assume that they denote "nominalized properties" in Chierchia's (1984, 1985) sense, that is, the individual correlates of properties.

ellipsis, rather than denote predicates themselves (see fn. 22 for further such cases); they are harmless to the NHTV.

Turning to case (ii)—movement of predicates/adverbials and predicative ellipsis—two solutions suggest themselves. First, at least locations and times can plausibly be taken to denote individuals (see (9)); thus *where*/*when*-questions pose no problem. VP-fronting and predicate movement, in turn, display obligatory reconstruction (Heycock 1995; Takano 1995). This means that at LF there is no operator-variable structure because the higher-type element is interpreted in its base position. Indeed, as Poole (2017) convincingly argues, the type-restriction on possible traces is the most straightforward explanation for the generalization that displaced predicates obligatorily reconstruct (see below).

Poole revisits a curious correlation that Postal (1994) discovered. Postal identified a series of Ā-extractions in English—which he termed *B-extractions*—that are impossible to launch from certain syntactic environments. One such environment is the name argument of a naming verb (like *name, call, nickname, baptize*), which may undergo *wh*-movement (Postal's *A-extraction*) but not topicalization, specifically of the contrastive type (Postal's *B-extraction*). The following pair is from Postal (1994: 164).

(15) a. What$_i$ did they name him t$_i$?
b. *Raphael$_i$, I wouldn't call anybody t$_i$.

Restrictive and nonrestrictive relativization exhibits a parallel contrast (Poole 2017: 25).

(16) a. Helen disliked the nickname$_i$ that Irene always called the cat t$_i$.
b. *Helen disliked that nickname$_i$, which Irene always called the cat t$_i$.

Postal argued that B-extractions (like contrastive topicalization and nonrestrictive relativization), in fact, involve a silent resumptive pronoun which itself undergoes movement (to its antecedent). Because certain positions resist pronouns—Postal called them *antipronominal environments*—they cannot launch B-extractions. The position of the name argument of a naming verb is one such environment, as can be independently verified (Postal 1994: 169).

(17) * He named his daughter Lucille$_i$ but I didn't name mine it$_i$.

Poole (2017: 26), however, points out that name arguments are also blocked from undergoing QR; compare the available inverse scope in (18a), where the individual-denoting object undergoes QR over the subject, with the unavailable inverse scope in (18b), where the name argument cannot.

(18) a. A (different) child called every cat Garfield.
b. A (# different) child called the cat every nickname.

The antipronominal property of name-argument gaps cannot explain (18b), which should naturally fall together with (15b) and (16b). What ties these cases together, according to Poole, is that they all require movement to leave a variable (trace) in a position which is s-selected as a property. Enter the NHTV (or some version of it):

because variables are restricted to the semantic type of individuals, the resulting LFs are uninterpretable.[9] On this view, the antipronominal property is a correlation rather than a cause; weak pronouns denote individuals and so cannot substitute property-denoting arguments, as in (17).[10]

That the name argument of naming verbs denotes a property is extensively defended in Matushansky (2008). Matushansky observes that in many languages, that argument bears the hallmarks of a predicate: languages that introduce standard names with the definite article (like German) do not use it for the name argument of naming verbs; other languages mark it with the designated particle or case that is used with predicates (Welsh, Korean, Russian, Finnish), as partly seen even in English examples like *Let's label/define/designate this node* ***as*** *VP*. And languages with case agreement on predicates (Latin, Greek, Icelandic) apply that process to the name argument of naming verbs as well.

Semantically, on Matushansky's analysis, this name argument denotes a set of individuals that bear that name according to some naming convention (as provided by the verb—nicknaming, baptising, etc.). The naming convention, in turn, is a relation between individuals and phonological strings ("names"), the latter of type <n>. The name argument is therefore a predicate of type <e,<n,t>>. I gloss over further details since they are not relevant to the main point, which is, to repeat: the name argument of naming verbs does not denote an individual.

Following Postal (1994), Poole discusses three other antipronominal environments: the associate of *there*-constructions, the color-naming adjective in change-of-color verbs, and predicate nominals. All display the same correlation between resistance to weak definite pronouns and failure of B-extractions. I only illustrate the third one below (Poole 2017: 27–28, 31).

(19) a. *Erica wanted to become a teacher$_i$ and she became it$_i$.
b. *A math teacher Erica became t_i / made out of Alex t_i.

In Sects. 4.4–4.5, I show that naming verbs and predicate nominals are also two environments where AE fails.

We now come to the third and final potential challenge to the NHTV: predicate ellipsis (subsuming VP-ellipsis). Does this process produce higher-type variables at LF?

[9] I am oversimplifying Poole's account. Poole proposes that *traces* must range over individuals (the *Trace Interpretation Constraint, TIC*) and argues (Poole 2017: 228) that this constraint cannot be subsumed under the NHTV because traces are converted to anaphoric definite descriptions that *contain* a variable (Fox 2003; Sauerland 2004). The TIC has the effect of ruling out both property-type traces and generalized-quantifier (GQ) type ones. GQ-traces (of type <<e,t>,t>) would allow semantic reconstruction (for scope) to dissociate from syntactic reconstruction (for binding); but previous work has established that the two go together (Romero 1998; Fox 1999). Nevertheless, Poole acknowledges that the NHTV and TIC should be unified at some deeper level. From the perspective of the present discussion, AE sites start out their derivational live hosting a *pro*-variable (Sect. 6), so it makes sense to keep to Landman's framework and the NHTV.

[10] Demonstrative pronouns are acceptable in antipronominal environments (e.g., *Irene liked the name Snowflake, and she called the cat that/*it*; Poole 2017: 31). Drawing on various syntactic and semantic considerations, Poole (2017: 217) argues that they are type-shifted to denote a property. Alternatively, demonstrative pronouns are phrasal modifiers (see Leu 2007 and the references therein), already interpreted as predicates. When used referentially (e.g., *I saw that*), they modify a null noun denoting THING.

In fact, as Landman (2006: 136) observes, if predicate ellipsis is derived by PF-deletion, it poses no challenge to the NHTV. On this analysis, ellipsis sites contain a fully interpreted syntactic structure at LF. The predicate gap is not a variable, hence vacuously satisfies the constraint on variable types. Interestingly, Landman (2006: 138, fn. 73) notes that if ellipsis is to be analyzed as LF-copying of the antecedent predicate into "an empty node," nothing much changes, since the ellipsis site again would not be occupied by a variable at LF.

But what is this empty node? Radically empty nodes are not a theoretical possibility in current minimalist syntax. The LF-copying analysis, in fact, originally assumed that the ellipsis gap hosts an empty pronominal, *pro*, which gets replaced at LF (Lobeck 1995). Clearly, *pro* is a variable. Whether its semantic type is visible to the NHTV is actually not so clear, given that it does not survive to the semantic interface, having been replaced by a syntactic constituent by then. I return to this point in Sect. 6.3, where the mechanism of AE and its relation to argumental *pro* is laid out.

3.3 The present proposal: Elided arguments are of type <e>

We have seen that, to the extent that previous literature addressed the question of semantic type restrictions on ellipsis, two views have emerged.

(20) a. *The property-restriction view*
Ellipsis is LF-copying → restricted to type <e,t>
(Tomioka 2003; Bošković 2018)

b. *The no-restriction view*
Ellipsis is PF deletion → no semantic type restriction
(Landman 2006)

At the same time, a wide range of evidence suggests that something like the NHTV is correct—variables in natural language, often realized as *syntactic gaps*, are restricted to type <e>. This evidence does not comfortably harmonize with either (20a) or (20b). These two views simply do not lead us to expect that ellipsis sites should be restricted to type <e>. Yet in Sect. 4 I will show that the empirical profile of AE, at least in Hebrew and potentially in other languages too, is best described in such terms. This evidence, then, will motivate a new account of ellipsis, to be spelled out in Sect. 6.

To deal with the distribution of AE, I propose the following conditions.

(21) *Consequences of the NHTV*
a. Elided arguments are restricted to type <e>.
b. Weak definite pronouns are restricted to type <e>.
c. Therefore: there is a tight correlation between environments that resist AE and environments that resist weak definite pronouns ("antipronominal").

Notice that (21c) emphatically states a correlation, not a cause. As shown in Sect. 2 and in ample previous work, AE sites are *not* pronominal in their interpretation, allowing a range of readings unavailable to pronouns (overt or not): mass, nonspecific, quantificational, disjunctive and sloppy readings. Saying that there is a systematic set of environments from which both AE and pronouns are excluded does not imply that

they are the same thing (e.g., both tense and agreement are excluded from infinitives without being the same thing). Rather, it implies that both phenomena are governed by a common constraint—in this case, the NHTV. Now, it remains to be explained *why* AE is subject to the NHTV if it does not host a pronoun. In Sect. 6 I argue that while the AE site does not host a pronoun *at LF* (the input to semantic interpretation), it does host one, namely *pro*, throughout part of the derivation. This analysis holds the key to the correlation stated in (21).

4 Impossible AE

In this section I discuss five different environments in which AE is blocked in Hebrew. These are all *argumental* environments; some predicate, normally a verb, selects a particular argument, but this argument cannot undergo ellipsis under identity with a locally available antecedent. Since recoverability is not at stake, something else must be responsible for the failure of AE; I argue that it is condition (21a). In some cases, the elided argument obviously does not denote an individual; in other cases this is not obvious, so independent evidence will be presented to that effect.

The five environments are these: (i) chunks of non-decomposable idioms; (ii) argumental adverbs; (iii) argumental measure phrases; (iv) names in naming verbs, and (v) predicate nominals. Case (ii) involves a non-nominal argument without a suitable weak proform. All the other four cases, however, take nominal arguments that nonetheless cannot be pronominalized, confirming condition (21b) as well.

4.1 Chunks of non-decomposable idioms

The distinction between decomposable and non-decomposable idioms was first made by Nunberg et al. (1994), who distinguished between "idiomatic phrases" (non-decomposable) and "idiomatically combining phrases" (decomposable). A rich syntactic and psycholinguistic literature has since uncovered its numerous consequences. For a recent overview with specific evidence from Hebrew, see Fadlon et al. 2018. While there are no absolutely sharp criteria to tell apart the two types—because many idioms seem to be more or less decomposable—the basic intuition is fairly clear.

To take a simple example, compare the English idioms *pull strings* (decomposable) and *kick the bucket* (non-decomposable). A decomposable idiom lends itself to isomorphic paraphrases, where each piece of the idiom is mapped to a corresponding piece in the paraphrase. Thus, *pull strings* is readily mapped to *exercise influence*; the idiomatic verb *pull* receives a metaphorical sense as *exercise*, and likewise for *strings* and *influence*. In contrast, the natural paraphrase of *kick the bucket*, namely *die*, does not provide clear counterparts to either *kick* or *the bucket*. Indeed, often transitive non-decomposable idioms are naturally paraphrased as intransitive predicates, while the paraphrases of decomposable ones preserve the idiom's transitivity.

In the present context, the relevant aspect of the distinction is this: chunks of decomposable idioms are denotational—even if this denotation is mediated by some metaphoric inference—whereas chunks of non-decomposable idioms are not. One way of failing to denote an individual, that is, failing condition (21a), is failing to denote at all. We therefore expect the latter type of idiom chunks to resist AE and the former type to allow it. This is indeed what we find.

Examples (22)–(27) involve different kinds of non-decomposable idioms; in all of them, the boldfaced idiom chunk cannot serve as antecedent for AE in the second sentence.

(22) Idiom: *ra'a koxavim* (literally: 'see stars'), 'feel dizzy'

A: xatafti kazot maka še-ra'iti **koxavim**.
got.1SG such blow that-saw.1SG stars
'I got hit so hard that I felt dizzy.'

B: *ani rak nisrateti, az lo raiti ___.
I only got-bruised.1SG so not saw.1SG
('I only got bruised so I didn't feel dizzy.')

(23) Idiom: *dafak xešbon* (literally: 'knock account'), 'care about people's opinions'

A: ma ixpat li ma hem omrim, ani lo dofeket **xešbon**.
what care to.me what they say.PL I not knock.F.SG account
'What do I care about what they say, I don't give a damn.'

B: *OK, aval ani ken dofeket ___.
OK but I yes knock.F.SG
('OK, but I do.')

(24) Idiom: *hoci et ha-mic* (literally: 'extract the juice'), 'put (someone) through hell'

A: ha-bank hoci li **et** **ha-mic** ad
the-bank extracted.3M.SG to.me ACC the-juice until
še-išer li halva'a.
that-approved.3M.SG to.me loan
'The bank put me through hell until they approved my loan.'

B: *ken, gam ha-bank šeli hoci (li) ___ / oto
yes also the-bank my extracted.3M.SG (to.me) / it.ACC
('Yeah, my bank did too.')

(25) Idiom: *tafas taxat* (literally: 'grab ass'), 'act arrogantly'

A: ma ata tofes **taxat** (aleynu)?
what you grab.M.SG ass on-us
'Why do you behave so arrogantly (to us)?'

B: *ani? ani lo tofes ___.
I not grab.M.SG
('Me? I don't.')

(26) Idiom: *hixnis la-kis ha-katan* (literally: 'put to the small pocket'), 'be way better'

A: Maradona maxnis et Messi **la-kis** **ha-katan**.
Maradona put.inside.M.SG ACC Messi to.the-pocket the-small
'Maradona is way better than Messi.'

B: *hu gam maxnis et Ronaldo ___.
he also put.inside.M.SG ACC Ronaldo
('He's also way better than Ronald.')

(27) Idiom: *he'ela xeres be-yado* (literally: 'draw up clay in his hand'), 'fail, do something to no avail'

A: hu xipes axar bito šanim, aval he'ela **xeres be-yado**.
he searched after daughter.his years but drew.up clay in-hand.his
'He searched for his daughter for years to no avail.'

B: *kol mi še-xipes ota he'ela ___ ___.
every who that-searched her drew.up
('Everybody who searched for her failed.')

Now compare decomposable idioms. Chunks of such idioms are denotational. For examples, *gšarim* 'bridges' in (30) is readily construed as "potentially useful connections." For this reason, such idiom chunks are much more hospitable to AE.[11]

(28) Idiom: *hipil tik*(*im*) (literally: 'drop file(s)'), 'assign unpleasant duties'

lama kol ha-zman mapilim alay tikim ve-alexa lo
why all the-time drop.M.PL on-me files and-on.you not
mapilim ___?
drop.M.PL
'Why do they always assign unpleasant duties to me and not to you?'

(29) Idiom: *sagar et ha-berez* (literally: 'close the tap'), 'cut off the budget'

A: sagru lanu et **ha-berez** lifney šana.
closed.3PL to.us ACC the-tap before year
'They cut off our budget a year ago.'

B: lanu sagru ___ / oto lifney šnatayim.
to.us closed.3PL it.ACC before two.years
'They cut off ours two years ago.'

(30) Idiom: *saraf gšarim* (literally: 'burn bridges'), 'eradicate all connections'

A: lo hayiti maci'a lexa lisrof **gšarim** ba-mosad
not was.1SG advise.M.SG to.you to.burn bridges in.the-institution
ha-ze.
the-this
'I wouldn't advise you to burn your bridges in this institution.'

B: ani lo soref ___, aval ein li kavana laxzor.
I not burn.M.SG but not.exist to.me intention to.return
'I don't, but I have no intention to return.'

(31) Idiom: *hidlik nura aduma* (literally: 'light up a red light bulb'), 'raise one's suspicion'

A: ha-hitnahagut ha-muzara šelo hidlika li **nura aduma**.
the-behavior the-strange his lit.up.3F.SG to.me light.bulb red
'His strange behavior raised my suspicion.'

[11] There is some inter-speaker variation in the extent to which individual examples are judged acceptable, yet the set in (28)–(31) is overall clearly distinguishable from the set in (22)–(27), which is ungrammatical for all speakers. The attested variation in AE within decomposable idioms possibly reflects the fact that "decomposability" is a gradient scale, and different speakers may draw the line at different points along that scale.

