Argument Externality

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1. Introduction

This paper investigates the notion of *external argument* in contemporary syntactic theory. Note that the notion "subject" is not of primary concern here; rather, the relevant distinction is the one identified by Belletti and Rizzi (1981), Burzio (1986), and Perlmutter (1978), among others—namely, the subjects of transitive verbs and unergative verbs (*external* arguments; i.e., underived subjects), vs. the subjects of unaccusative verbs and verbal passives (*internal* arguments; i.e., derived subjects). Specifically, I consider the distribution of *argument externality*—in other words, the formal problem of determining, based on a given thematic grid, which (if any) of the arguments will be mapped externally (i.e., as an underived subject).

Intuitively, this problem might seem to have a rather straightforward solution. Accounting for binding and constituency among arguments in the same derivation requires a mechanism that determines hierarchy among the different arguments merged in a particular derivation. This need is independent of the internal argument vs. external argument distinction, since such binding/constituency effects exist even among the two internal arguments of ditransitive verbs (see Aoun and Li 1989, Larson 1988, Pesetsky 1995, among others). Given that such a hierarchy is independently needed, one might try to define *external argument* as the highest argument on this hierarchy. The existence of unaccusative verbs complicates things slightly, but one might refine this approach in terms of *highest on the argument hierarchy, to the exclusion of* Patient, Theme, *etc.*, or some other refinement along similar lines. However, as section §2 will show, such a mechanism (though independently necessary to account for binding/constituency, as mentioned earlier) cannot produce the correct results for *argument externality*, the formal problem described at the outset.

This paper will have little to say about the system that generates the aforementioned hierarchy (other than to show that the hierarchy alone cannot account for the distribution of argument externality); I refer the reader to Levin and Rappaport-Hovav (2005) for a detailed treatment

of this and related issues. Instead, I will show that the distribution of argument externality cannot be adequately accounted for without reference to Case-assignment (i.e., instead of viewing Case-assignment as a reflex of argument externality, taking Case-assignment to be a factor that determines argument externality). I will propose a mechanism that derives the distribution of argument externality conjunctively from properties of Case and of the thematic role assigned to a given argument.

Crucially, it will be shown that the distinctions made by this conjunctive formulation correlate quite reliably with a seemingly independent property—namely, whether or not the given argument is an island for extraction when located in its base-position. This correlation suggests a particular implementation of the aforementioned mechanism, in terms of the type of syntactic merger that attaches the argument at its base-position.

The paper is organized as follows. Section §2 examines the Object-/Subject-Experiencer alternation, and the behavior of the arguments of these verbs with respect to various internal/external-argument diagnostics. The emergent argument-mapping facts are subjected to analysis using several major theoretical frameworks, all of which fall short of making the correct predictions.

Section §3 starts by suggesting a novel typology of arguments, grounded in their mapping possibilities across different constructions. This typology is shown to coincide with a seemingly unrelated fact, namely whether or not a given argument constitutes an island before undergoing movement (i.e., when it is still at its base-position). It is then proposed that the thematic role assigned to a given argument determines the type of merger employed in introducing the argument into the derivation—regular *set-merge* (as in Chomsky 2004), or island-inducing merger. The interaction of the type of merger with VP-internal Case assignment is what determines what we consider to be *internal* vs. *external* mapping; the latter is thus nothing more than an epiphenomenon. A specific way of deriving the relevant distinction between arguments (or rather, between thematic roles) is then presented, based on Reinhart's (2000, 2002) proposal for featural composition of thematic roles. This section concludes with a brief discussion of what this implies

about the system of Case assignment within the verb-phrase, and situates the issue within the wider problem of how the subject is chosen from among multiple verbal arguments, even when they are all "internal".

In section §5, I show that the island-inducing merger mentioned above may be none other than *pair-merge* (Chomsky 2004)—the same type of merger that introduces adjuncts. The fact that adjuncts exhibit properties not exhibited by the arguments hypothesized here to undergo *pair-merge* (most notably, so-called "Lebeaux-effects"; Lebeaux 1988, 1998) can be accounted for within the late-merger approach (Fox and Nissenbaum, 1999, Fox 2002, Lebeaux 1998), and need not be traced to properties of *pair-merge* itself.

Section §6 reviews the change that this proposal entails in the theoretical landscape of *set-merge*, *pair-merge*, and the Conceptual-Intentional (C-I) interface, and concludes that the resulting state of affairs is no more and no less stipulative than the conventional view. The added empirical coverage should thus tip the scales in favor of the current proposal.

Section §7 surveys the prospects for eliminating *internal argument* and *external argument* as primitives altogether, and reformulating principles that refer to these primitives in terms of merger and Case, as discussed here.

Section §8 is the conclusion.

2. The Externality Puzzle

The linguistics literature of the past three decades is rife with accounts implicating the *internal* argument vs. *external* argument distinction, dating at least as far back as Williams' (1981) seminal paper on argument-structure.

It is therefore both surprising and worrisome that, as will be shown below, there is no adequate account in place for the distribution of argument externality. In other words, linguistic theory lacks a mechanism that given a thematic grid will consistently predict which if any of its arguments will be mapped externally (i.e., as an underived subject)—though there obviously exist subsets of this

problem for which there is a simple account (e.g., grids that include an AGENT role will always map their AGENT argument externally).