B: le-kulanu hi hidlika ___.
to-all.of.us she lit.up.3F.SG
'It did so for all of us.'

Notice that pronominal anaphora to the antecedent idiom chunk is possible in (29) but not in (24), confirming (21b). This test cannot easily be applied to the other cases, in which the idiom chunk is either nonspecific or a dative locative PP.[12] Yet the pronominalization asymmetry is clearly evident with definite idiom chunks, as shown below.

(32) Non-decomposable idiom: *hoci min ha-kelim* (literally: 'take out from the dishes'), 'drive (someone) mad'

*Gil hoci oti min ha-kelim, ve-az higia
Gil took.out.3M.SG me.ACC from the-dishes and-then arrived.3M.SG
axiv ve-himšix le'hoci oti **mehem**.
brother.his and-continued.3M.SG to. took.out me.ACC from.them
('Gil drove me mad, but then his brothert arrived and continued doing so.')

(33) Decomposable idiom: *zara melax al ha-pca'im* (literally: 'sprinkle salt on the wounds'), 'make someone's agony even greater'

Gil zara li melax al ha-pca'im, ve-az
Gil sprinkled.3M.SG to.me salt on.the-wounds and-then
higia axiv ve-himšix lizrot **aleyhem**
arrived.3M.SG brother.his and-continued.3M.SG to.sprinkle on.them
melax.
salt
'Gil rubbed salt into the wound (on me), and then his brother arrived and continued doing so.'

A striking minimal pair is given in (34). Note that the verb *šavar* 'break' is construed as a causative verb in the decomposable idiom ('break someone's heart') but as an incohative verb in the non-decomposable idiom ('break one's own head'), leaving the object in the latter case with no separable semantic denotation.

(34) a. *Decomposable*
šavar (le-mišehu) et ha-lev
broke (to-someone) ACC the-heart
'break someone's heart'
Causative paraphrase: 'cause someone's feelings to turn into great sorrow'
Metaphorical meaning of the idiom chunk *lev* 'heart': feelings

[12] Dative pronouns in Hebrew are necessarily human-denoting (Francez 2006), ruling out pronominalization of the idiom chunk in (26).

b. *Non-decomposable*
šavar et ha-roš
broke ACC the-head
'think very hard'
Inchoative paraphrase: 'think so hard that your head breaks'
Metaphorical meaning of the idiom chunk *roš* 'head': ?

We therefore expect *lev* 'heart' in the first idiom to license AE and pronominal anaphora, but *roš* 'head' in the second idiom to exclude both. This is indeed the case.

(35) a. Rina šavra le-Gil$_j$ et ha-lev$_i$ lifney šana, ve-axšav Maya
Rina broke.3F.SG to-Gil ACC the-heart before year and-now Maya
šavra lo$_j$ ___ / oto$_i$.
broke.3F.SG to.him it
'Rina broke Gil's heart a year ago and now Maya did.'

b. *Rina šavra et ha-roš al ha-targil ha-axaron, ve-axšav
Rina broke.3F.SG ACC the-heart over the-exercise the-last and-now
Maya šavra ___ / oto.
Maya broke.3F.SG it
('Rina thought very hard about the last exercise and now Maya did.')

An anonymous reviewer suggests the following alternative account of the facts in (22)–(27), in terms of the competing analysis of V-stranding VP-ellipsis (VSVPE): non-decomposable idioms do not have genuine internal structure, or maybe they do, but that structure is fixed and cannot be altered in the syntax. Thus, V-raising is impossible out of them and, perforce, VSVPE is also excluded.

This alternative, however, is untenable. First, even advocates of VSVPE acknowledge the need for an independent null object strategy in Hebrew (Doron 1990, 1999; Goldberg 2005). The question therefore remains why the object gaps in the B examples of (22)–(27) cannot be filled by such null objects—a strategy crucially *not* dependent on V-raising. Second, verbal heads of non-decomposable idioms are no less syntactically active than any other verb for the purposes of agreement and inflection; resistance to movement alone would seem like an unmotivated aberration. Third, and most importantly, one can show that the facts remain unchanged even in contexts where V-raising is independently ruled out. In Landau (2018) I examined object gaps in Hebrew sentences containing the lowest adverbs in Cinque's hierarchy, like *le'itim krovot* 'frequently.' If an object gap occurs next to a verb that is placed to the *right* of such an adverb, we can be confident that no V-raising had taken place (otherwise, the verb would have preceded the adverb). Hence, the object gap must result from AE and not VSVPE.

The sentences with an attempted deletion of a chunk of a non-decomposable idiom can be easily modified to include such adverbs; they all remain ungrammatical, as shown in the following representative example.

(36) A: Yosi tofes **taxat** aleyxa?
Yosi grab.PRS.M.SG ass on.you.M.SG
'Does Yosi behave arrogantly to you?'

B: *hu le'itim krovot tofes ___.
he frequently grab.PRS.M.SG
('He frequently does.')

It would of course be desirable to corroborate the claim that chunks of non-decomposable idioms are resistant to AE with further crosslinguistic evidence, bearing in mind the obvious fact that the set of such idioms is not given in advance and that its precise boundaries somewhat vary across speakers (see fn. 11). Not much relevant evidence is available; below I briefly review facts from Swahili, Greek, Japanese and Brazilian Portuguese. The facts are mostly consistent with the present analysis but require further research.

Ngonyani (1996) cites the following example in Swahili, where the object of the idiom 'hit telephone' is missing from the second conjunct.

(37) dada a-li-pig-a **simu** na mama a-li-pig-a ___ pia.
sister 1SA-PST-hit-FV telephone and mother 1SA-PST-hit-FV also
'Sister called and mother did too.'

The example, however, is not conclusive, since 'hit telephone' can be plausibly assigned the decomposable meaning 'make call,' in which the idiom chunk simply means 'call.' Thus, AE is not excluded.

In Greek too, idiom chunks can undergo ellipsis (Merchant 2018: 246).

(38) a. I Elines politiki tazun **lagus me petraxilia**, ala i
the Greek politicians vow rabbits with priests' habits but the
Amerikani politiki pote dhen tazun ___.
American politicians never not vow
'Greek politicians promise the moon, but American politicians never do.'

b. To pedhi tha fai **ksilo**, ala o Kostas dhen tha (#to) fai ___.
the kid fut eats wood but the Kostas not fut it eats
'The kid will get hit, but Kostas won't.'

Like Ngonyani, Merchant advocates the V-stranding VP-ellipsis analysis for such examples; I take them to be derived by AE, assuming that V-stranding VP-ellipsis is not a viable analysis (Landau 2020a,b). In fact, it seems likely that the idiom in (38a) is decomposable, with the boldfaced chunk meaning something like 'unattainable goals.' Other idioms allowing AE in Merchant (2018) are amenable to a similar analysis. (38b) is more challenging in that it is difficult to assign it a decomposable meaning. Merchant (2018: fn. 6) does note that not all speakers allow the idiomatic reading under ellipsis. Pending further research, (38b) remains an open problem.

In Japanese, chunks of non-decomposable idioms cannot be scrambled, pronominalized or elided (Sato 2020). Scrambling and pronominalization are possible when the chunk belongs to a decomposable idiom. The status of AE is not entirely clear, though. Sato provides the following single example of a decomposable idiom, noting that six out of eight speakers rejected AE of the idiom chunk and two accepted it.

(39) Sato-kun-wa ukkari koosyooaite-ni **tenouti-o**
Sato-TIT-TOP inadvertently negotiating.partner-to palm.of.hand-ACC
misetesimatta. Suzuki-kun-wa raibarutasya-ni {*e*/sore-o}
showed Suzuki-TIT-TOP competitor.company-to it-ACC
misetesimatta
showed
'Mr. Sato inadvertently showed his secret plan to his negotiating partner. Mr. Suzuki showed his secret plan to his competitor company.'

Although marked as ungrammatical by Sato, the AE option, as noted, was accepted by two out of eight speakers. In contrast, and consistent with the present proposal, Takahashi (2006: 16, 32) notes that the chunk *keri* 'end' in the following decomposable idiom may undergo AE (though not pronominalization).

(40) Taroo-ga sono mondai-ni keri-o tuketa-ra, Hanako-wa kono
Taroo-NOM that issue-to end-ACC attached-when Hanako-TOP this
mondai-ni {*e*/* sore-o} tuketa.
issue-to it-ACC attached
'When Taroo finalized that issue, Hanako finalized this issue.'

Given the paucity of evidence, it seems premature to declare that AE in Japanese fails with chunks of decomposable idioms.[13]

Finally, chunks of non-decomposable idioms seem to resist AE in Brazilian Portuguese as well (Ezekiel Panitz, p.c.), a language shown to possess AE (Cyrino and Lopes 2016; Panitz 2018; Cyrino 2021).

(41) O João abotoou o paletó. O Pedro também abotoou ___.
the João buttoned the jacket. The Pedro also buttoned
'João died. #Pedro also buttoned.' (only literal meaning)

Note that the second conjunct should be derivable on a V-stranding VP-ellipsis analysis, corroborating Landau's (2020a) conclusion that Portuguese lacks this option (see Sect. 5 for discussion).

4.2 Argumental adverbs

As is well-known, AE is a productive process in Korean (Park 1997; Kim 1999; Saito and An 2010; Lee 2014; Han et al. 2020; Sakamoto 2020). Lee (2016: 16) observed, however, that argumental adverbs resist AE:

[13] As to the difference between ellipsis and pronominalization of the idiom chunk, Sato claims it follows from the LF-copying analysis of AE: "The body part in the antecedent clause… cannot serve as a suitable target for LF-copy because it has already become an unanalyzable part of the whole atomic VP by the time when the elided part in the elliptical clause is to be filled by LF-copy" (Sato 2020: 272), but "a pronoun (overt or null) can be employed even when its antecedent is a part of a syntactically derived complex predicate at LF" (Sato 2020: 273). This seems like a description of a puzzle rather than a solution. What allows discourse anaphora to access an "unanalyzable part of the whole atomic VP"? Note that truly unanalyzable units create anaphoric islands (Postal 1969; Ward et al. 1991). On the present approach, no systematic discrepancy is expected between the accessibility of idiom chunks to pronouns and to silent constituents that replace pronouns.

(42) A: ku-nun yeuypalukey hayngtonghay-ss-ni?
he-TOP courteously behave-PST-Q
'Did he behave courteously?'
B: *ani, hayngtonghaci anh-ass-e.
no behave NEG-PST-DECL
('No, he didn't.')

Argumental adverbs are a curious hybrid: their obligatory presence classifies them as selected arguments, while their semantic contribution classifies them as adverbs. Standard adverbs may or may not be elided in VP ellipsis (Sag 1976); when the grammar allows both options (as in (43a)), the choice is informed by parsimony and other pragmatic considerations (Moulton 2019).

(43) a. John talked to us gently and Mary did too.
b. John talked to us gently and Mary did rudely.

Argumental adverbs, however, cannot escape VP ellipsis.

(44) a. The first waiter treated us gently and the second one did too.
b. *The first waiter treated us gently and the second one did rudely.

(45) a. John behaved well and Mary did too.
b. *John behaved well and Mary did badly.

(44a) and (45a) indicate that nothing prohibits deletion of argumental adverbs per se, as long as they are part of a larger ellipsis. The problem in (42B), then, is that the argumental adverb is targeted for ellipsis *by itself*; this seems to be impossible (also implying that the construction cannot involve VPE, disguised by V-stranding; see Sect. 5).

Hebrew manifests exactly the same ban on ellipsis of argumental adverbs. In the context of the verbs *hitnaheg* 'behave,' *nahag* 'treat' and *hitnahel* 'manage oneself,' manner adverbs are obligatory. In sharp contrast to entity-denoting arguments, however, these argumental adverbs resist ellipsis.

(46) a. *Yosi hitnaheg yafe aval axiv lo hitnaheg ___.
Yosi behaved.3M.SG well but brother.his not behaved.3M.SG
('Yosi behaved well but his brother didn't.')
b. A: tinhag ba-yeled šeli be-adinut.
treat.FUT.2M.SG in.the-child my in-gentleness
'Treat my child gently.'
B: *al tid'ag, ani enhag (bo) ___.
not worry.FUT.2M.SG I treat.FUT.1SG (in.him)
('Don't worry, I will.')
c. *Trump hitnahel (be-nivzut/kmo biryon), aval
Trump managed.himself.3M.SG in-nastiness/like bully but
Biden lo yitnahel ___.
Biden not manage.himself.FUT.3MSG
('Trump managed himself nastily/as a bully, but Biden won't.')

Note that these facts are different and independent of the adjunct-exclusion facts discussed in Landau (2018, 2020a). The latter facts reveal that standard VP-adjuncts cannot be captured under AE because they lie outside its syntactic scope; the result is grammatical nonetheless. The present facts reveal that argumental adjuncts cannot be captured under AE even though they *are* within its syntactic scope; the result is ungrammatical, and calls for an additional constraint, of the kind proposed in (21a). Since there are no adverbial pro-forms, (21b) cannot be tested for this class of cases.[14]

Another environment where manner adverbs are obligatory is in middle constructions. Once again, ellipsis of these obligatory adverbs is impossible.[15]

(47) a. A: ha-žaket šeli mitnake be-koši rav.
the-jacket my cleans.3M.SG in-difficulty much
'My jacket cleans with much difficulty.'
B: šeli gam mitnake *(be-koši rav).
mine also cleans.3M.SG in-difficulty much
'Mine does too.'

b. širim arukim nixtavim be-kalut;
poems long write.M.PL in-ease
širim kcarim davka lo nixtavim *(be-kalut).
poems short rather not write.M.PL in-ease
'Long poems write easily; short poems, in fact, don't.'

Whether obligatory adverbs in middles should count as "argumental" is not clear; yet the fact that they resist AE similarly to argumental adverbs suggests a common explanation. Indeed, if all these adverbs are predicate modifiers, their semantic type is <<e,t>,<e,t>>. Condition (21a) correctly predicts that they will all fail to undergo AE.[16]

4.3 Argumental measure phrases

Measure phrases like *20 pounds* or *six hours* quantitatively specify the extent to which an event measures along some scale. While they are often found as optional adjuncts, certain verbs require such measure phrases as obligatory arguments (e.g., *This car costs* *($6,000)). It is these argumental measure phrases that are of interest here, for they sharply contrast with entity-denoting arguments in their resistance to AE. The sample below demonstrates that the nature of the scale—weight, duration, price or

[14]For arguments that English *so*/*thus* are not pro-adverbs, but rather denote properties of realizations of *event kinds*, see Landman (2006: 83–92).

[15]Hebrew middle morphology is sometimes syncretic with passive morphology, as in (47b). The second clause in the latter thus has an irrelevant (and absurd) passive reading without the adverb – short poems are not written.

[16]An additional case in point involves frequency and duration adverbs in Chinese, which, according to the prevalent view, occupy a complement position in the VP (Huang 1982; Li 1990; Soh 1998). When co-occurring with an object, they trigger verb doubling. AE may then target the object but not the adverb, which is, in fact, obligatory (Li 2014: 55).

(i) ta nian shu nian san ci/tian le; wo ye nian le *(san ci/tian).
he read book read three time/day LE I also read LE (three time/day)
'He read books three times/days; I also read.'

area—does not matter; the argumental measure phrase is consistently non-elidable.

(48) a. A: ani šokel 70 kilo.
I weigh.M.SG 70 kilo
'I weigh 70 kilos.'
B: ha, ani kvar mi-zman lo šokel *(70 kilo)!
huh I already from-time not weigh.M.SG 70 kilo
'Huh, I haven't weighed 70 kilos for a long time!'

b. ha-ma'araxa ha-rišoona nimšexa xaci ša'a, ve-ha-ma'araxa
the-act the-first lasted.3F.SG half hour and-the-act
ha-šniya gam nimšexa *(xaci ša'a).
the-second also lasted.3F.SG half hour
'The first act lasted half an hour and the second one did too.'

c. A: ha-simla ha-kxula ola 220 dolar.
the-dress the-blue costs.3F.SG 220 dollar
'The blue dress costs $220.'
B: ve-gam ha-simla ha-aduma ola *(220 dolar)?
and-also the-dress the-red costs.3F.SG 220 dollar
'And does the red one also cost $220?'

d. ha-xava šelo ba-negev mistara'at al pney yoter me-150
the-farm his in.the-Negev sprawls on face-of more than-150
dunam, ve-ha-xava šelo ba-galil gam mistara'at *(al pney
dunams and-the-farm his in.the-Galilee also sprawls on face-of
yoter me-150 dunam).
more than-150 dunam
'His farm in the Negev sprawls across more than 150 dunams, and his farm in the Galilee does too.'

At first sight, the fact that measure arguments pattern with non-individual-denoting arguments is surprising. One might have thought that they denote degrees, which are in the domain of individuals. Indeed, traces that range over degrees are attested in various movement constructions; the LFs of examples (49a)–(49b) contain the expressions below them.

(49) a. How tall is John?
→ λd.*John is* d-*tall*

b. John is taller than Mary said he is
→ *λd.Mary said that he is d-tall*

However, a closer look at the syntactic and semantic properties of measure arguments reveals that they display the characteristic profile of *predicates*. Adger (1994: 99–108) lists a number of contrasts between measure arguments and standard referential nominals. First, they are antipronominal (50); second, like other predicative positions, they reject strong quantifiers (51); third, they produce sharp ungrammaticality when extracted from weak islands, whereas referential arguments only produce mild or no deviance (52) (Rizzi 1990).[17]

[17] All the examples in (50)–(52) are from Adger (1994: 99–103), except (51b).

(50) a. *Anson weighed 70 kilos and David weighed them too.
b. *The conference lasted three weeks and the film festival lasted them too.

(51) a. The conference last many/*most weeks.
b. Their family story spans hundreds of years/*each year.

(52) a. ?What do you wonder whether Anson saw?
b. *What do you wonder whether the book cost?
c. What didn't you think that Anson saw?
d. *What didn't you think that the book cost?

Furthermore, Adger noted that measure arguments cannot undergo scrambling in Turkish and Dutch because they do not introduce discourse referents, let alone familiar ones.

The semantic literature converges on the idea that measure arguments denote predicates, with views differing on the question—predicates of *what*? Schwarzchild (2005) takes them to denote predicates of intervals along some scale, Winter (2005) analyzes measure phrases as predicates of vectors, while Scontras (2014) analyzes them as simple predicates of individuals. The choice among these alternatives does not concern us here. What is important is measure arguments do not denote in the domain of individuals. Therefore, their resistance to pronominalization and to AE is predicted by (21).

4.4 Names in naming verbs

Evidence from antipronominal behavior and resistance to non-reconstructing movement suggests that the name argument of naming verbs is not individual-denoting, as demonstrated in (15)–(18). We now observe that this environment in Hebrew is also antipronominal, and crucially, resists AE.

(53) a. Hi kar'a la-xatul šela Geršon lifney še-ani karati la-xatul šeli
she called to.the-cat her Gershon before that-I called to.the-cat my
*(Geršon).
Gershon
'She called her cat Gershon before I called mine Gershon.'
b. *.... lifney še-ani karati la-xatul šeli oto.
before that-I called to.the-cat my it.M.SG
('... before I called my cat it.')

(54) A: Yosi kina et ha-ca'ad ha-ze ta'ut.
Yosi dubbed ACC the-meaure the-this mistake
'Yosi dubbed this measure a mistake'
B: Od anašim kinu et ha-ca'ad ha-ze *(ta'ut).
more people dubbed ACC the-meaure the-this mistake
'More people did so.'
B′: *Od anašim kinu et ha-ca'ad ha-ze ota.
more people dubbed ACC the-meaure the-this it.F.SG
('More people did so.')

Recall that such name arguments are higher-type properties (Matushansky 2008). Given (21), it is not surprising that they can neither be pronominalized nor host the *pro* placeholder for AE.

4.5 Predicate nominals

Following Landman (2006) and Poole (2017), I assume that because predicate nominals do not denote individuals, they can neither bind traces at LF nor introduce antecedents for pronouns, see (19) (but see fn. 10). In line with (21), we also expect them to resist AE.

(55a) and (56) illustrate failure of ellipsis of a predicate nominal, occurring as a verbal complement and as a small clause predicate, respectively; (55b) illustrates the failure of pronominalization in the former.[18]

(55) a. hi hafxa le-menahelet axarey še-ha-bat šela hafxa
she turned to-manager after that-the-daughter her turned
*(le-menahelet).
to-manager
'She turned into a manager after her daughter had.'

b. *... axrey še-ha-bat šela hafxa la.
after that-the-daughter her turned to.her
('... after her daughter turned to it.')

(56) ba-ma'arav tofsim et Stalin ke-rodan axzari aval lo tofsim
in.the-west perceive.3PL ACC Stalin as-despot ruthless but not perceive
et Putin *(ke-rodan axzari).
ACC Putin as-despot ruthless
'In the west, people perceive Stalin as a ruthless despot but not Putin.'

These findings are in line with previous literature, which has recognized that AE cannot apply to adjectival predicates (see Gribanova 2020 on Uzbek, and Portelance 2020 on Lithuanian).[19] The Hebrew facts are somewhat more compelling insofar as they teach us that even if one keeps to the core syntactic domain of anaphora—nominal expressions—predicates cannot undergo AE.

An apparent challenge to this generalization is posed by the following example, minimally different from (55a) in the choice of the finite verb.

(57) hi nihyta (le-)menahelet axarey še-ha-bat šela nihyta ___.
she became (to-)manager after that-the-daughter her became
'She became a manager after her daughter did.'

Although (57) appears to involve predicate ellipsis, I think it actually does not. The verb *nihya* 'become' is morphologically derived from *haya* 'be.' Not surprisingly, the

[18]The preposition *ke-* 'as' does not take weak pronouns as complements so this test cannot be applied in (56). A strong demonstrative pronoun would be acceptable (*ke-xaze* 'as such').

[19]I am aware of two potential counterexamples: ellipsis of an AP-complement of *become* in Japanese (Takahashi 2006: ex. 44b) and AP ellipsis inside a small clause in Serbo-Croatian (Bošković 2018: 25, fn. 29). Future research should carefully analyze such examples to evaluate their import.

latter can also be followed by an elided predicate (58a). In fact, in somewhat more formal Hebrew, *haya* 'be' renders the sense of *nihya* 'became' when followed by a dative-marked predicate nominal (58b).

(58) a. hi hayta menahelet axarey še-ha-bat šela hayta ___.
she was manager after that-the-daughter her was
'She was a manager after her daughter was.'
b. hi hayta le-menahelet axarey še-ha-bat šela hayta ___.
she was to-manager after that-the-daughter her was
'She became a manager after her daughter did.'

In Landau (2018), I observed that Hebrew has Aux-stranding VP ellipsis of the English type. This construction is derived in two steps: (i) raising Aux to T, and (ii) ellipsis of AuxP. Crucially, it does *not* involve bare predicate ellipsis; the predicate is simply contained in a larger verbal constituent targeted for ellipsis, namely AuxP. I propose that (57) is similarly derived because *nihya* 'become' is just as much an auxiliary as *haya* 'be' is. Schematic structures (omitting irrelevant details) are shown below.

(59) a. *PredP ellipsis in (55a)*
* [$_{TP}$ … [*hafxa*$_i$-T] [$_{vP}$ t_i [~~$_{PredP}$ *le-menahelet*~~]]]
b. *AuxP ellipsis in (57)*
✓ [$_{TP}$ … [*nihyta*$_i$-T] [~~$_{AuxP}$ t_i~~ [~~$_{PredP}$ *le-menahelet*~~]]]
c. *AuxP ellipsis in (58)*
✓ [$_{TP}$ … [*hayta*$_i$-T] [~~$_{AuxP}$ t_i~~ [~~$_{PredP}$~~ (*le-*)*m~~enahelet~~*]]]

Why, then, can (55a) not be derived in a parallel fashion, with raising of *hafxa* 'turned' out of VP, followed by VP ellipsis? Landau (2020a, 2020b) argues that V-stranding VP ellipsis derivations, in fact, are not attested for principled reasons. Object gap sentences may be derived in various ways—Null Complement Anaphora, *pro*-drop, operator movement or AE—but V-stranding VP ellipsis is not one of them. In contrast, Aux-stranding AuxP derivations are possible and indeed attested in many languages.[20] The contrast between (55a) (with a lexical verb) and (57) (with an auxiliary)—which are otherwise near synonyms—provides striking support for this particular approach to the interaction of head movement and ellipsis.

A final question is this: how can ellipsis in (57) target a property-denoting constituent, in apparent violation of (21a), where all the cases of such ellipses discussed above were ungrammatical for this very reason? The straightforward answer is that VP ellipsis (of which AuxP ellipsis is an instance) is fundamentally different from AE, and is *ipso facto* exempt from (21a). As discussed in Sect. 3.2, those elliptical constructions that are derived by PF-deletion of a syntactic constituent involve no variable at LF but a full syntactic structure; hence, the NHTV is irrelevant to them. VP ellipsis is one such construction, as amply argued in the literature (Johnson 2001; Merchant 2001; Aelbrecht 2010; van Craenenbroeck 2010; Baltin 2012; Aelbrecht and Harwood 2015).

[20]The crucial difference, according to Landau (2020b), is whether the raised verb crosses a spellout domain (VP but not AuxP). When it does, its trace can no longer mediate the deletion instruction to PF.

Thus, PF-deletion of AuxP in (57) takes no heed of the semantic type of AuxP. On the other hand, (55a) and (56), which cannot be derived by VP ellipsis, must resort to AE. This process involves *pro*-replacement (the specifics of which are laid out in Sect. 6) and is correspondingly constrained by (21a) to apply only to individual-denoting constituents. Ellipsis of predicates cannot arise from this mechanism.

5 Disconfirmation of V-stranding VP ellipsis

The empirical findings of the previous sections have one significant implication that I would like to highlight before moving on to the specifics of the analysis. As is well-recognized in the literature, it is notoriously difficult to tease apart AE from V-stranding VP-ellipsis (VSVPE), as the two derivations result in identical overt strings (i.e., [... V [e] ...]). Consequently, a fair amount of sophisticated efforts have been put into distilling and refining the few decisive tests that do exist (Goldberg 2005; Gribanova 2013, 2020; Simpson et al. 2013; Landau 2020a). The most robust test, which is the one most often used, involves the (non)inclusion of VP-adverbs in the ellipsis site (Park 1997; Oku 1998); see Landau (2020a) for a recent study targeting this phenomenon in three languages (Portuguese, Russian and Hindi). Yet even this test is possibly more involved and less transparent than one would like (Funakoshi 2016; Oku 2016; Rasekhi 2018). Recently, Landau (2021) presented another test, based on the interaction of negation and a conjoined object, which yields a truth-conditional difference between VSVPE and AE. Nonetheless, it is desirable to design additional, reliable tests that can distinguish the two analyses.

The five syntactic environments that resist AE because they host arguments that do not denote individuals, in fact, provide us with five novel tests. All these environments should *allow* genuine VP ellipsis, which does not fall under (21a). Here I follow the mainstream view that VP-ellipsis is derived by PF-deletion; and PF-deletions are oblivious to restrictions on semantic type (though, of course, they are indirectly correlated with other contentful semantic restrictions via [E]-licensing and the notion of e-GIVENness; see Merchant 2001, 2004). If indeed we find that genuine VP ellipsis is free of the semantic type constraints discussed in Sect. 4, the case for AE and against VSVPE as the correct analysis of object-gap sentences would appear to be incontrovertibly settled.

Hebrew allows such a minimal comparison as it manifests, alongside object gap sentences (here analyzed as AE), Aux-stranding VP gap sentences like (57)–(58), for which VP-ellipsis is the natural analysis. The auxiliary *haya* 'be' occurs with all nonverbal predicates, as well as verbal predicates in habitual and certain modal sentences (where the lexical verb shows up as a present participle). The examples below demonstrate that genuine VPE, in which both the verb and its argument(s) is/are missing, is insensitive to the semantic type of the argument.

(60) ✓*Chunk of non-decomposable idiom in VPE (cf. (25))*

A: hu haya tofes **taxat** (aleynu).
he was.3SG.M grab.PRTC.M.SG ass on-us
'He used to behave so arrogantly (to us).'

B: mi lo haya ___?
who not was.3SG.M
'Who didn't?'/ 'Who wouldn't?'

(61) ✓*Argumental adverb in VPE (cf. (46a))*

Yosi haya mitnaheg yafe lu axiv haya ___.
Yosi was.3SG.M behave.PRTC.M.SG well if brother.his was.3SG.M
'Yosi would have behaved well if his brother had.'

(62) ✓*Measure argument in VPE (cf. (48b))*

A: im ha-scena še-xataxnu, ha-ma'araxa ha-rišoona hayta
with the-scene that-cut.out.1PL the-act the-first was.3SG.F
nimšexet xaci ša'a.
last.PRTC.SG.F half hour
'With the scene we cut out, the first act would have lasted half an hour.'

B: lo, hi lo hayta ___.
no it not was.3SG.F
'No, it wouldn't have.'

(63) ✓*Name arguments of naming verbs in VPE (cf. (53a))*

A: ba-xayim lo hayiti kore la-xatul šeli Geršon.
in.the-life not was.1SG call.PRTC.SG.M to.the-cat her Gershon
'Never would I have called my cat Gershon.'

B: ani makir harbe anašim še-hayu ___.
I know many people that-were.3PL
'I know many people who would have.'

(64) ✓*Predicate nominals in VPE (cf. (55a))*

Dana niftera lifney sof ha-doktorat. Beyn im hayta
Dana passed.away before end the-doctorate between if was.3SG.F
hofexet le-marca min ha-minyan u-veyn im lo
turn.PRTC.SG.F to-lecturer from the-order and-between if not
hayta ___, barur še-haya cafuy la atid mazhir.
was.3SG.F clear that-was.3SG.M expected to.her future glorious
'Dana passed away before the end of her doctorate studies. Whether she had turned into a regular faculty member or not, a bright future would have awaited her.'

The systematic contrast between object gap sentences and VP gap sentences in their tolerance to non-individual denoting arguments indicates very clearly that the former cannot be reduced to the latter; that is, it falsifies the VSVPE analysis, in line with the conclusions of Landau (2018, 2020a, 2020b, 2021).

6 Analysis: *pro*-replacement after TRANSFER

In developing an analysis that is both empirically adequate and theoretically continuous with current understanding of syntactic computations and ellipsis, I will first set forth two boundary conditions. First, it will be shown that the mechanism of AE cannot be PF-deletion (Sect. 6.1), although that mechanism is perfectly suited to other

types of ellipsis. Then, it will be shown that LF-copying too is incapable of capturing certain properties of AE; specifically, the fact that overt subextraction is possible out of AE sites (Sect. 6.2). These two conditions seem to produce an insoluble paradox, but Sect. 6.3 will propose a way out: *pro*-replacement at the phase level, after TRANSFER, guarantees both non-pronunciation and an escape hatch for overt subextraction. Section 6.4 puts the system to work in two sample derivations.

6.1 The case against PF-deletion

The systematic exclusion of arguments that do not denote individuals from the domain of AE calls for a semantic constraint in the spirit of Landman's (2006) NHTV.

(65) *No Higher-Type Variables Constraint* (*NHTV*)
Variables in the LFs of natural languages are of type <e>.

We will shortly see that in order to capture the AE data, the NHTV should be strengthened to apply beyond LF. But the fundamental cut is correct, as can be seen in the following summary of the findings from Sect. 4.