2.1. The Experiencer Paradigm

2.1.1. The Object-/Subject-Experiencer Alternation

One of the cases that are left unaccounted for in current theoretical frameworks is the case of argument-mapping in the Object-/Subject-Experiencer paradigm. Consider the following, well-studied alternation:

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

(2) a. The children worried (that Dan was smoking).

b. ha-yeladim da'agu (ʃe-Dan me'aʃen). (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

The EXPERIENCER arguments in Object-Experiencer derivations (1) are *internal*, whereas the EXPERIENCER arguments in Subject-Experiencer derivations (2) are *external* (i.e., underived subjects). This will be demonstrated below using external argument diagnostics.

At this point, a note on productivity is in order. As noted by Reinhart (2001, 2002), Object-/Subject-Experiencer alternations such as (1–2) are rare in English, restricted to a very small set of verbs; the passive form is more commonly used to express meanings analogous to (2) in English. Compare (1a) and (2a) above, involving *worry*, with (3a) and (4a), involving *annoy* (in particular, note the ungrammaticality of (4a), vs. the grammaticality of (2a)). However, as pointed out by Reinhart (2002), this seems to be an idiosyncrasy of the English language. In other languages

(e.g., Dutch, French, Italian, Hebrew), the alternation is available for many EXPERIENCER-selecting verbs. As an example, consider the Hebrew verb *'icben/hit'acben* ('annoy') in (3b) and (4b) (in particular, note that (4b) is grammatical, on par with (2b)).

(3) a. It annoyed the children that Dan was smoking.

b. 'icben et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
annoyed ACC the-children that-Dan smoking
'It annoyed the children that Dan was smoking.'

(4) a. * The children annoyed (that Dan was smoking).

b. ha-yeladim hit'acbenu (ʃe-Dan me'aʃen). (Hebrew)
the-children annoyed that-Dan smoking
'The children were annoyed (that Dan was smoking).'

Also noteworthy, is that while English fails to mark this alternation morphologically, Hebrew distinguishes between the two forms. Object-Experiencer derivations such as (1b) and (3b), in which the EXPERIENCER argument surfaces as the direct object of the verb, are possible only with forms like *hid'ig/'icben*. In contrast, Subject-Experiencer derivations such as (2b) and (4b), in which the EXPERIENCER argument surfaces as the subject, are possible only with forms like *da'ag(u)/hit'acben(u)*.[1] Therefore, Hebrew can be used to apply external argument diagnostics to each of the derivations, while maintaining certainty about which of the two variants is being tested.

2.1.2. Applying Mapping Diagnostics to the Experiencer Paradigm

The default word order in Hebrew is SV(O). As shown by Reinhart and Siloni (2005) and Shlonsky (1987), the verb can precede the subject in one of two cases: *triggered* inversion, in which some clause-initial XP licenses the inverse order (i.e., [XP verb subject]), or *simple* (or *untriggered*)

[1]Though the intricacies of Hebrew morpho-phonology may obscure the morphological relatedness to a certain degree, the Object-Experiencer forms in (1b) and in (3b) and the Subject-Experiencer forms in (2b) and in (4b) are indeed derived from common roots: both *hid'ig* (1b) and *da'ag(u)* (2b) are derived from the consonantal base *d-'-g*; both *'icben* (3b) and *hit'acben* (4b) are derived from the consonantal base *'-c-b-n*.

inversion, in which nothing precedes the verb (i.e., [verb subject]). Simple inversion is possible only when the subject is underlyingly an internal argument. Thus, verbal passives (5a) and unaccusatives (5b) allow it, while unergatives (5c) do not:[2]

(5) a. putru ʃloʃa morim. (Hebrew)
fired.PASV three teachers
'Three teachers were fired.'

b. higi'u ʃloʃa necigim.
arrived three representatives
'Three representatives arrived.'

c. * rakdu ʃloʃa yeladim.
danced three children

Recall (1–2), repeated below:

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

(2) a. The children worried (that Dan was smoking).

b. ha-yeladim da'agu (ʃe-Dan me'aʃen). (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

[2] The data regarding untriggered inversion in transitive constructions (i.e., [verb subject object]) is indecisive, and therefore omitted here.

As shown below, the Subject-Experiencer verb in (2b) (*da'agu* 'worried') patterns with the unergative in (5c)—it does not allow simple inversion, indicating that its EXPERIENCER argument is external (i.e., an underived subject):[3]

(6) * da'agu ʃloʃa studentim (ʃe-ha-more me'aʃen). (Hebrew)
worried three students that-the-teacher smoking

Another diagnostic for argument externality in Hebrew is modification by a possessive dative constituent. As noted by Borer and Grodzinsky (1986), a full DP (i.e., not a pronoun or clitic) marked with dative Case can serve as the possessor for the subject only if the subject is underlyingly an internal argument. Consequently, the dative noun-phrase can serve as the possessor for the subjects of verbal passives (7a) and unaccusatives (7b), but not for the subjects of unergatives (7c) or the subjects of transitives (7d):[4]

(7) a. le-mi butal ha-ʃi'ur? (Hebrew)
DAT-who cancelled.PASV the-lesson
'Whose lesson was cancelled?'

b. le-mi niʃbera ha-kos?
DAT-who broke the-glass
'Whose glass broke?'

c. * le-mi axlu ha-'orxim?
DAT-who ate the-guests

[3] Though the behavior of two-place predicates with respect to untriggered inversion is unclear (see fn. 2), the sentence in (6) is ungrammatical even with the clausal argument omitted. Compare this with the non-inverted case, which is perfectly grammatical even without the clausal argument:

(i) ʃloʃa studentim da'agu (Hebrew)
three students worried
'Three students worried.'