(66) *Semantic types constrain AE*

	Semantic type	**AE**
Referential argument	<e>	✓
Chunk of non-decomposable idiom	–	*
Argumental adverb	<<e,t>,<e,t>>	*
Measure argument	<e,t> / <d,t> / <v,t>	*
Name in naming verb	<e,<n,t>>	*
Predicate nominal	<e,t>	*

In the context of the choice between PF-deletion or LF-copying as the appropriate analysis of a given ellipsis construction, the table in (66) makes a strong case against the former. By hypothesis, PF representations are stripped off semantic information, so they cannot depend on anything like the NHTV. Note that pushing back the semantic constraint into the syntax, as Merchant (2001) does with the presupposition of e-GIVENness encoded in the [E]-feature, is not an available option. There is certainly no *general* constraint against deleting nodes of type <e,t>, for example. This is precisely what VP-ellipsis and NP-ellipsis do. If the [E]-feature were to encode something as strong as the NHTV, these ubiquitous processes would become inexplicable. Once again, the reason they are unproblematic is because the [E]-feature regulates PF deletion and is not constrained by semantic type.

AE is fundamentally different; hence the conclusion that it does not utilize the [E]-route. This conclusion is already part of the mainstream view of AE (Saito 2007, 2017; Takahashi 2008, 2014; Sato 2019; Sakamoto 2020). What the present study adds to the picture is a novel set of arguments that makes variants of the LF-copying view particularly appealing for AE. Although we will eventually reject the mechanism of LF-copying, we will preserve one of its fundamental features: sensitivity to semantic types. This feature lies beyond the explanatory scope of PF-deletion.

Although AE in East Asian languages is not at the focus of this study, scattered observations in the literature suggest that the same semantic constraint attested in Hebrew AE applies in languages like Japanese and Korean as well (see (42) above). Sample data from Korean confirm a point-by-point parallelism: AE is excluded in all the five environments examined above, and, when testable, simple pronouns are too (Heejeong Ko, p.c.).

(67) a. *Chunk of non-decomposable idiom*

A: Cheli-ka ip-ey kemicwul-ul chi-ess-ta.
Cheli-NOM mouth-in spider.web-ACC spin-PST-DEC
'Cheli spun a spider web in (his) mouth.' (= 'Cheli starved.')

B: * Mina-to ip-ey ___ / kukes chi-ess-ta.
Mina-too mouth-in it spin-PST-DEC
(Intended: 'Mina starved, too.')

b. *Argumental adverb*

A: Ceypal nay atul-eykey *(chincelhi) tayhay-cwu-sey-yo.
please my son-DAT kindly treat-give-HON-POLITE
'Please treat my son kindly.'

B: Kekceng mal-ayo. *cey-ka tangsin atul-eykey __
worry NEG-POLITE I.NOM your son-DAT
tayhal-kkey-yo.
treat-PROM-POLITE
(Intended: 'Don't worry. I will treat him kindly.')

c. *Argumental measure phrase*

A: Na-nun mommwukey-ka 70 killo naka.
I-NOM weight-NOM 70 kilos weigh
'I weigh 70 kilos.'

B: * O! Nay-ka mommwukey-ka ___/ kukes nakan-ci kkoay
Oh I-NOM weight-NOM it weigh-since pretty
toy-ess-ne.
become-PST-DEC
(Intended: 'Oh, it's been a long time since I did.')

d. *Name in naming verbs*

*Na-nun ney-ka ney koyangi-lul ___ / kuekes(-ulo) pwuluki-ceney
I-TOP you-NOM your cat-ACC it(-as) call-before
nay koyangi-lul Alex-lo pwull-ess-e.
my cat-ACC Alex-as call-PST-DEC
(Intended: 'I called my cat Alex before you did.')

e. *Predicate nominal*

A: Cheli-nun kyosa-lo cal-ass-e.
Cheli-TOP teacher-as grow PST-DEC
'Cheli grew into a teacher.'

B: * Ku-uy hyeng-to ___/ ku-lo cal-ass-e.
he-GEN brother-too he-as grow-PST-DEC
(Intended: 'His brother did too.')

Further evidence that AE in Korean is constrained by semantic type is provided in Kim (2019). Kim observes that resultative nominal predicates (68a), possessee nominals of inalienable possession constructions (68b) and "verbal nouns" that form complex predicates (68c) all resist AE (Kim 2019: 70, 81, 124; RES is the predicative particle and LV is a light verb; note that (68b) allows an irrelevant reading where the missing *arm* is not recovered and Hani simply catches her older brother).

(68) a. Mapepsa-nun twu-myeng-uy wangca-lul kaykwuli-lo
magician-TOP two-CL-GEN prince-ACC frog-RES
mantul-ess-ta.
make-PST-DECL
'A magician turned two princes into frogs.'
*Manye-nun twu-myeng-uy kongcwu-lul ___ mantul-ess-ta.
witch-TOP two-CL-GEN princess-ACC make-PST-DECL
(Intended: 'A witch turned two princesses into frogs.')

b. Siwu_i-ka caki_i-uy ai-lul phal-ul cap-ass-ta.
Siwu-NOM self-GEN child-ACC arm-ACC catch-PST-DECL
'Siwu_i caught his_i child on the arm.'
*Hani_j-nun caki_j-uy oppa-ul ___ cap-ass-ta.
Hani-TOP self-GEN older.brother-ACC catch-PST-DECL
(Intended: 'Hani_j caught her_j older brother on the arm.')

c. Mina-nun ecey sasum-ul sanyang-ul ha-ess-ta.
Mina-TOP yesterday deer-ACC hunting-ACC LV-PST-DECL
'Mina hunted deer yesterday.'
*Siwu-nun onul chamsay-lul ___ ha-ess-ta.
Siwu-TOP today sparrow-ACC LV-PST-DECL
(Intended: 'Siwu hunted sparrow today.')

Kim proposes a configurational licensing condition: only specifiers of phases can undergo AE. However, barring stipulations, it is not clear that standard objects of transitive verbs occupy specifier positions (e.g., one would be forced to argue that the object is a specifier in *John weighed potatoes* but a complement in *John weighed 80 kilos*, with no independent evidence). Rather, what seems clear (and Kim does note it) is that all the failed ellipses in (68) target predicative arguments. Specifically, the resultative nominal in (68a) is of type <e,t>; possessee nominals in inalienable constructions are relational nouns that introduce a possessor argument, thus of type <e,<e,t>> (Partee 1997; Vikner and Jensen 2002); and verbal nouns are argument-taking predicates (Grimshaw and Mester 1988), so that *sanyang* 'hunting' in (68c) is of type <e,<s,t>>, combining with the light verb *ha-* by Event Identification (Jung 2003). Kim's observations, therefore, fall entirely under the NHTV. In fact, Kim (2019: 143) further observes that AE-resistant arguments also resist scrambling. If scrambling does not reconstruct, the resulting traces at LF would be of illicit higher types (Poole 2017), hence also excluded by the NHTV.

These facts are particularly challenging to the property-based view of AE espoused in Tomioka (2003) and Bošković (2018). While Hebrew is not an "NP language," Korean is; it should therefore harbor an <e,t>-type *pro*. Why can this *pro* not pick out property-denoting NPs as antecedents, not even the most straightforward

kind of them, a predicate nominal? If the property-based view of *pro* has any immediate prediction, it is that such NPs will make perfect antecedents for AE. The fact that they are not is extremely puzzling, and implies that for some unknown reason, *pro* must undergo type-shifting to an individual even in contexts that select for properties and *accept* property-denoting overt NPs. No such bizarre assumptions are needed on the present view, which takes *pro* to be individual-denoting to begin with, and derives the facts in (67)–(68) straightforwardly.

There is another property of AE that places it in opposition to well-established cases of ellipsis by PF-deletion, which concerns its relation to deaccenting. Tancredi (1992) famously argued that ellipsis is an extreme form of deaccenting, which allowed him to capture significant interpretive parallels between the two processes, like backgrounding, strict/sloppy readings, etc. (see also Chomsky and Lasnik 1993). While it is recognized that ellipsis imposes a stricter parallelism constraint than deaccenting does (see Merchant 2001: 15, 17), there are no circumstances, to my knowledge, where *strictly identical* constituents license deaccenting but not ellipsis.

In this light, consider environments in which AE fails (italics below indicate deaccenting).

(69) A: ani šokel 70 kilo.
I weigh.M.SG 70 kilo
'I weigh 70 kilos.'
B: *ha, ani kvar mi-zman lo šokel ___ !
huh I already from-time not weigh.M.SG
('Huh, I haven't weighed 70 kilos for a long time!')
B': ha, ani kvar mi-zman lo šokel *70 kilo*!
huh I already from-time not weigh.M.SG 70 kilo
'Huh, I haven't weighed 70 kilos for a long time!'

A measure argument can be deaccented if anteceded by an identical measure argument, but not elided. This is not a quirk of measure arguments; the observation generalizes, without exception, to all the kinds of ellipsis-resistant arguments discussed in Sect. 4 (examples are omitted here for space reasons). In other words, the semantic constraint banning deletion of non-individual denoting arguments is inoperative in deaccenting.

It is certainly not surprising that a PF-operation like deaccenting is indifferent to semantic type constraints. What is of interest here is the discrepancy with ellipsis. If AE had been an "extreme form of deaccenting," namely a PF-operation, it would have been no different in this regard. Moreover, because parallelism is not at stake here (the antecedent and elided constituents are identical in (69B)), we cannot appeal to the familiar mismatches between deaccenting and ellipsis that hinge on the strength of the parallelism requirements to which they are subject. The natural conclusion is that AE is simply not a PF operation at all.

As it stands, though, the NHTV in (65) does not deliver the empirical results we need. All it requires is that LF-variables are of type <e>. But on the *pro*-replacement analysis, the ellipsis site does not host a variable (*pro*) at LF, the latter having been replaced by an LF-copy of the antecedent. That copy, in the usual case, will simply be

some referential argument, with some lexical content and possibly phrasal structure. How can the NHTV restrict the semantic type of this constituent, which is not a variable?

It cannot. However, if we could somehow bring the anterior *pro* under the jurisdiction of (some modified version) of the NHTV, the desired result will follow: *pro* will be restricted to type <e>, and by transitivity, anything that replaces it will be too, assuming that replacement requires semantic type matching (in general, *pro*-forms can only pick out antecedents that match their semantic type).

The necessary modification in the NHTV is, in fact, a simplification. All we need to do is remove the qualification "at LF."

(70) *Generalized NHTV*
Variables in natural languages are of type <e>.

(70) is stronger than (65) and requires variables *at any derivational stage* to be of type <e>. In fact, it goes all the way back to the lexical inventories of natural languages, and prohibits atomic pro-forms of higher types.[21] This does have the effect of ruling out all the impossible AE cases above. Specifically, arguments of higher types cannot be licensed in the ellipsis site because there is no appropriate *pro* for them to replace. No *pro* in the lexical inventory of natural languages can be replaced by a non-denotational idiom chunk, by an adverb, by a predicate nominal, etc.

Thus, by extending the scope of Landman's (2006) original NHTV, we preserve its positive consequences (see Sect. 3) and also derive the semantic type constraint on AE. We now explain the correlation in (21c) and resolve the paradox from Sect. 2: how come AE is *not* interpreted as a pronoun at LF and yet is subject to the same semantic type constraint as pronouns are? The answer is: AE sites indeed do not host a *pro* at LF but rather a fully-fledged syntactic structure. However, they derivationally descend from a syntactic *pro*, and it is this *pro* that bears the mark of the generalized NHTV—the restriction to type <e>.[22]

[21] Phrasal pro-forms may, of course, denote outside the domain of individuals, as their basic semantic type is shifted by functors they combine with (see fn. 10). Note that (70) predicts not only that AE sites cannot denote properties but also that they cannot denote generalized quantifiers, aligning with Poole's (2017) constraint on trace denotations. This is indeed true, as I briefly demonstrate in Sect. 7, although the full case is laid out in Landau (to appear).

[22] The present proposal associates *pro*-forms with reconstructed syntactic structure, but it does not imply that they cannot be associated with PF-deletion in other elliptical constructions. Indeed, certain varieties of VP ellipsis have been analyzed precisely in such terms: PF-deletion of a VP node that strands an overt *pro*-form (Baltin 2012 on *do so* anaphora in English; Hauser et al. 2007 and Bentzen et al. 2013 on *gøre det*/*gjøre det* 'do it' anaphora in Danish and Norwegian, respectively). The *do so* case is fundamentally different in that the *pro*-form *so* is not a surrogate of the surface anaphor at all; rather, its *complement* is the target of ellipsis. The Scandinavian constructions do involve what seems like a property-anaphor, *det*, in the complement position of the light verb, but this is an illusion. Throughout the derivation and up to LF, the VP is a full syntactic structure, and *det* is inserted only at PF. Thus, *det* is not a syntactic or semantic variable, and perforce is not subject to the Generalized NHTV. Finally, the predicate anaphor *le* in French displays clear properties of a surface anaphor, e.g., allowing subextraction (Sportiche 1995); Sportiche, in fact, takes it to be a *propositional* anaphor (subsuming both the elided predicate and the extracted subject). Either way, it does not fall under the NHTV.

6.2 A challenge to *pro*-replacement at LF: Overt extraction

Now that we have set aside the PF-deletion approach, the precise implementation of LF-copying may take various forms. In the general literature on LF-copying, analyses mainly differ in what they take the target site to consist in *prior* to being filled by an LF copy of the antecedent.

(71) *Implementations of LF-copying*

a. *Merge/Substitution*

(i) The ellipsis site does not exist in the syntax and is only generated at LF (Oku 1998; Takahashi 2006, 2008, 2013, 2014; Saito 2007, 2017; Fortin 2011; Sato 2014, 2015, 2016, 2019).

(ii) The ellipsis site is an empty categorial frame in the syntax (Wasow 1972; Williams 1977; Chung et al. 1995; Elbourne 2005; Aoun and Li 2008).

b. pro-*replacement*
The ellipsis site hosts *pro* in the syntax (Yoshimura 1992; Lobeck 1995, 1999; Giannakidou and Merchant 1997; Sakamoto 2020).

Our argumentation allows us not only to rule out PF-deletion but also analyses of type (71a); a missing position, or just a bare category feature, are not referential elements that can be tagged with a semantic type restriction. Only *pro* can, which is indeed why we find a systematic correlation between AE-resistant and antipronominal environments.[23]

Nevertheless, I will depart from a *pro*-replacement analysis like Sakamoto's (2020) in one important respect: I will argue that the copying operation, as well as the replacement of *pro*, must take place *in the syntax*. This, of course, will raise the question of why the copied material is not pronounced in the ellipsis site; the next section answers this question. For now, let us review the reasons why a purely LF-copying analysis of AE is inadequate.

As a starting point, let me turn to the one type of argument that I have not touched upon so far in connection to AE: clausal arguments. The literature on AE in East Asian languages regularly extends it to clausal arguments as well, as they display no significant difference with nominal arguments (Saito 2007, 2017; Cheng 2013: 102). This is true of Hebrew too. First, given a local antecedent, any propositional verb may occur with a silent complement. In this respect, clausal AE is different from Null Complement Anaphora of the English type, which is lexically selective.

(72) Gil hitpa'er še-ha-proyekt šelo kibel hamon maxma'ot. gam Ronit
Gil boasted that-the-project his received lots.of compliments also Ronit
hitpa'ara ___.
boasted
'Gil boasted that his project received lots of compliments. Ronit also did.'
(cf. **Ronit also boasted* ___).

[23] (71b) can be viewed as a mirror-image of the early *Pronominalization* transformation of the 1960s: while the latter converted an NP into a pronoun under identity with antecedent NP, the former converts a pronoun into a DP under identity with an antecedent DP.

A striking feature of ellipsis that is hard to test with nominal arguments but easy with clausal ones is the possibility of extraction from the elided domain, probably the strongest type of evidence that this domain hosts silent syntactic structure. While English NCA disallows extraction from the complement domain (Depiante 2001), Hebrew clausal AE allows it (see Cyrino and Matos 2006 and Quer and Rosseló 2013 for parallel observations in Portuguese and Catalan Sign Language, respectively).

(73) naxeš eyze ma'amar Dan hiskim likro ve-eyze (ma'amar) hu
guess which article Dan agreed to.read and-which article he
serev ___?
refused
'Guess which article Dan agreed to read and which (article) he refused *(to)?'

Even more tellingly, morphosyntactic connectivity is respected in these extractions, similarly to what is found in sluicing, as Ross (1969) famously observed. The verbs *hika* 'hit' and *hirbic* 'beat' are near synonyms, but differ in how they mark their object: *hika* marks it accusative, *hirbic* marks it dative. This distinction must be preserved when the object is extracted out of an elided clause, or ungrammaticality results.

(74) a. et axiv, ani batuax še-Yosi haya make, aval
ACC brother.his I sure that-Yosi was.3SG.M hit.PRTC.SG.M but
et/*le- axoto, ani lo batuax ___.
ACC/to- sister.his I not sure
'His brother, I'm sure Yosi used to hit, but his sister, I'm not sure he used to.'

b. le-axiv, ani batuax še-Yosi haya marbic, aval
to-brother.his I sure that-Yosi was.3SG.M beat.PRTC.SG.M but
le-/*et axoto, ani lo batuax ___.
to-/*ACC sister.his I not sure
'His brother, I'm sure Yosi used to beat, but his sister, I'm not sure he used to.'

Such facts establish that AE extends to missing clauses in Hebrew (even if NCA is also available in some cases).[24] At the same time, however, they raise two thorny issues to the LF-copying analysis: (i) How is ellipsis of a propositional complement, which is of type <t> or <s,t>, compatible with the generalized NHTV, which restricts variables to type <e>? (ii) How can overt material be extracted from an LF constituent which, by hypothesis, is stripped off morpho-phonological information?

Consider question (i) first. In fact, there is a rich semantic tradition of assimilating propositional complements to (abstract) individuals: individual correlates of propositions (Chierchia 1984), plural individuals (Potts 2002), content individuals (Kratzer

[24] See Landau (2018: ex. 50) for Hebrew data on QR out of elided arguments and (a rare case of) overt subextraction out of an elided DP.

2006), content events (Moulton 2020) or attitudinal objects (Moltmann 2013). For a radical identification of propositions and individuals, see Liefke and Werning (2018). It is well-known that a wide range of grammatical processes treat nominal and clausal arguments alike. In the context of the phenomena discussed in Sect. 3.2, which involve linguistic variables, it is enough to mention their uniform behavior vis à vis *wh*-questions and pronominal anaphora.

(75) a. What do you regret?
My letter. / That I wasn't kind to them.
b. John said a [nasty word]$_i$. I was offended by it$_i$.
c. John said [that the storm was over]$_i$. I doubted it$_i$.

I cannot defend here at any length the general idea of "propositions qua individuals," or any one of its specific implementations. Nonetheless, I will assume, together with the authors cited above, that it is a credible idea: at some sufficiently general level of analysis, the denotation of clausal arguments and that of nominal arguments fall under the same ontological type. Let us assume, then, that the Generalized NHTV refers to that type by <e>. It follows that alongside DP and PP arguments, CP arguments are also eligible for AE.[25]

The second question, of extraction out of an LF copy, is at the heart of Sakamoto's (2020) illuminating study of AE in East Asian languages. Following Saito (2007), Sakamoto argues that overt extraction out of elided arguments is disallowed. However, he points out that covert extraction—including QR and null operator movements—*is* allowed. This asymmetry naturally follows on the LF-copying analysis. LF-copying may feed covert extraction because the latter does not have any impact on PF; but it cannot feed overt extraction as the latter has phonological consequences. In light of this account, the fact that Hebrew (and Portuguese) does allow overt extraction from AE sites in (73)–(74) is puzzling and seems like prima facie evidence for a PF-deletion analysis after all.

The dilemma is real, but I would like to suggest that PF-deletion is not the right way out of it (for the reasons discussed in Sect. 6.1). Before presenting a solution, let me point out that Sakamoto's neat dichotomy between (impossible) overt extraction and (possible) covert extraction out of elided clauses in Japanese has recently been called into question in Takahashi (2020) and Ohtaka (2021). Takahashi observes that although long-distance scrambling is not possible out of elided complements, focus movement in clefts is possible; Ohtaka argues that overt dative possessor raising is also possible out of elided objects. Ultimately, the LF-copying analysis might not be entirely adequate even for Japanese; the last word on this topic has not yet been said.[26]

[25]This view receives interesting support from Korean, where CP complements can undergo AE if and only if they are nominal (featuring a nominalizer and/or a case marker, the latter sometimes optional), a property that also underlies their susceptibility to pronominalization (Sohn 2012).

[26]The interpretation of extraction data with topic-marked (*wa*) constituents is not entirely settled; see Sakamoto (2020: 62, fn. 1) and Takahashi (2020: fn. 20).

6.3 The proposal: *pro*-replacement *after* TRANSFER

This is where things stand. We know that AE does not apply at PF because it reveals semantic sensitivity. We capture this sensitivity, which is also revealed in antipronominal behavior, by positing that AE sites start out as *pro*. We also know that the derivational point at which this *pro* is replaced by a syntactic constituent cannot be as late as LF, since that constituent can launch extraction of overt material, which furthermore displays morpho-syntactic connectivity with the ellipsis site. This leads to a wholly syntactic derivation of AE: both *pro*-insertion and *pro*-replacement take place before PF and before LF. The question we now have to address is this: how can a constituent, which is a syntactic object rather than an LF object, be left unpronounced?[27] I will approach this puzzle by taking a close look at the minimalist toolkit of phase-based derivation. The mechanism for deriving AE will emerge out of this toolkit as a logical consequence, hitherto unrecognized.

Prior to Minimalism, overt and covert movements were thought to be operations that take place in different modules of the grammar (May 1977; Huang 1982). Starting with Chomsky (1993), however, it became standard to assume a single syntactic module. The overtness of movement boiled down to which copy in the chain is targeted by spellout—essentially, a PF decision. An important updating of this picture occurred within the cyclic spellout model of the 2000s. Chomsky (2004) introduced the operation TRANSFER, which is triggered by the phase head, essentially shipping its complement to the interfaces and rendering it inaccessible to further computation. Classical cyclicity effects (*The Phase Impenetrability Condition*, PIC) are captured by allowing material within the phase's complement to escape only through movement to the phase edge prior to TRANSFER.

Within this model, Chomsky (2004: 111) reformulates the overt/covert distinction as follows: "Internal Merge can apply either before or after TRANSFER, hence before or after Spell-Out. The former case yields overt movement, the latter case covert movement, with the displaced element spelled out in situ."[28]

What stands out in this proposal is the peculiar restriction to *Internal* Merge. The peculiarity is all the more outstanding in light of Chomsky's persistent claim that Internal Merge and External Merge are formally indistinguishable, two facets of the same conceptual necessity (Chomsky 2008, 2013, 2019). While External Merge is expressed in Predicate-Argument saturation, Internal Merge is expressed in displacement. Yet Merge itself does not "care" whether its relata are members of a single connected tree or not. Thus, it is not clear why only Internal Merge enjoys free ordering with TRANSFER. Although the application of *External* Merge after TRANSFER (or after Spell-Out, in earlier terminology) has not been contemplated in the minimalist literature, it is an inevitable theoretical option, which can only be excluded by stipulation.

[27] On a Late Insertion model, the difference between the two is the presence of spellout instructions at the terminal nodes of the syntactic object vs. their absence from the LF-object (see Saab 2022, for a recent implementation).

[28] Chomsky further suggests that semantic interpretation is cyclically synchronized with phonological spellout, so that a single TRANSFER operation feeds both interfaces at every phase level. I take issue with this assumption below.

(76) *Merge by* TRANSFER *combinations*

	Before TRANSFER	**After TRANSFER**
Internal Merge	Overt movement	Covert movement
External Merge	Overt Predicate-Argument Saturation	?

This formal lacuna—"covert predicate-argument saturation"—is nothing but AE, I submit. In particular, AE is the process by which arguments undergo External Merge after TRANSFER (henceforth, *EMAT*) in the ellipsis site. Such arguments are still accessible to semantic interpretation, but are not visible to PF, just like copies of Internal Merge are after TRANSFER (overt movement). Importantly, on this analysis, the merged argument need not be an LF-object, and as I will shortly argue—it *cannot* be so. It may well be a regular syntactic constituent specified with phonological (or spellout) information. Nonetheless, having been merged after TRANSFER in the ellipsis site, it will not be parsed at PF.[29] This holds the key to the possibility of overt extraction from the AE site (see below).

Note that TRANSFER, on this view, and differently from Chomsky's (2004) view, does not feed LF. The object merged after TRANSFER escapes pronunciation but is clearly still interpreted. The idea that semantic interpretation is cyclic, parallel to spellout, raises other serious problems. Consider Internal Merge, which may apply before or after TRANSFER. Before Internal Merge, a *wh*-phrase is not interpretable; after Internal Merge, it is interpreted as an operator-variable chain. Thus cyclic TRANSFER to LF (if synchronized with TRANSFER to PF) would deliver two distinct outputs, one interpretable and one not interpretable, depending the timing of Internal Merge. In general, the very existence of "covert movement" and LF chains is puzzling from the standpoint of cyclic interpretation, since none of these dependencies are formed at the derivational point when this interpretation is supposed to be triggered (namely, when the phase head is introduced). Note also that there is nothing like the PIC on the semantic side; LF-structures must be able to ignore phase boundaries in order to construct configurations of long-distance binding. Thus, I keep to the assumption that TRANSFER feeds PF alone (as the classical Spellout operation did).

A number of issues need to be addressed at this point. First, why is *pro*-replacement the only way of achieving EMAT? What rules out simple substitution into an empty position, as in the family of proposals in (71a)? This is a crucial point. It is only in virtue of the underlying presence of *pro* in the AE site (prior to its replacement) that the effects of the Generalized NHTV are captured. Without *pro*, direct Merge of a phrasal argument in the AE site would simply duplicate whatever semantic type the antecedent has. The "semantic channelling" that rules out predicative or adverbial arguments reflects the impact of the Generalized NHTV on *pro*. But why is *pro* necessary?

[29] In this respect the present proposal is also different from Fortin (2011), where Sluicing is analyzed as copying of the LF structure of an antecedent TP. Fortin assimilates this operation to sideward movement (Nunes 2004), a nontrivial step, since sideward movement requires access to a syntactic object embedded inside a bigger one; this powerful device is not needed on the present analysis. In addition, sideward movement is wedded to a complex algorithm responsible for PF-deletion of copies unrelated by c-command. Since the mechanism of "obtaining silence" in AE is fundamentally different from PF-deletion, I will not pursue this analogy here.

To answer this question, we should reconsider the status of the construct "LF-copy," so far borrowed unexamined from the ellipsis literature. The idea is that LF-structures of completed derivations, sometimes completed sentences, are available to the syntactic computation. In particular, Merge can access a constituent of such an LF-structure, however deeply embedded, and "reuse" it in a new derivation, merging it with the currently constructed syntactic object. However, it is doubtful that Merge or syntax should be granted such power (see Epstein et al. 2012 for arguments against granting such power). Restricting resources is a minimalist desideratum that should not be hastily compromised (Chomsky 2020). It is not so much that post-TRANSFER objects should not be accessible; they *are* accessible to Internal Merge ("covert movement"). Rather, it is that fully derived sentences, having been spelled out at PF and interpreted by the semantics, should not remain in the syntactic workspace at all, or else it may grow incredibly big and complex.

If this reasoning is correct, then the source of the "copied" argument is not the LF-structure of the antecedent clause at all. What could it be? Quite simply, a newly constructed phrase, that is identical to the antecedent argument. This phrase, say a DP, is assembled like any other DP is, from the lexicon, and at the right moment—just after TRANSFER at the phase level in which *pro* occurs, replaces *pro* (step-by-step derivations are presented below). Crucially, now, this DP has never gone TRANSFER, since it has never been part of any bigger structure before it replaced *pro*. It is therefore endowed with the ordinary spellout instructions that are associated with any lexical material.

We are now in a position to answer the first question: what rules out simple substitution into an empty position in the AE site? As just indicated, LF-copies are not available. The only thing that can be used to replace *pro* is a newly constructed syntactic phrase, which is obviously available in the workspace. However, in order to escape pronunciation in the AE site, it must undergo EMAT. This implies that the argument position is left unfilled until the phase level. I suggest that the grammar of c-selection simply does not tolerate empty positions (a corollary of bare phrase structure), whether radically empty or just "categorial frames." Syntactic nodes exist only insofar as they are projected from actual morphemes.

In short, direct substitution of an LF-copy in the AE site is impossible because LF-copies are not syntactically accessible objects (at least not from previously completed derivations). A newly constructed syntactic argument, in turn, contains spellout instructions, so must be merged after TRANSFER to go unpronounced.[30] But c-selection cannot be suspended that long; once V is introduced, its DP/PP/CP argument must be merged, and cannot wait until the phase head v is introduced. Thus, *pro* must be merged for the derivation to proceed properly.

A second, obvious, concern, is how to restrict EMAT so that it does not generate meanings that are wildly underdetermined by the overt string. For example, in an

[30]Can *pro*-replacement occur before TRANSFER? If it can, the result would not be distinguishable from direct Merge of the argument, so the point is moot. A reviewer also asks whether EMAT can replace an *overt* pronoun. Theoretically, this should be possible; the replacement would only affect LF, keeping the overt pronoun at PF intact. This way of generating overt surface anaphors would be a mirror-image of overt surface anaphors generated at PF (see fn. 22). In fact, pronominal clitics in Catalan and Serbo-Croatian may well instantiate this option (Quer and Rosseló 2013; Runić 2014; Bošković 2018).

AE language like Hebrew or Japanese, why can the sentence *John ate*, uttered out of context, not be interpreted as *John ate* [*a veggie burger that was actually quite delicious*], with the bracketed phrase undergoing EMAT?[31] Clearly, such a meaning is neither recoverable from the sentence itself nor from its surrounding context. It is therefore ruled out by *Recoverability of Ellipsis* (RoE), a more neutral term than Recoverability of Deletion. The familiar constraint on surface anaphora is operative here as elsewhere: the content of silent syntactic material must be recoverable from its immediate linguistic context. Notice that on this view, non-recoverable EMAT is syntactically (and often semantically) well-formed. It is not blocked grammar-internally, but simply produces utterances that are hopelessly uninterpretable in discourse.[32]

6.4 AE derivations

Let us now put together the different pieces of the analysis and illustrate how they are manifested in the derivation of AE. We will first consider a simple AE example (77), and then an example with extraction out of the AE site (78).

(77) Gil ohev et ha-šxuna šelo, ve-Rina sonet
Gil likes ACC the-neighborhood his and-Rina hates
~~et ha-šxuna šela~~.
ACC the-neighborhood her
'Gil likes his neighborhood, and Rina hates hers.'

The derivation of (77) is depicted in Fig. 1, using English words for convenience. Movement copies are struck through, transferred material appears in bold, and material that undergoes EMAT is shaded. *EM* is external merge and *IM* is internal Merge. Parallelism applies in the manner familiar from other ellipsis phenomena.[33]

Note that the argument replacing *pro* in Fig. 1 (f) does not appear with a strikethrough because it has not undergone TRANSFER. Nevertheless, it is unpronounced, since it has been introduced after TRANSFER had applied to its phase, and subsequent spellout cycles will not apply to it, as they halt at the edge of the vP containing the silent argument. It is also apparent that EMAT is countercyclic, a property it shares with most implementations of LF-copying. This aberration may be tolerated for two reasons. First, EMAT's countercyclicity is restricted to a single phase, and if indeed, as Chomsky (2004) suggests, all conditions are evaluated at the phase level, EMAT is not registered as a violation. Second and more importantly, if the Extension Condition (barring countercyclic Merge) is rooted in linearization, as Fortin (2011)

[31] I return below to the question of what determines whether a language allows AE or not.

[32] This raises the intriguing possibility that unconstrained EMAT may apply in inner speech, where RoE is not at issue, as the content of merged arguments, whether overt or not, is always recoverable to the speaker. It is well-known that inner speech has phonological structure (Langland-Hassan and Vicente 2018), which indicates that its constituents undergo TRANSFER to PF (later aborted en route to the speech articulators). The often-made observation that it is more fragmentary and abridged than overt speech may be partially explained in terms of pervasive use of EMAT.