[4] As can be seen in (7), the wh-element *mi* 'who' behaves as a full DP for these purposes; wh-questions have been used to avoid any confounds which might arise from the surface position of the dative possessor: if a question is formed in which the dative possessor itself is the wh-element, it will invariably surface clause-initially.

d. # le-mi he'exilu makarim et ha-yetomim?
DAT-who fed acquaintances ACC the-orphans
'#Whose orphans did acquaintances feed?'/
'*Whose acquaintances fed the orphans?'[5]

As shown below, the Subject-Experiencer verb in (2b) (*da'agu* 'worried') patterns with the unergative in (7c)—the dative constituent cannot be the possessor of the EXPERIENCER argument, indicating once again that the EXPERIENCER argument is external (i.e., an underived subject):

(8) * le-mi da'ag ha-student (me-ha-macav)? (Hebrew)
DAT-who worried the-student from-the-situation

The picture that emerges is therefore that in the Subject-Experiencer case (in (2)), the EXPERIENCER argument is an external argument (i.e., an underived subject).

I will now examine the Object-Experiencer case (in (1)), turning first to the THEME/SUBJECT-MATTER argument—i.e., the clausal argument, exemplified by *that Dan was smoking*.[6]

First, it may seem that cases such as (1a), repeated below, constitute a case of clausal extraposition:

(1) a. It worried the children that Dan was smoking.

This approach would take the derivation of (1a) to be something like (9), below:

[5] In (7d), the direct object *yetomim* ('orphans') is used to preclude attributing the possessor to the direct object (recall that the possessive dative is meant to diagnose the status of the subject). Since the subject in (7d) is an external argument (i.e., an underived subject), it fails to be interpreted as the possessee of *le-mi* ('DAT-who'), leaving only the option of the direct object *ha-yetomim* ('the-orphans') being interpreted as the possessee—an option which is odd, given our world-knowledge about what it means to be an orphan.

[6] The thematic role assigned to this argument has been argued to differ from THEME, hence the label SUBJECT-MATTER (Pesetsky 1995, Reinhart 2001, 2002). In particular, it is argued that while THEME arguments can freely co-occur with CAUSER arguments, SUBJECT-MATTER arguments cannot (Reinhart 2001, 2002, accounts for this in terms of *Cluster Distinctness*, a restriction on co-occurrence of particular thematic feature clusters). However, the distinction between the two will not prove crucial for the current analysis; all that is relevant is that this thematic role is the same in (1) as it is in (2) (see §2.2.3).

(9) [That Dan was smoking] worried the children.

→ It_i worried the children [that Dan was smoking]$_i$.

As first observed by Wexler and Culicover (1977, 1980), clausal extraposition of this type causes the extraposed clause to become an island for extraction (the *Freezing Principle*; Wexler and Culicover 1977, 1980), as exemplified below:

(10) a. Dan revealed [that he hated *Barriers*] to the class.

→ Dan revealed it_i to the class [that he hated *Barriers*].

b. * What_1 did Dan reveal it to the class [that he hated t_1]?

Crucially, the case in (1a) does not share this behavior—namely, it allows extraction from within the embedded clause:

(11) What_1 did it worry the children [that Dan was reading t_1]?

At the very least, this shows that there exists a derivation of (1a) in which the embedded clause is not an underlying subject of the predicate *worry* which has undergone extraposition, but rather a bona fide internal argument of *worry*.

Another diagnostic, used by Reinhart (2001), involves so-called "backward anaphora":

(12) a. ?? [His_i doctor] visited [every patient]$_i$.

b. [His_i health] worried [every patient]$_i$.

(Reinhart 2001, (34a-b), p. 16)

The marginality of (12a) (under the bound-variable reading) is a standard case of Weak-Crossover. Following Reinhart (2001), what salvages (12b) is that the Theme/Subject-Matter argument (*his health*) is an internal argument (i.e., a derived subject). As an internal argument, *his health* is base-generated in a position that is c-commanded by *every patient*, and can reconstruct to that position

to receive its bound-variable interpretation at LF. Given that there is a possibility for *his health* to receive a bound-variable interpretation without recourse to QR of *every patient*, one would expect the bound-variable reading of (12b) to be free of Weak-Crossover effects, as is indeed the case.

In contrast, no such possibility exists for (12a): the noun-phrase *his doctor* is a CAUSER, and is therefore an underived subject (see §3.1). It therefore has no available reconstruction site that is c-commanded by *every patient*; the only way to achieve a bound-variable reading for *his doctor* in (12a) is by QR of *every patient*, giving rise to the attested Weak-Crossover effect.