[33] Parallelism domains are relevant to recoverability whenever the ellipsis site contains a variable bound from the outside (Takahashi and Fox 2005), whether a pronoun (77) or a trace (78). There are more recent reformulations of this concept, but the choice among them is not relevant for the present concerns.

Syntax
a. EM {*hates*$_V$,*pro*} → [$_{VP}$ *hates pro*]
b. EM {v,VP} → [$_{vP}$ v [$_{VP}$ *hates pro*]]
c. IM {v,*hates*} → [$_{vP}$ [*hates*$_i$ v] [$_{VP}$ *hates*$_i$ *pro*]]
d. Construct a DP argument: [$_{DP}$ *her neighborhood*]
e. TRANSFER VP →[$_{vP}$ [*hates*$_i$ v] [$_{VP}$ ***~~hates~~***$_{i}$ ***pro***]]
f. Replace *pro* by DP (EMAT) → [$_{vP}$ [*hates*$_i$ v] [$_{VP}$ ***~~hates~~***$_{i}$ [$_{DP}$ *her neighborhood*]
g. EM {*Rina*,vP} → [$_{vP}$ *Rina* [$_{v'}$ [*hates*$_i$ v] [$_{VP}$ ***~~hates~~***$_{i}$ [$_{DP}$ *her neighborhood*]]]]
h. Complete TP:
→ [$_{TP}$ *Rina* [$_{T'}$ T [$_{vP}$ ***~~Rina~~*** [$_{v'}$ [hates$_i$ v] [$_{VP}$ ***~~hates~~***$_{i}$ [$_{DP}$ *her neighborhood*]]]]

PF
Output string: *Rina hates*

LF structure
[$_{TP}$ *Rina* λx [$_{T'}$ T [$_{vP}$ ***~~Rina~~***$_x$ [$_{v'}$ [hates$_i$ v] [$_{VP}$ ***~~hates~~***$_{i}$ [$_{DP}$ *her*$_x$ *neighborhood*]]]]
[λx.x hates x' neighborhood](Rina)

Semantics
Verify recoverability of a parallelism domain that (reflexively) dominates the AE site.

Fig. 1 Derivation of AE

suggests, then countercyclic Merge of *silent* material, which is not linearized, may be harmless.

Consider next the derivation of extraction out of an AE site (78) in Fig. 2, again using English words for convenience. I assume that AP predicates project a phase head *a* (alternatively, a Pred head), and suppress irrelevant movement copies.

(78) le-axiv, ani batuax še-Yosi haya marbic, aval
to-btother.his I sure that-Yosi was.3SG.M beat.PRTC.SG.M but
le-axoto$_i$, ani lo batuax [~~še-Yosi haya marbic t$_i$~~].
to-sister.his I not sure that-Yosi was.3SG.M beat.PRTC.SG.M
'His brother, I'm sure Yosi used to beat, but his sister, I'm not sure he used to.'

Let us unpack this derivation. The argument to be elided is the CP constructed in Fig. 2 (d). The internal PP argument is the target of extraction out of the AE. A matrix probe can only target this argument if it is located at the edge of the CP. Notice that any spellout decisions made internally to the CP will be later "trumped," as the entire CP (except for the argument extracted to its specifier) will remain unpronounced, due to EMAT in the matrix clause. This is no different from other situations in which a CP copy is left unpronounced, e.g., *That Mary kept the letter was not immediately understood*: any spellout decisions made inside the base copy of the fronted CP are trumped by the overarching instruction not to pronounce the entire copy.

Syntax
a. EM {$sure_{A}$,*pro*} → [AP *sure pro*]
b. EM {*a*,AP} → [aP *a* [AP *sure pro*]]
c. EM {*a*,*sure*} → [aP [$sure_{i}$,*a*] [AP $sure_{i}$ *pro*]]
d. Construct a CP argument with extraction to its edge:
[CP [PP *to his sister*] *that* [TP *Yosi was beat* [PP ~~*to his sister*~~]]]
e. TRANSFER matrix AP: → [aP [$sure_{i}$,*a*] [AP ***sure*** $_{i}$ ***pro***]]
f. Replace *pro* by CP (EMAT)
→ [aP [$sure_{i}$,*a*] [AP ~~***sure***~~$_{i}$ [CP [PP *to his sister*] that [TP *Yosi was beat* [PP ~~*to his sister*~~]]]]]
g. EM {*I*,aP}
→ [aP *I* [$_{a'}$ [$sure_{i}$,*a*] [AP ~~***sure***~~$_{i}$ [CP [PP *to his sister*] that [TP *Yosi was beat* [PP ~~*to his sister*~~]]]]]
h. IM {[PP *to his sister*],aP}
→ [aP [PP *to his sister*] [aP *I* [$_{a'}$ [$sure_{i}$,*a*] [AP ***sure*** $_{i}$ [CP [PP ~~*to his sister*~~] that
[TP *Yosi was beat* [PP ~~*to his sister*~~]]]]]]
i. Complete TopP
[TopP [PP *to his sister*] [TP *I not sure* … [CP [PP ~~*to his sister*~~] *that Yosi*…]]]

PF
Output string: *To his sister, I not sure*

Semantics
Verify recoverability of a parallelism domain that (reflexively) dominates the AE site

Fig. 2 Derivation of extraction out of an AE site

EMAT of the CP in Fig. 2 (f) guarantees that its terminal nodes will not undergo spellout *within the matrix AP*, the spellout domain of the phase head *a*. Yet using edge-to-edge extraction and the systematic "loophole" afforded by the PIC, the extracted PP ends up in a higher spellout domain, and is ultimately pronounced wherever the top copy of its chain is, here [Spec,TopP]. Now we can see the critical difference between an LF-copying approach and the present analysis. Because the AE site comes to host a genuine syntactic object, along with its spellout instructions, overt material can be extracted from it. Furthermore, this material displays morphosyntactic connectivity with its base position (see (74)), just like any other type of extracted material. In this respect, the EMAT analysis aligns with the predictions of a PF-deletion analysis and against LF-copying.

Finally, semantic parallelism establishes identity between an elided domain with a movement variable inside of it and antecedent domain with a parallel variable. I assume that the machinery developed by Merchant (2001) to derive identity in analogous sluicing derivations is readily transposable to the present case. ∃-closure applies to free variables, and the contrastive extracted arguments induce alternatives that are each contained in the focus semantic value of the other, thus mutual entailment is guaranteed between the antecedent and the AE site.

7 Consequences and questions

In this section I touch upon issues that the present proposal raises, offering somewhat sketchy remarks due to space limitations. Some of these issues are addressed in forthcoming work, others await further research.

The first issue is the status of elided QPs. Generalized quantifiers are of type <<e,t>,t>, hence should fall together with the other "non-individual" types in the table in (66) in resisting AE. We expect the following outcome.

(79) *Generalized NHTV* ⇒ *AE of QPs

Initial appearance, however, suggests otherwise, as in (3), repeated below.

(80) a. afiti harbe ugiyot. Mixal gam afta ___/ # otan.
baked.1SG many cookies Mixal also baked.3SG.F them
'I baked many cookies. Mixal did too.'
b. ani makir kol student ba-kita ha-zot. gam ata makir ___/#oto.
I know every student in.the-class the-this also you know him
'I know every student in this class. You do too.'

(80a) is not really informative, though. Cardinals and weak quantifiers like *many* may receive non-quantificational, modifier-denotations. In fact, Sato (2016) adopts a non-quantificational, choice-function analysis, to handle AE of wide-scope cardinal DPs in Singapore English. In general, as Tomioka (2014) observes, such elided arguments cannot solidly establish that AE applies to genuine quantificational phrases. It is noteworthy that the vast majority of studies purporting to show that AE applies to QPs restrict themselves to such examples, e.g., with the missing argument referring to 'three students' (Şener and Takahashi 2010; Cheng 2013; Sato 2014, 2015; Sato and Karimi 2016; Sakamoto 2020). Nonetheless, an early recognition of the contrast between grammatical ellipsis of weak quantifiers vs. ungrammatical ellipsis of strong quantifiers is found in Giannakidou and Merchant's (1997) analysis of Indefinite Object Drop.[34]

Let us focus on strong quantifiers, then. Examples with universal quantifiers, like (80b), may suggest that (79) is false. However, as Takahashi (2008: fn. 9) observes, the reading obtained is very difficult to distinguish from an E-type reading. Notice that a *plural* pronoun in (80b) easily renders this reading.

(81) ani makir kol student ba-kita ha-zot. gam ata makir otam.
I know every student in.the-class the-this also you know them
'I know every student in this class. You also know them.'

Thus, we are left with a very narrow selection of strong quantifiers that can make an indisputable case for a generalized-quantifier denotation of an AE site. QPs headed by *most* are suitable, and Takahashi (2008: ex. 11, 13) indeed provides such data; however, he notes that only the E-type reading is available to some speakers. Further complications internal to the LF-copying analysis arise, since these QPs are represented as operator-variable chains at LF, hence LF-copying "splits apart" the an-

[34]Giannakidou and Merchant's (1997) explanation is syntactic, though, unlike the present semantic explanation. They assume that strong quantifiers reside in D whereas weak ones attach below it. Because D is the head-licensor of nominal ellipsis, it cannot be included in the ellipsis site. Notice that this account cannot generalize to languages where AE applies to definite (hence, full DP) arguments, which nonetheless display a parallel ban on ellipsis of strong quantifiers. Below I sugggest that head-licensing is anyway operative in PF-deletion only, so it does not constrain AE (which is derived by EMAT).

tecedent chain, copying only a variable (see Saito 2017). Some non-QR mechanism is then called upon to interpret elided QPs.

I would like to take a different tack and argue that these appearances notwithstanding, (79) is true; and indeed, the fact that it is a direct consequence of the present analysis is striking confirmation of this analysis, on a par with the evidence accumulated against AE of predicative types. Only sample evidence will be presented here; for a full exposition, I refer the reader to (Landau to appear).

A truly quantificational element in an AE site should interact scopally with other scope-bearing elements. Yet whenever the resulting reading of such an interaction is truth-conditionally distinct from what an E-type denotation produces—it is, in fact, absent. This strongly suggests that only the E-type denotation is available. Below, I demonstrate this point with three independent tests.

Consider first the interaction of universally quantified objects with negation.

(82) Rina lo kar'a kol ma'amar ba-rešima. ¬>>∀, ∀>>¬
Rina not read every article in.the-list
'Rina didn't read every article on the list.'

(83) a. Rina kar'a kol ma'amar ba-rešima...
Rina read every article in.the-list
'Rina read every article on the list...'

b. Yosi lo, hu kara et rubam. ¬>>∀
Yosi not he read ACC most.of-them
'Yosi didn't, he read most of them.'

c. #Yosi lo kara, hu kara et rubam. *¬>>∀
Yosi not read he read ACC most.of-them
('Yosi didn't read them, he read most of them.')

(82) is scopally ambiguous; the surface scope relation ¬>>∀ is completely natural. The elliptical clauses (83b), (83c) are biased towards this surface scope, as the inverse scope would conflict with the following clause (if every article is such that Yosi did not read it, then he could not have read most of them). There is a sharp contrast between the stripping version (83b), in which the stranded negation can take scope over the QP inside the elided clause, and the AE version (83c), in which negation *cannot* scope over the elided argument.[35] This is readily understood if stripping involves PF-deletion of a VP or TP (Wurmbrand 2017; Johnson 2019), in which a genuine QP resides and is interpreted at LF, whereas AE proceeds by *pro*-replacement, which cannot apply to strong quantifiers. The object gap in (83c) can only receive an E-type reading, causing the conflict with the subsequent clause.

Next, consider downward-entailing (DE) quantifiers. These cannot be elided by themselves (84b, B) and may only go missing under a larger ellipsis (e.g., stripping). Upward-entailing quantifiers, in contrast, readily undergo AE (84a, B).[36]

[35] See Ahn and Cho (2011) for a parallel observation in Korean.

[36] See Tomioka (2014: 257) for the original observation in Japanese.

(84) a. A: ani makir yoter me-xaci me-ha-anašim kan.
I know more from-half from-the-people here
'I know more than half the people here.'
B: gam ani (makir) ___.
also I know
'Me too.'

b. A: ani makir paxot me-xaci me-ha-anašim kan.
I know less from-half from-the-people here
'I know less than half the people here.'
B: gam ani (# makir) ___.
also I know
'Me too.'

Constant (2012) pointed out that DE quantifiers cannot occur in positions reserved for type <e> expressions; e.g., *Those people standing over there are some/#few of my best students*. He traced this property to a semantic constraint on choice functions—they must be express *witnessable* determiners. Kurafuji (2019) links this constraint to AE in Japanese by interpreting AE sites through choice functions. More neutrally, we may take the impossibility of eliding unquestionably strong DE quantifiers as another indication that only type-<e> arguments may undergo AE.

As a third piece of evidence against quantificational meanings in AE, consider sentences where a universal QP in object position takes scope over an existential QP in subject position via QR. As mentioned above, E-type readings mimic such wide-scope readings for universal QPs. We can force the true quantificational reading for the QR-ed universal QP by making the existential QP necessarily distributive, e.g., by modifying it with *šone* 'different.' Once this is done, the effect of AE becomes clear.

(85) a. ba-xodeš še-avar, lakoax šone hizmin kol parit.
in.the-month the-this customer different ordered every item
'This month, a different customer ordered every item.'

b. *gam ba-xodeš ha-ze, lakoax šone hizmin ___.
also in.the-month the-this customer different ordered
('This month too, a specific different customer ordered every item.')

Without context, (85a) strongly favors the internal (bound) reading of *different*: the customers that bought the items were all different from one another. This reading is obtained by QR of the universally quantified object over the distributed existential subject. The following AE sentence (85b), however, is ungrammatical. An inverse scope reading, parallel to the one in the antecedent clause, is ruled out, as it would require a genuine universal QP to undergo AE, in violation of the generalized NHTV. Direct scope (one specific customer, different from some previously known set of customers, ordered all the items), on the other hand, would violate the parallelism constraint on ellipsis, which requires isomorphic scope relations in the antecedent and the elliptical clauses (Fox 2000; Takahashi 2008; Maeda 2019).

I now turn to a number of broader consequences and open questions that are raised by the present study.

Our analysis combines features of both the PF-deletion and the LF-copying approaches, but invokes neither deletion nor copying. I have been assuming all along that PF-deletion is well-motivated for other elliptical constructions. But is LF-copying equally needed? Skepticism is warranted. The particular mechanism of LF-copying employed in previous analyses of AE, I argued, is inordinately powerful, requiring the workspace to include too many accessible syntactic objects. One may question the necessity of *Copy* itself as an elementary operation. *Copy* automatically occurs as part of Merge (internal or external), but it is not clear that it has a life of its own. The present analysis dispenses with it altogether: the argument merged in the AE site is not copied from the antecedent but independently assembled from the numeration (see derivations for (77), (78)). To the extent that minimizing the inventory of basic operations is a desideratum of syntactic theory, this seems like a step in the right direction.

Consider next the issue of crosslinguistic variation, or more narrowly, the question of what the AE parameter is. Existing proposals, which tie the parameter to the presence/absence of scrambling, agreement, or agglutinative ϕ-morphology, cannot do justice to the data at its fullest diversity. I have nothing insightful to contribute to this challenging topic. Nonetheless, within the present proposal, one crosslinguistic distinction is already expressible: that is the distinction between AE languages that also allow discourse *pro* (like Japanese) and AE languages that do not (like Hebrew).

The distance between the two types of null arguments is not so big. In fact, both derivations start out the same way—with *pro* in the argument position. Discourse *pro* languages allow this *pro* to persist to LF because they possess whatever pragmatic strategies necessary to retrieve its content from context. Pure AE languages, like Hebrew, lack these strategies; an unreplaced *pro* at LF will remain uninterpretable, thus AE (by EMAT) is required in order to obtain an interpretable result.