We can therefore safely conclude that in the Object-Experiencer case (in (1)), the THEME/SUBJECT-MATTER argument is internal (i.e., a derived subject). As for the post-verbal accusative-marked EXPERIENCER argument in (1), it is internal as well. Its accusative marking may be taken as sufficient evidence of this—but the same can be shown using the possessive dative diagnostic (along the lines of (7–8)):

(13) le-mi hid'ig ha-macav et ha-yeladim? (Hebrew)
DAT-who worried the-situation ACC the-children
'Whose children did the situation worry?'

The felicity of the possessive dative construction indicates that the possessed argument (in this case, the EXPERIENCER argument *ha-yeladim* 'the children') is indeed an internal argument (i.e., a derived subject).

To recapitulate, the facts regarding the mapping of arguments in the Object-/Subject-Experiencer paradigm are summarized below:

(14) a. Object-Experiencer derivation: (1a–b)

(i) EXPERIENCER argument mapped internally

(ii) EXPERIENCER argument is assigned accusative Case

(iii) in cases such as (1a–b), where the THEME/SUBJECT-MATTER is realized as a clause (and the subject is a non-thematic *it* in English (1a), or empty in Hebrew (1b)), there is no external argument whatsoever

b. Subject-Experiencer derivation: (2a–b)

(i) EXPERIENCER argument mapped externally

(ii) EXPERIENCER argument is not assigned accusative, but nominative Case

In the next section, I will show that these mapping facts defy explanation using existing theoretical approaches.

2.2. Possible Accounts

2.2.1. Externalization

There exist derivational processes—such as adjectival-passive formation—that can "externalize" an argument (i.e., turn what was originally an internal argument of a predicate into an external argument of the derived predicate). Crucially, however, externalization is typically associated with the change of lexical category. The derivational relation between the verbs in (1) and in (2) does not change their lexical category; both remain verbs.

Furthermore, the exact relation between the verbs is the same as in the so-called "causative"/"anti-causative" alternation—namely, the presence vs. absence of a CAUSER argument on the thematic grid. Even the morphology exhibited by the Hebrew examples in (1b) and in (2b) is typical of the "causative"/"anti-causative" alternation in Hebrew.

Thus, assuming that externalization is involved in the alternation between (1) and (2) would be completely ad-hoc; it would be nothing more than a description of the facts to be explained.

2.2.2. Little-*v* and Other Functional Heads

In recent linguistic literature, it has become common practice to assume a functional layer above the lexical verb-phrase, and below the Tense projection, consisting of one or more functional projections: *v*P, VoiceP, PredP, and TrP are some examples (Bowers 1993, Chomsky 1995b, Collins 1997, Kratzer 1996). These accounts assume that the external argument of the verb is introduced by one of these functional heads.

The pertinent question, however, is how the Computational System knows which, if any, of the thematic arguments should be introduced by such a functional head (as opposed to being introduced by the lexical verb itself). A common response is that the functional head is responsible for introducing AGENT and CAUSER arguments, while the lexical verb introduces all other arguments.

Obviously, such an account would predict that EXPERIENCER arguments would never be external (i.e., they could only be derived subjects)—a prediction which is clearly false (see §2.1.2). Similarly, adding EXPERIENCER to AGENT and CAUSER as one of the roles introduced within the functional layer, would predict that EXPERIENCER arguments would always be external—a prediction which is also false (again, see §2.1.2).

Finally, one could argue that EXPERIENCER arguments can indeed be introduced by some functional layer dominating the lexical verb (and thus be mapped externally, as an underived subject), but only under specific circumstances. One possibility is that a functional head (e.g., v^0) selects the EXPERIENCER argument if and only if no other potential subject (e.g., an AGENT or a CAUSER) is present. However, note that neither an AGENT nor a CAUSER is present in either of the derivations under consideration (namely, (1) and (2))—and yet the mapping facts regarding the EXPERIENCER arguments contrast.[7]

[7] Horvath and Siloni (2002) argue that severing the external argument from the lexical verb is untenable, because of a related but separate issue: the fact that certain derivational relations between verbs in the lexicon exhibit a dependency on the external thematic role, and therefore the external role must be part of the thematic grid which is specified on the lexical verb itself.

Another alternative is to appeal to a selectional restriction to prevent the relevant functional head from selecting Object-Experiencer verbs (whose EXPERIENCER argument has been shown to be internal). Such a move would provide little in the way of explanation, however: the locus of decision making, regarding the external/internal status of the EXPERIENCER argument, would simply shift to wherever the grammar specifies the selectional properties of this functional head, and no insight would be gained as to why the selectional facts happen to be this way—in other words, what the relevant difference between Object-Experiencers and Subject-Experiencers is, such that they give rise to a different selectional pattern with respect to the aforementioned functional head.[8]

2.2.3. Thematic Hierarchies

Consider the possibility of accounting for the data in §2.1 in terms of a thematic hierarchy—leaving open at this point what the particular relevant thematic hierarchy might end up being.

Recall (1–2), repeated below:

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

(2) a. The children worried (that Dan was smoking).

b. ha-yeladim da'agu (ʃe-Dan me'aʃen). (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

The issue of psych-verbs and their thematic roles is a much-studied and much-debated issue in linguistic theory (see Belletti and Rizzi 1988, Pesetsky 1995, Reinhart 2001, 2002, and others). The

[8] In contrast, the proposal in §3–§5 ties the different mapping of the EXPERIENCER argument in Object-Experiencers and Subject-Experiencers to an independently attested property of the predicates in question: the ability of Object-Experiencer verbs to assign accusative Case, vs. the inability of Subject-Experiencer verbs to do so.

claim I wish to make here is far more trivial than those made in the aforementioned literature: that the thematic roles assigned to *the children* and to *that Dan was smoking* are the same in (1) as they are in (2).

Obviously, this is not a claim that would go unchallenged in contemporary linguistics. Some would take the different syntactic mapping of *the children* in each case (as demonstrated in §2.1.2) to be evidence—in and of itself—of a different thematic role being assigned to either *the children* or *that Dan was smoking*. One would be hard pressed, however, to explain such a change in the thematic grid, given the derivational relation between the verbs in (1) and in (2) (a relation which is morphologically manifested in the Hebrew examples, (1b) and (2b)).

Moreover, unless the alleged difference in thematic roles is shown to affect some independent grammatical property (one that cannot be reduced to the different syntactic mapping of the relevant argument in each case), it becomes nothing more than an alternative way of saying "internally-mapped EXPERIENCER" and "externally-mapped EXPERIENCER", or "THEME/SUBJECT-MATTER when EXPERIENCER is internal" and "THEME/SUBJECT-MATTER when EXPERIENCER is external".[9]

Let us therefore adopt the null hypothesis that *the children* and *that Dan was smoking* are assigned the same thematic roles in (1) as they are in (2).

If the set of thematic roles in each case is the same, whatever status a specific thematic hierarchy assigns to the EXPERIENCER argument in (1), will be assigned to the EXPERIENCER in (2) as well—thus failing to explain the divergent mapping facts which were demonstrated in §2.1.2.

This is independent of whether thematic hierarchies operate "from above" (starting with the highest-ranked role) or "from below" (starting from the lowest ranked role). The derivations in (1) and (2) have precisely the same thematic arguments—an EXPERIENCER and a THEME/SUBJECT-

[9] In fact, such a correlation to an independent grammatical fact may not be sufficient, either—unless it is demonstrated that this grammatical fact is in principle more likely to be a result of the alleged thematic difference than to simply co-vary with syntactic mapping. To put this another way, if one argues for the existence of separate thematic roles, θ[x] and θ[x'], one should provide a diagnostic for when a given argument is a θ[x] and when it is a θ[x']. This diagnostic should be independent from the phenomenon this distinction was put forth to explain, and moreover, it should make sense as a diagnostic for thematic differences in the first place.

MATTER; neither of the verbs examined in the derivations in (1–2) assigns a thematic role which is not assigned by the other. Thus, thematic hierarchies cannot differentiate the two.

A potential objection to this has to do with the thematic grid of Object-Experiencer verbs. As argued by Pesetsky (1995), these verbs are actually three-place predicates, selecting a CAUSER, an EXPERIENCER, and a THEME/SUBJECT-MATTER. One may therefore argue that the presence of the CAUSER role on the verb's thematic grid—present on the grid of Object-Experiencer verbs such as (1), but absent on Subject-Experiencer verbs such as (2)—is responsible for the different mapping of the EXPERIENCER argument in each case.

Notice, however, that a CAUSER argument is crucially absent from the derivation itself, even in the Object-Experiencer derivations in (1) (as shown by Pesetsky 1995, exactly one of the two roles CAUSER and THEME/SUBJECT-MATTER can be syntactically realized in a given derivation). The only way the non-realized role could affect the mapping of the EXPERIENCER argument, is if the derivation were to consult the verb's thematic grid upon the merger of the EXPERIENCER, to make sure it was indeed the highest thematic role on the verb's grid, in terms of the relevant thematic hierarchy.

Nevertheless, such an approach can be falsified outright, by considering a certain sub-class of manner-verbs:

(15) a. Dan cut the bread (with the knife).

b. Dan xatax et ha-lexem (im ha-sakin). (Hebrew)
Dan cut ACC the-bread with the-knife
'Dan cut the bread (with the knife).'

(16) a. The knife cut the bread.

b. ha-sakin xatax et ha-lexem. (Hebrew)
the-knife cut ACC the-bread
'The knife cut the bread.'

As shown in (15), verbs such as cut can have an AGENT as their subject. However, in the absence of an AGENT, an INSTRUMENT can surface as their subject. Crucially, the INSTRUMENT in (16) is not only a subject, but in fact an external argument (i.e., an underived subject). This can be demonstrated in Hebrew by the failure of the possessive dative test (see §2.1.2 for a description of this diagnostic):[10]

(17) a. ha-sakin xatax et ha-lexem ʃel Dan. (Hebrew)
the-knife cut ACC the-bread of Dan
'The knife cut Dan's bread.'

b. # le-mi xatax ha-sakin et ha-lexem ʃel Dan?
DAT-who cut the-knife ACC the-bread of Dan

Note also that it is not a case that verbs like *xatax* 'cut' select a CAUSER-type argument, which can be realized as any AGENT, CAUSER, or INSTRUMENT. Evidence to this effect comes from two independent sources. First, the two arguments (AGENT and INSTRUMENT) can be realized together—a completely unexpected result if these were two realizations of the same thematic role. This is the case even in languages that Case-mark the INSTRUMENT as such—e.g., Russian—making it fairly certain that it is indeed an argument (and not an adjunct):[11]

[10] Recall that to be considered "successful", the possessive dative constituent must be interpreted as the possessor of the argument being tested (in this case, the INSTRUMENT). To disambiguate, an explicit possessor was added to the THEME argument (*ha-lexem ʃel Dan* 'the-bread of Dan').