This picture suggests two further loci of crosslinguistic variation. First, languages with no *pro* whatsoever, like English, will obviously lack AE. Second, something must block AE in *pro*-drop languages that are *not* discourse *pro* languages, at least in some of them (e.g., Spanish; see Oku 1998). This was meant to be the role of the anti-agreement parameter, but exceptions exist, such as Hebrew, Russian, Basque, Persian, Egyptian Arabic and Brazilian Portuguese. I tentatively follow Sakamoto's (2020: 233) intuition that *pro* in certain languages is too richly specified to be replaced by an argument. Spelling out the consequence of this hypothesis will take us too far afield, but it will likely involve comparing paradigms of overt pronouns and searching for additional contrasts between the syntactic activity of *pro* arguments in the relevant languages.

Finally, the present study brings into sharper focus certain differences between the two grammatical mechanisms of generating ellipsis in natural language, which, in one way or another, have always been acknowledged. The first mechanism, pioneered in Ross (1969), involves PF-deletion of syntactic constituents that are present at all derivational stages. The second one, pioneered in Wasow (1972), involves introducing a silent syntactic constituent at some derivational stage, in a position which was empty or nearly empty (=*pro*) prior to that stage. The two processes are subject to similar, if not identical semantic parallelism constraints, but exhibit a number of important differences. Let me focus on two such differences that clearly emerge from the present study.

First, the issue of semantic type constraints. As argued extensively above, ellipsis by *pro*-replacement exhibits distributional restrictions that are naturally traced to restrictions on admissible semantic types for variables in natural language. This signature property is absent from ellipsis by PF-deletion, in which the ellipsis site is not a variable at any derivational stage. Any category of any semantic type may be elided at PF insofar as this elision is licensed syntactically. Thus, we have a powerful diagnostic tool to tease apart the two processes, whose outcomes are often deceptively similar.

Second, the issue of syntactic licensing. PF-deletion is sensitive to formal features of its syntactic environment in a way that *pro*-replacement is not. As is well-known, the [E]-feature that licenses ellipsis by PF-deletion can be very particular in what syntactic heads it chooses to lodge on, distinguishing between interrogative and relative C, finite and nonfinite T, root and epistemic modals, possessive and not possessive D etc. None of this sensitivity is attested in AE. For example, nowhere in the vast literature on AE has it ever been indicated that arguments can be elided only in finite but not in nonfinite clauses or only under root modals but not under epistemic ones. Such distinctions are simply not accessible to the mechanism underlying AE, which is *pro*-replacement by EMAT. This provides us with another powerful diagnostic tool to tease apart the two processes.

Questions now arise on the horizon of current understanding. While we understand why varieties of predicate ellipsis must involve PF-deletion (there being no suitable *pro* to mediate the other ellipsis strategy), we still miss a principled account of why AE *cannot* proceed by PF-deletion. Recall that if it could, we would fail to capture the generalized NHTV effects. Some pertinent ideas are found in Bošković (2014) and Sakamoto (2020). Bošković proposes that either phases or phase complements (=spellout domains) can be targeted by ellipsis. Sakamoto (2020: 203) further proposes that phasal ellipsis is implemented by LF-copying while phasal complement ellipsis is implemented by PF-deletion. Note that the former corresponds to AE and the latter to Sluicing (deletion of the complement of the phase head C), VP ellipsis (deletion of the complement of the phase head Voice) and NP ellipsis (deletion of the complement of the phase head D).

However, the idea that PF-deletion can only target phase complements necessitates a dynamic approach to phases (Bošković 2014), given the well-known flexibility in the verbal projection targeted for ellipsis in sentences with a sequence of modals and auxiliaries. In addition, it must accommodate analogous Sluicing data, where the *wh*-remnant is followed by some left-edge constituents (Marušič et al. 2018; Temmerman 2019).

The alternative, which keeps phases invariant, is to permit [E]-licensing to apply under c-command and not just under strict sisterhood, utilizing Agree on some independent formal feature (Aelbrecht 2010). Pursuing this direction, the absence of AE by PF-deletion turns into the question of what blocks the formation of an Agree relation between the [E]-bearing head and its c-commanding licensor. In Landau (2020b) it is proposed that the [E]-bearing head X projects the elided XP (rather than being its sister). This means that D, P and C, qua heads of argument phrases, should bear some common uninterpretable feature [uF], which is checked against the licensor head—be it v, Voice or T. Yet it is hard to imagine what that [uF] might be (can P agree

with v or with T?). VP ellipsis and sluicing piggyback *independently* attested agreement relations (between V and T and between T and C, respectively). No comparable agreement relation seems to be available to mediate AE; perhaps there is nothing more to it. These are no more than suggestive remarks; future work will ultimately have to decide the matter.

8 Conclusion

Classical studies of ellipsis have focused on VP ellipsis, sluicing and NP-ellipsis. AE jumped onto the wagon relatively late, beginning in the end of the 1990s. It has always been recognized that AE is somewhat different from the better-understood elliptical processes, but many questions remained as to the nature of the differences. This study contributes to sharpening the differences and deriving them from fundamental syntactic principles.

At the empirical level, this study establishes a novel generalization: elided arguments must be of type <e>, a special case of an overarching constraint on variables in natural language. This constraint rules out ellipsis of non-denotational idiom chunks as well as of a range of higher-type arguments: adverbial arguments, names in naming verbs, measure phrases and predicate nominals. Generalized quantifiers are also not allowed to undergo AE, once the relevant readings are carefully isolated. The fact that the constraint holds in languages unrelated genetically or areally as Hebrew and Korean suggests—pending further research—that it is somehow a fundamental, possibly universal feature of language.

This semantic type constraint on AE is naturally explained if the AE site hosts a silent variable, namely *pro*. To reconcile this conclusion with the robust evidence for internal structure, as well as with the existence of non-pronominal readings of the elided argument, I have proposed that *pro* is replaced by a syntactic argument in the course of the derivation. That argument must be identical (in the relevant sense of "ellipsis parallelism") to the antecedent argument, but is not copied from it, since copying a subsconstituent of an LF structure is, presumably, not possible. This analysis resolves the surface paradox—the conflicting evidence both for *pro* and for syntactic structure—by reference to derivational opacity.

Finally, to explain how a syntactic constituent can be introduced without being pronounced, I proposed a natural extension of "post-TRANSFER Merge": while Internal Merge after TRANSFER results in covert movement, External Merge after TRANSFER results in AE: a fully interpreted argument that escapes spellout (although it may launch overt subextraction). As long as the content of this argument is recoverable from the local linguistic context (satisfying e-GIVENness), this operation is legitimate. In fact, it would take an unmotivated stipulation to allow internal but not external Merge after TRANSFER.

The emerging picture neatly divides into two types of ellipsis: PF-deletion vs. *pro*-replacement. The former type displays *syntactic* sensitivity to the environment of the ellipsis site, while the latter displays *semantic* sensitivity to its semantic type. Important questions remain about the crosslinguistic determinants of both options: the relation to agreement, to *pro*-drop, the differential availability of AE in object and

subject positions, potential overlaps between AE and Null Complement Anaphora, the status of null CPs etc. It is my hope that the understanding gained in the present study will foster research into these questions too.

Acknowledgements Earlier versions of this study have been presented at the linguistics colloquia of the Hebrew University of Jerusalem, the University of Geneva, the "You're on Mute!" ellipsis seminar organized by Gary Thoms at NYU and GLOW 45 at Queen Mary University of London. I am grateful to the audiences in all these venues for their helpful feedback, as well as to two anonymous NLLT reviewers. This research was supported by the Israel Science Foundation (grant No. 495/20).

Funding Israel Science Foundation Grant number 495/20.

References

Abe Jun. 2009. Identification of null arguments in Japanese. In *The dynamics of the language faculty: Perspectives from linguistics and cognitive neuroscience*, ed. Hiroto Hoshi, 135–162. Tokyo: Kuroshio Publishers.

Adger, David. 1994. Functional heads and interpretation. Ph.D diss., University of Edinburgh.

Aelbrecht, Lobke. 2010. *The syntactic licensing of ellipsis*. Amsterdam: John Benjamins.

Aelbrecht, Lobke, and William Harwood. 2015. To be or not to be elided: VP ellipsis revisited. *Lingua* 153: 66–97.

Ahn, Hee-Don, and Sungeun Cho. 2011. Notes on apparent DP ellipsis: A reply to Lee and Kim (2010). *Korean Journal of Linguistics* 36: 457–471.

Aoun, Joseph, and Yen-hui Audrey Li. 2008. Ellipsis and missing objects. In *Foundational isues in generative grammar*, eds. Robert Freidin, Carlos Peregrín Otero, and Maria Luisa Zubizarreta, 251–274. Cambridge, MA: MIT Press.

Bailyn, John F. 2017. Against a VP ellipsis account of Russian verb-stranding constructions. In *Studies in Japanese and Korean historical and theoretical linguistics and beyond: Festschrift presented to John B. Whitman*, eds. Alexander Vovin and William McClure. Vol. 16 of *Languages of Asia*, 93–109. Boston: Brill.

Baker, Mark. 2003. *Lexical categories: Verbs, nouns and adjectives*. Cambridge, UK: Cambridge University Press.

Baltin, Mark. 2012. Deletion versus pro-forms: An overly simple dichotomy? *Natural Language & Linguistic Theory* 30: 381–423.

Bentzen, Kristine, Jason Merchant, and Peter Svenonius. 2013. Deep properties of surface pronouns: Pronominal predicate anaphors in Norwegian and German. *The Journal of Comparative Germanic Linguistics* 16: 97–125.

Bošković, Željko. 2014. Now I'm a phase, now I'm not a phase: On the variability of phases with extraction and ellipsis. *Linguistic Inquiry* 45: 27–89.

Bošković, Željko. 2018. On pronouns, clitic doubling, and argument ellipsis: Argument ellipsis as predicate ellipsis. *English Linguistics* 35: 1–37.

Carlson, Gregory N. 1977. Reference to kinds in English. PhD diss., University of Massachusetts.

Cheng, Hsu-Te. 2013. Argument ellipsis, classifier phrases, and the DP parameter, PhD diss., University of Connecticut.

Chierchia, Gennaro. 1984. Topics in the syntax and semantics of infinitives and gerunds. PhD diss., University of Massachusetts, Amherst.

Chierchia, Gennaro. 1985. Formal semantics and the grammar of predication. *Linguistic Inquiry* 16: 417–443.

Chierchia, Gennaro. 1998. Reference to kinds across language. *Natural Language Semantics* 6: 339–405.

Chomsky, Noam. 1993. A Minimalist Program for linguistic theory. In *The view from building 20: Essays in linguistics in honor of Sylvain Bromberger*, eds. Ken Hale and Samuel Jay Keyser, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2004. Beyond explanatory adequacy. In *Structures and beyond: The cartography of syntactic structures (vol. 3)*, ed. Adriana Belletti, 10–131. Oxford: Oxford University Press.

Chomsky, Noam. 2008. On phases. In *In foundational issues in linguistic theory: Essays in honor of Jean-Roger Vergnaud*, eds. Robert Freidin, Carlos Peregrín Otero, and Maria Luisa Zubizarreta, 133–166. Cambridge, MA: MIT Press.

Chomsky, Noam. 2013. Problems of projection. *Lingua* 130: 33–49.

Chomsky, Noam. 2019. Some puzzling foundational issues: The reading program. *Catalan Journal of Linguistics, Special Issue: Generative Syntax. Questions, Crossroads, and Challenges*, 263–285.

Chomsky, Noam. 2020. The UCLA lectures. Ms., University of Arizona.

Chomsky, Noam, and Howard Lasnik. 1993. The theory of principles and parameters. In *Syntax: An International Handbook of Contemporary Research*, eds. Joachim Jacobs, Arnim von Stechow, Wofgang Sternefeld, and Theo Vennemann, 506–569. Berlin: Mouton de Gruyter.

Chung, Sandra, William A. Ladusaw, and James McCloskey. 1995. Sluicing and logical form. *Natural Language Semantics* 3: 239–282.

Constant, Noah. 2012. Witnessable quantifiers license type-e meaning: Evidence from contrastive topic, equatives and supplements. In *Proceedings of SALT 22*, ed. Anca Chereches, 286–306. Ithaca, NY: Cornell University.

Cyrino, Sonia. 2021. *On the syntax of null objects in Brazilian Portuguese. Handout of talk delivered at the conference Null Objects from a Crosslinguistic and Development Perspective*. Portugal: University of Minho. January 2021.

Cyrino, Sonia, and Ruth Lopes. 2016. Null objects and ellipsis in Brazilian Portuguese. *The Linguistic Review* 33: 483–502.

Cyrino, Sonia, and Gabriela Matos. 2006. Null complement Aanaphora in Romance: Deep or surface Anaphora? In *Romance Languages and Linguistic Theory 2004*, eds. Jenny Doetjes and Paz González, 95–120. Amsterdam/Philadelphia: John Benjamins.

Depiante, Marcela A. 2001. On null complement anaphora in Spanish and Italian. *Probus* 13: 193–221.

Doron, Edit. 1990. V-movement and VP-ellipsis. Ms., The Hebrew University of Jerusalem.

Doron, Edit. 1999. V-movement and VP-ellipsis. In *Fragments: Studies in ellipsis and gapping*, eds. Elabbas Benmamoun and Shalom Lappin, 124–140. Oxford: Oxford University Press.

Duguine, Maia. 2014. Argument ellipsis: A unitary approach to pro-drop. *The Linguistic Review* 3: 515–549.

Elbourne, Paul. 2005. The semantics of ellipsis. *Structure* 3: 63–109.

Epstein, Samuel D., Hisatsugu Kitahara, and Daniel T. Seely. 2012. Structure building that can't be. In *Ways of structure building*, eds. Myriam Uribe-Etxebarria and Vidal Valmala, 253–270. Oxford: Oxford University Press.

Fadlon, Julie, Julia Horvath, Tal Siloni, and Ken Wexler. 2018. The acquisition of Hebrew idioms: Stages, internal composition, and implications for storage. *Glossa* 3(1). Art. 99.

Fortin, Catherine R. 2011. We need LF-copying: A few good reasons why. In *Proceedings WCCFL 28*, eds. Mary B. Washburn, Katherine McKinney-Bock, Erika Varis, Ann Sawyer, and Barbara Tomaszewicz, 87–95. Somerville: Cascadilla Proceedings Project.

Fox, Danny. 1999. Reconstruction, binding theory and the interpretation of chains. *Linguistic Inquiry* 30: 157–196.

Fox, Danny. 2000. *Economy and semantic interpretation*. Cambridge, MA: MIT Press.

Fox, Danny. 2003. On logical form. In *Minimalist syntax*, ed. Randall Hendrick, 82–123. Oxford: Blackwell Publishers.

Francez, Itamar. 2006. Possessors, goals and the classification of ditransitive predicates: Evidence from Hebrew. In *Empirical issues in syntax and semantics 6*. eds. Olivier Bonami, and Patricia Cabredo Hofherr, 137–154. Paris: Presses Universitaires de Paris-Sorbonne.

Funakoshi, Kenshi. 2016. Verb-stranding Verb Phrase ellipsis in Japanese. *Journal of East Asian Linguistics* 25: 113–142.

Giannakidou, Anastasia, and Jason Merchant. 1997. On the interpretation of null indefinite objects in Greek. *Studies in Greek Linguistics* 17: 141–155.

Goldberg, Lotus M. 2005. Verb-stranding VP ellipsis: A cross-linguistic study. PhD diss., McGill University.

Gribanova, Vera. 2013. A new argument for verb-stranding Verb Phrase ellipsis. *Linguistic Inquiry* 44: 145–157.

Gribanova, Vera. 2020. Predicate formation and verb-stranding ellipsis in Uzbek. *Glossa* 5(1). Art. 124.

Grimshaw, Jane, and Armin Mester. 1988. Light verbs and theta-marking. *Linguistic Inquiry* 19: 205–232.