[11] The status of the parenthesized PP in the English and Hebrew examples in (15a–b) is less obvious. There are some facts suggesting it is an adjunct:

(i) a. ? (The police report stated that) Dina cut him$_i$ [with Dan's$_i$ (own) knife].
b. * (The police report stated that) Dina sent him$_i$ [to Dan's$_i$ (own) doctor].

A seemingly contradictory fact is that such *with*-PPs allow extraction:

(ii) What$_1$ did (the police report state that) Dina cut Dan [with t$_1$]?

However, this seems to hold even in cases where one can be fairly certain that the *with*-PP is an adjunct:

(iii) What$_1$ did Dan break the window [with t$_1$]?

This suggests that there is a problem here in our understanding of extraction from non-obligatory material in the verb-phrase, that cuts across the argument/adjunct distinction.

(18) a. Ivan otrezal verevku nozhnicami. (Russian)
Ivan.NOM cut string.ACC scissors.INSTR
'Ivan cut the string with the scissors.'

b. Ivan chistil jabloko nozhom.
Ivan.NOM peeled apple.ACC knife.INSTR
'Ivan peeled the apple with the knife.'

Second, realizing a causer that is neither an AGENT nor an INSTRUMENT is impossible for verbs like *xatax* 'cut'. In contrast, it is perfectly acceptable for verbs selecting a true unspecified CAUSER, such as *ʃavar* 'break' (Reinhart 2002):

(19) a. Dan/the key/the pressure opened the door.

b. Dan/the knife/*the weight cut the rope.

(20) a. Dan/ha-mafteax/ha-laxac patax et ha-delet. (Hebrew)
Dan/the-key/the-pressure opened ACC the-door
'Dan/the key/the pressure opened the door.'

b. Dan/ha-sakin/*ha-miʃkal xatax et ha-xevel.
Dan/the-knife/*the-weight cut ACC the-rope
'Dan/the knife/*the weight cut the rope.'

Finally, note that it is not the case that the verbs in (15) and the verbs in (16) represent different thematic frames (on par with, say, "anti-causatives" vs. "causatives"). While this is difficult to discern in a zero-morphology language such as English, a derived entry lacking an AGENT role would invariably receive morphological marking in Hebrew. The verb in (16b)—*xatax* ('cut')—shows no such morphological marking; it is identical to the verb in (15b).

Compare this state of affairs with the EXPERIENCER derivations under discussion. If, upon merger of a given argument, the derivation were to consult the verb's thematic grid to check for

higher-ranked roles (even ones which were not realized in the current derivation), the presence of an AGENT role on the thematic grid of *cut* should have precluded the external mapping of the INSTRUMENT in (16), contrary to fact.

We can therefore be quite certain that what precludes the external mapping of the EXPERIENCER argument in (1) is not the presence of a CAUSER role on the verb's thematic grid.

To recapitulate, consider the following lexical representations:

(21) a.

worry / *hid'ig*:

θ_{CAUSER}	$\theta_{\text{EXPERIENCER}}$	$\theta_{\text{SUBJECT-MATTER}}$

(i) CAUSER and EXPERIENCER realized →

EXPERIENCER is internal argument

(ii) EXPERIENCER and SUBJECT-MATTER realized →

EXPERIENCER is internal argument

b.

worry / *da'ag*:

$\theta_{\text{EXPERIENCER}}$	$\theta_{\text{SUBJECT-MATTER}}$

EXPERIENCER and SUBJECT-MATTER realized →

EXPERIENCER is external argument (i.e., underived subject)

c.

cut / *xatax*:

θ_{AGENT}	θ_{THEME}	$\theta_{\text{INSTRUMENT}}$

(i) AGENT, THEME and INSTRUMENT realized →

INSTRUMENT is internal argument

(ii) THEME and INSTRUMENT realized →

INSTRUMENT is external argument (i.e., underived subject)

The derivations in (1) and in (2) are represented above in (21a-ii) and in (21b), respectively. The set of thematic roles realized in each of the two cases is the same, yet the EXPERIENCER argument is internal in one and external in the other (as shown in §2.1.2).

This cannot be accounted for by appealing to the presence of an unrealized high-ranking role on the thematic grid of (1) (represented above in (21a-ii)), because this would make the wrong prediction for manner-verbs in derivations such as (16), represented above in (21c-ii).

Thus, thematic hierarchies cannot in any way account for the mapping facts in §2.1. Of course, this is not to say that thematic hierarchies have no place in the mapping of argument-structure to syntactic representation; one place where it is likely that they do is in accounting for binding and constituency effects among multiple arguments merged in the same derivation (independently of the internal argument vs. external argument issue), as discussed in the INTRODUCTION.

2.2.4. Burzio's Generalization

Burzio's generalization (Burzio 1981, Chomsky 1981) states that if a verb has accusative Case, it necessarily has an external argument (i.e., an underived subject). The generalization can also be stated negatively: a verb lacking an external argument will not bear accusative Case. Other versions of Burzio's Generalization reject a bi-conditional formulation, opting for a unidirectional implication from the existence of an external argument to the presence of accusative Case, or vice-versa.

The alternation in (1–2), repeated below, is one of many examples in the literature which do not conform to Burzio's generalization:[12]

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

(2) a. The children worried (that Dan was smoking).

[12] The existence of such cases can be taken as strong evidence against positing a functional projection that rolls into one both the external thematic role and accusative Case—namely the little-*v*P projection—thereby strengthening Horvath and Siloni's (2002) position against the existence of such a projection. See fn. 7.

b. ha-yeladim da'agu (ʃe-Dan me'aʃen). (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

The verbs in (1) lack external arguments (see §2.1.2) but bear accusative Case (overtly manifested in the Hebrew (1b)). The verbs in (2) have external arguments (again, see §2.1.2), but lack accusative Case. Thus, an approach that associates externality with the presence of accusative Case, while capturing an important linguistic tendency, will fail to account for the facts above. Even unidirectional versions of Burzio's generalization will fail with respect to (1–2), since (1b) contradicts the implication from accusative Case to the existence of an external argument, and (2b) contradicts the implication from the existence of an external argument to the presence of accusative Case.

2.2.5. Reinhart's *Theta System*

In Reinhart's (2002) *Theta System*, arguments are given syntactic mapping based on thematic information and derivational relations between lexical entries. Arguments such as Agent and Causer are assigned external status, arguments such as Goal, Theme, and Subject-Matter are assigned internal status, and arguments such as Experiencer and Instrument are given *default* status.[13] Arguments with *default* status are mapped externally, except in the presence of another argument explicitly marked as external (presumably, due to the singularity of the subject position).

It follows that Experiencer arguments will be mapped externally unless an Agent/Causer-type argument is present in the derivation. In Object-Experiencer derivations, such an argument can be absent (see (1), above). Crucially, this does not result in the Experiencer argument being mapped externally (see §2.1.2). As demonstrated in §2.2.3, an approach whereby it is the presence of a syntactically-unrealized Causer role on the verb's thematic grid that precludes external mapping of the Experiencer argument is untenable.

[13] These lists are not stipulated by Reinhart (2002), but rather derived on the basis of featural composition of thematic roles; see §3.5.

Therefore, the divergent mapping of the EXPERIENCER argument in the Object-Experiencer and Subject-Experiencer derivations in (1–2), both of which lack an AGENT/CAUSER argument, poses a problem for the *Theta System* (as Reinhart herself was well aware; see Reinhart 2001).

3. Deconstructing Externality

As demonstrated in section §2, all existing accounts for the distribution of argument externality fail with respect to the Object-/Subject-Experiencer paradigm. This suggests two major possibilities. The first is that our understanding of argument externality is lacking; that further research will uncover properties of external arguments that are currently unknown, leading to an improved account of their distribution. A second option is that there really is no such thing as an "external argument"; that the notion is a conflation of separate primitives, and its distribution is difficult to predict because it does not constitute a natural class.

Below, I will explore the latter option: that "external argument" has no formal status in the grammar. It is in fact an epiphenomenon, and conflates two better-motivated and independently necessary primitives: merger and Case.

Notice that if this is on the right track, it means that any account that assumes external arguments (i.e., underived subjects) are systematically introduced by a separate functional head is necessarily mistaken—as there is no such thing as "external argument". However, let us suspend such judgment at this point, and simply examine whether pursuing this possibility fares better with respect to the empirical challenge presented in section §2.

3.1. A Mapping-Based Typology of Arguments

There are many typologies of verbal arguments, along many axes and relating to various aspects of form and meaning (see, for example, Levin and Rappaport-Hovav 2005). In what follows, I propose a typology of arguments in terms of the mapping properties they exhibit—namely, whether they can be mapped as external or internal, and under which conditions.

Given this point of view, three classes of verbal arguments emerge:

(22) a. A-arguments:

Arguments that are always mapped externally (i.e., as underived subjects). These include AGENT and CAUSER arguments.

b. B-arguments:

Arguments that are sometimes mapped externally (i.e., as underived subjects), and sometimes mapped internally. These include, at the very least, EXPERIENCER arguments, and probably also INSTRUMENT arguments.

c. C-arguments:

Arguments that are always mapped internally. These include at least GOAL, SOURCE, and SUBJECT-MATTER, and possibly also THEME arguments.[14]

3.2. Conditions on Mapping

Since the distribution of A-arguments and C-arguments is each uniform, let us examine the conditions that govern the mapping of B-arguments. Recall (1–2), repeated below:

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

(2) a. The children worried (that Dan was smoking).

b. ha-yeladim da'agu (ʃe-Dan me'aʃen). (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

[14] The complicating factor with respect to THEME arguments is the existence of so-called "emission verbs" (also known as Theme-unergatives), which are one-place verbs which appear to select a THEME argument, but map this argument externally (i.e., as an underived subject; see Horvath and Siloni 2002, Levin and Rappaport-Hovav 2005, Reinhart 2002).