Han, Chung-hye, Kim Kyeong-min, Keir Koulton, and Jeffery Lidz. 2020. Null objects in Korean: Experimental evidence for the argument ellipsis analysis. *Linguistic Inquiry* 51: 319–340.

Harley, Heidi. 2007. One-replacement, unaccusativity, acategorial roots, and bare phrase structure. *Harvard Working Papers in Linguistics* 11: 637–678.
Hauser, Michael, Line Mikkelsen, and Maziar Toosanvardani. 2007. Verb Phrase pronominalization in Danish: Deep or surface anaphora? In *Proceedings of the 34 Western Conference on Linguistics*, eds. Erin Brainbridge and Brian Agbayani, 183–195. Fresno, CA: Department of Linguistics, California State University.
Heycock, Caroline. 1995. Asymmetries in reconstruction. *Linguistic Inquiry* 26: 547–570.
Huang, C.-T. James. 1982. Logical relations in Chinese and the theory of grammar. PhD diss., MIT.
Johnson, Kyle. 2001. What VP-ellipsis can do, and what it can't, but not why. In *The handbook of contemporary syntactic theory*, eds. Mark Baltin and Chris Collins, 439–479. Oxford: Blackwell Publishing.
Johnson, Kyle. 2019. Gapping and stripping. In *The Oxford handbook of ellipsis*, eds. Jeoren van Craenenbroeck and Tanja Temmerman, 562–604. Oxford: Oxford University Press.
Jung, Dukkyo. 2003. Complex predicates under the vP hypothesis. In *Proceedings of the Korean Society for Languge and Information Conference*, Vol. 06, 118–127.
Kayne, Richard S. 1984. *Connectedness and binary branching*. Dordrecht: Foris.
Kim, Soowon. 1999. Sloppy/strict identity, empty objects, and NP ellipsis. *Journal of East Asian Linguistics* 8: 255–284.
Kim, Young-Hoon. 2019. Syntactic constraints on argument ellipsis in Korean, Master thesis, Seoul National University.
Kratzer, Angelika. 2006. Decomposing attitude verbs. Handout of talk honoring Anita Mittwoch, The Hebrew University of Jerusalem.
Kurafuji, Takeo. 2019. A choice function approach to null arguments. *Linguistics and Philosophy* 42: 3–44.
Landau, Idan. 2018. Missing objects in Hebrew: Argument ellipsis, not VP ellipsis. *Glossa* 3(1): Art. 76, 1–37.
Landau, Idan. 2020a. On the non-existence of verb-stranding VP-ellipsis. *Linguistic Inquiry* 51: 341–365.
Landau, Idan. 2020b. Constraining head-stranding ellipsis. *Linguistic Inquiry* 51: 281–318.
Landau, Idan. 2021. Ellipsis with a coordinated antecedent: An alternative to V-stranding VP-ellipsis. *Studia Linguistica* 75: 1–23.
Landau, Idan. To appear. Type-restricted argument ellipsis and generalized quantifiers. *Linguistic Inquiry*.
Landman, Meredith. 2006. Variables in natural language. PhD diss., University of Massachusetts, Amherst.
Langland-Hassan, Peter, and Agustin Vicente, eds. 2018. *Inner speech: New voices*, Oxford: Oxford University Press.
Lee, Wooseung. 2014. Argumental gaps in Korean. *The Linguistic Association of Korea Journal* 1–29.
Lee, Wooseung. 2016. Argument ellipsis vs. V-stranding ellipsis in Korean: Evidence from disjunction. *Linguistic Research* 33: 1–20.
Leu, Thomas. 2007. These HERE demonstratives. *University of Pennsylvania Working Papers in Linguistics* 13: 141–154.
Li, Yen-Hui Audrery. 1990. *Order and constituency in Mandarin Chinese*. Dordrecht: Kluwer Academic.
Li, Yen-Hui Audrery. 2014. Born empty. *Lingua* 151: 43–68.
Liefke, Kristina, and Markus Werning. 2018. Evidence for single-type semantics. An alternative to *e*/*t*-based dual-type semantics. *Journal of Semantics* 35: 639–685.
Lipták, Anikó, and Güliz Güneş, eds. 2022. The derivational timing of ellipsis, Oxford: Oxford University Press.
Llombart-Huesca, Amàlia. 2002. Anaphoric one and NP-ellipsis. *Studia Linguistica* 56: 59–89.
Lobeck, Anne. 1995. *Ellipsis: Functional heads, licensing, and identification*. New York: Oxford University Press.
Lobeck, Anne. 1999. VP ellipsis and the Minimalist Program: Some speculations and proposals. In *Fragments: Studies in ellipsis and gapping*, eds. Shalom Lappin and Elabbas Benmamoun, 98–123. New York: Oxford University Press.
Maeda, Masako. 2019. Argument ellipsis and scope economy in Japanese. *Syntax* 22: 419–437.
Marušič, Franc, Petra Mišmaš, Vesna Plenič ar, and Tina Šuligoj. 2018. Surviving sluicing. In *Advances in Slavic linguistics 2016*, eds. Denisa Lenertová, Roland Meyer, Radek Šimík, and Luka Szucsich, 193–215. Berlin: Language Science Press.
Matushansky, Ora. 2008. On the linguistic complexity of proper names. *Linguistics and Philosophy* 21: 573–627.
May, Robert. 1977. The grammar of quantification. PhD diss., MIT.

Merchant, Jason. 2001. *The Syntax of silence: Sluicing, islands and the theory of ellipsis*. Oxford: Oxford University Press.
Merchant, Jason. 2004. Fragments and ellipsis. *Linguistics and Philosophy* 27: 661–738.
Merchant, Jason. 2018. Verb-stranding predicate ellipsis in Greek, implicit arguments, and ellipsis-internal focus. In *A reasonable way to proceed: Essays in honor of Jim McCloskey*, eds. Jason Merchant, Line Mikkelsen, Deniz Rudin, and Kelsei Sasaki, 229–270. Santa Cruz: University of Santa Cruz
Merchant, Jason. 2019. Ellipsis: A survey of analytical approaches. In *Handbook of ellipsis*, eds. Jeroen van Craenenbroeck and Tanja Temmerman, 19–45. Oxford: Oxford University Press.
Moltmann, Friedrike. 2013. *Abstract objects and the semantics of natural language*. Oxford: Oxford University Press.
Moulton, Keir. 2019. Adverbs in VP ellipsis: An experimental investigation of antecedent selection. *Canadian Journal of Linguistics* 64: 475–508.
Moulton, Keir. 2020. Remarks on propositional nominalization. In *Nominalizations: 50 years on from Chomsky's remarks*, eds. Hagit Borer and Artemis Alexiadou, 255–276. Oxford: Oxford University Press.
Murphy, Andrew. 2018. Surface properties of anaphoric *one*. Handout of talk delivered at LAGB Annual Meeting, University of Sheffield.
Ngonyani, Deo. 1996. VP ellipsis in Ndendeule and Swahili applicatives. In *Syntax at sunset (UCLA Working Papers in Linguistics)*, eds. Edward Garrett and Felicia Lee, 109–128. Lost Angeles: UCLA.
Nunberg, Geoffry, Ivan Sag, and Thomas Wasow. 1994. Idioms. *Language* 70: 491–538.
Nunes, Jairo. 2004. *Linearization of chains and sideward movement*. Cambridge, MA: MIT Press.
Ohtaka, Akane. 2021. A hybrid analysis of null argument constructions in Japanese. *University of Pennsylvania Working Papers in Linguistics* 27: 179–188.
Oku, Satoshi. 1998. A theory of selection and reconstruction in the Minimalist perspective. PhD diss., University of Connecticut.
Oku, Satoshi. 2016. A note on ellipsis-resistant constituents. *Nanzan Linguistics: Research Results and Activities* 11: 57–70.
Panitz, Ezekiel J. 2018. Argument ellipsis and strong Islands. PhD diss., University College London.
Park, Myung-Kwan. 1997. The syntax of VP ellipsis in Korean. *Language Research* 33: 629–648.
Partee, Barbara H. 1997. Genitives: A case study. In *Handbook of logic and language*, eds. Johan Van Benthem and Alice ter Meulen, 464–470. Amsterdam: Elsevier.
Poole, Ethan. 2017. Movement and the semantic type of traces. PhD diss., University of Massachusetts, Amherst.
Portelance, Eva. 2020. Genuine verb stranding vP-ellipsis in Lithuanian. In *Proceedings of NELS 50*, eds. Mariam Asatryan, Yixiao Song, and Ayana Whitmal, 59–72. Amherst: GLSA Publications.
Postal, Paul. 1969. Anaphoric Islands. In *Proceedings of CLS 5*, eds. Robert I. Binnick, Alice Davison, Georgia M. Green, and Jerry L. Morgan, 209–239. Chicago: Chicago University Press.
Postal, Paul. 1994. Contrasting extraction types. *Journal of Linguistics* 30: 159–186.
Potts, Christopher. 2002. The lexical semantics of parenthetical-*as* and appositive-*which*. *Syntax* 5: 55–88.
Quer, Josep, and Joana Rosseló. 2013. On sloppy readings, ellipsis and pronouns. In *Information structure and agreement*, eds. Camacha Taboada and Maria Victoria, 337–370. Amsterdam: John Benjamins.
Rasekhi, Vahideh. 2018. Ellipsis and information structure: Evidence from Persian. PhD diss., Stony Brook University.
Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, MA: MIT Press.
Romero, Maribel. 1998. Focus and reconstruction in the interpretation of Wh-phrases. PhD diss., University of Massachusetts, Amherst.
Ross, John R. 1969. Guess who. In *Proceedings of CLS 5*, eds. Robert I. Binnik, Alice Davidson, Georgia M. Green, and Jerry L. Morgan, 252–286. Chicago: Chicago University Press.
Runić, Jelena. 2014. A new look at clitics, clitic doubling, and argument ellipsis. PhD diss., University of Massachusetts, Amherst.
Saab, Andrès. 2022. Grammatical silences from syntax to morphology: A model for the timing of ellipsis. In *The derivational timing of ellipsis*, eds. Anikó Lipták and Güliz Günes, 170–224. Oxford: Oxford University Press.
Sag, Ivan. 1976. A note on Verb Phrase deletion. *Lingiuistic Inquiry* 7: 664–670.
Saito, Mamoru. 2007. Notes on East Asian argument ellipsis. *Language Research* 43: 203–227.
Saito, Mamoru. 2017. Ellipsis. In *Handbook of Japanese syntax*, eds. Masayoshi Shibatani, Shigeru Miyagawa, and Hisashi Noda, 701–750. Berlin: DeGruyter Mouton.

Saito, Mamoru, and Duk-Ho An. 2010. A comparative syntax of ellipsis in Japanese and Korean. In *Proceedings of the 6th Workshop on Altaic Formal linguistics (WAFL 6)*, eds. Hiroki Maezawa and Azusa Yokogoshi. MIT Working Papers in Linguistics, 287–307.
Sakamoto, Yuta. 2020. *Silently structured silent argument*. Amsterdam: John Benjamins.
Sato, Yosuke. 2014. Argument ellipsis in colloquial Singapore English and the anti-agreement hypothesis. *Journal of Linguistics* 50: 365–401.
Sato, Yosuke. 2015. Argument ellipsis in Javanese and voice agreement. *Studia Linguistica* 69: 58–85.
Sato, Yosuke. 2016. Remarks on the parameters of argument ellipsis: A new perspective from colloquial Singapore English. *Syntax* 19: 392–411.
Sato, Yosuke. 2019. Comparative syntax of argument ellipsis in languages without agreement: A case study with Mandarin Chinese. *Journal of Linguistics* 55: 643–669.
Sato, Yosuke. 2020. Idioms, argument ellipsis and LF-copy. *Journal of East Asian Linguistics* 29: 259–278.
Sato, Yosuke, and Simin Karimi. 2016. Subject-object asymmetries in Persian argument ellipsis and the anti-agreement theory. *Glossa* 1: 1–31.
Sauerland, Uli. 2004. The interpretation of traces. *Natural Language Semantics* 12: 63–127.
Schwarzchild, Roger. 2005. Measure phrases as modifiers of adjectives. *Recherches linguistiques de Vincennes* 34: 207–228.
Scontras, Gregory. 2014. The semantics of measurement. PhD diss., Harvard University.
Şener, Serkan, and Daiko Takahashi. 2010. Ellipsis of arguments in Japanese and Turkish. *Nanzan Linguistics* 6: 79–99.
Simpson, Andrew, Arumina Choudhury, and Mythili Menon. 2013. Argument ellipsis and the licensing of covert nominals in Bangla, Hindi and Malayalam. *Lingua* 134: 103–128.
Soh, Hooi Ling. 1998. Object scrambling in Chinese. PhD diss., MIT.
Sohn, Keun-Won. 2012. Apparent CP deletion and DP relatedness. *Linguistic Research* 29: 107–126.
Soltan, Usama. 2020. On null objects in Egyptian Arabic. *Brill's Journal of Afroasiatic Languages and Linguistics* 12: 204–259.
Sportiche, Dominique. 1995. French predicative clitics and clause structure. In *Small clauses: Syntax and semantics 28*, eds. Anna Cardinaletti and Maria Teresa Guasti, 287–324. New York: Academic Press.
Takahashi, Daiko. 2006. Apparent parasitic gaps and null arguments in Japanese. *Journal of East Asian Linguistics* 15: 1–35.
Takahashi, Daiko. 2008. Quantificational null objects and argument ellipsis. *Linguistic Inquiry* 39: 307–326.
Takahashi, Daiko. 2013. Argument ellipsis in Japanese and Malayalam. *Nanzan Linguistics* 9: 173–192.
Takahashi, Daiko. 2014. Argument ellipsis, anti-agreement and scrambling. In *Japanese syntax in comparative perspective*, ed. Mamuro Saito, 88–116. Oxford: Oxford University Press.
Takahashi, Daiko. 2020. Derivational argument ellipsis. *The Linguistic Review* 37: 47–74.
Takahashi, Shoichi, and Danny Fox. 2005. MaxElide and the re-binding problem. In *Proceedings of SALT 15*, eds. Effi Georgala and Jonathan Howell, 223–240. Ithaca: CLC Publications.
Takano, Yuji. 1995. Predicate fronting and internal subjects. *Linguistic Inquiry* 26: 327–340.
Tancredi, Christopher. 1992. Deletion, deaccenting and presupposition. PhD diss., MIT.
Temmerman, Tanja. 2019. When the sluice is not alone: On the syntax of WH+non-WH sluicing in Dutch. Presentation at the Sluicing and Ellipsis at 50 conference, University of Chicago.
Tomioka, Satoshi. 2003. The semantics of Japanese null pronouns and its cross-linguistic implications. In *The interfaces: Deriving and interpreting omitted structures*, eds. Kerstin Schwabe and Susanne Winkler, 321–339. Amsterdam: John Benjamins.
Tomioka, Satoshi. 2014. Remarks on missing arguments in Japanese. In *Proceedings of FAJL 7*, eds. Shigeto Kawahara and Mika Igarashi, 251–264. Cambridge: MIT Press.
van Craenenbroeck, Jeroen. 2010. *The syntax of ellipsis: Evidence from Dutch dialects*. New York: Oxford University Press.
Vikner, Carl, and Per Anker Jensen. 2002. A semantic analysis of the English genitive. Interaction of lexical and formal semantics. *Studia Linguistica* 56: 191–226.
Ward, Gregory, Richard Sproat, and Gail McKoon. 1991. A pragmatic analysis of so-called anaphoric Islands. *Language* 67: 439–474.
Wasow, Thomas. 1972. Anaphoric relations in English. PhD diss., MIT.
Williams, Edwin. 1977. Discourse and logical form. *Lingiuistic Inquiry* 8: 101–139.
Winter, Yoad. 2005. Cross-categorial restrictions on measure phrase modification. *Linguistics and Philosophy* 28: 233–267.

Wurmbrand, Susi. 2017. Stripping and topless complements. *Linguisic Inquiry* 48: 341–366.
Yoshimura, Noriko. 1992. Scrambling and anaphora in Japanese. PhD diss., University of Southern California.