However, it is not uncontroversial that the role assigned by these verbs is indeed THEME.

As can be seen overtly in (1b), the marking of the EXPERIENCER argument with accusative Case correlates with internal mapping of the argument, whereas the absence of accusative Case marking, as in (2b), correlates with external mapping.

It is commonly assumed that accusative Case is restricted to arguments within the verb-phrase.[15] Such an explanation would conceive of the accusative marking in (1b) as being facilitated by the internal mapping of the EXPERIENCER argument. Yet, the same correlation could be just as easily the result of causation in the opposite direction. Consider the possibility that the internal mapping of the EXPERIENCER in (1b) is the result of accusative Case marking; and conversely, that the external mapping in (2b) is the result of the lack of accusative Case marking.

This would mean that the mapping of B-arguments (which are sometimes mapped externally and sometimes internally) is somehow determined by Case assignment. A first approximation would look like this:

(23) B-arguments are mapped externally (i.e., as underived subjects) **iff** they do not check accusative Case

In fact, it seems that the property in (23) has to do with VP-internal Case in general, and not only with accusative Case; to the extent that the bracketed arguments below are also EXPERIENCER arguments, they are mapped internally by virtue of checking VP-internal Case that is not accusative:

(24) a. It seems [to Dina] that Dan will be late.

b. The political process does not appeal [to some people].

Let us then modify (23) so that in encompasses these cases as well:[16]

[15] Cf. Sigurdsson (2006), who argues against such a restriction.

[16] What exactly counts as VP-internal Case, and how the computational system knows what counts as such, is an interesting and valid question. Let us adopt the working hypothesis that this is purely a structural term—namely, Cases that can be assigned to a noun-phrase without that noun-phrase having to move out of the VP (though movement within the verb-phrase is not excluded). See §3.6 for more discussion.

(25) B-arguments are mapped externally (i.e., as underived subjects) **iff** they do not check Case VP-internally

Consider now A-arguments—those arguments that are never mapped internally (e.g. AGENT and CAUSER). Since these never check Case inside the VP, the generalization can be expanded as follows:

(26) A/B-arguments are mapped externally (i.e., as underived subjects) **iff** they do not check Case VP-internally

(Of course, (26) circumvents the issue of why A-arguments never check Case VP-internally, while B-arguments sometimes do. See §3.6 for related discussion.)

At this point, it is not clear what advantage the formulation in (26) has over the one in (25). However, notice that the formulation in (26) actually partitions verbal arguments into two (and not three) groups:

(27) a. A/B-arguments:
Mapped externally (i.e., as underived subjects) **iff** they do not check Case VP-internally

b. C-arguments:
Never mapped externally (i.e., can only be derived subjects)

Crucially, the groups defined in (27a–b) form natural classes with respect to another, seemingly unrelated phenomenon, which will be discussed in the following section.

3.3. Extraction at the Base Position

It has been well-documented that in many languages, extraction from subjects is impossible (Chomsky 1986, Huang 1982, Kayne 1984). Obviously, different arguments can end up in subject position, under different circumstances. However, under the likely assumption that the Subject Condition is a property of a position, and not an intrinsic property of constituents occupying that

position, the Subject Condition might sometimes mask a separate phenomenon—the blocking of extraction (or lack thereof) by arguments at their base-positions.[17]

To clarify, consider the following rather trivial alternation:

(28) a. It surprised Dina [that Dan enjoyed rock music].
b. [That Dan enjoyed rock music] surprised Dina.

(29) a. [Which music]$_1$ did it surprise Dina [that Dan enjoyed t_1]?
b. * [Which music]$_2$ did [that Dan enjoyed t_2]$_1$ surprise Dina t_1?

If one were to look exclusively at (28b) and (29b), one might incorrectly conclude that the clausal argument of *surprise* has the property of blocking extraction. As shown in (29a), this is hardly so.

However, unlike the clausal argument of *surprise* in (28–29), there do exist arguments that cannot be extracted from, regardless of their syntactic mapping—i.e., even when they are mapped as "internal" arguments. Consider the following cases:

(30) a. [Which students]$_1$ did the counselor meet [teachers of t_1]?
b. * [Which students]$_1$ did the situation worry [teachers of t_1]?
(from Johnson 1992—via Landau to appear—with modifications)[18]

(31) a. [Iz kakogo universiteta]$_1$ vy priglasili [studentov t_1]? (Russian)
from which university you.PL invited students
'Which university did you invite the students of?'
b. * [Iz kakogo universiteta]$_1$ novosti vzvolnovali [gostej t_1]?
from which university news worried visitors

[17] Here and throughout, *base-position* is taken to mean the structural position in which an element has undergone *External-Merge*—i.e., the point at which it was first introduced into the derivation from the numeration.

[18] Johnson (1992) (via Landau to appear), states that this behavior only holds for EXPERIENCER arguments when the subject of the clause has a non-agentive reading. My own consultants, both in English and in Russian, attest otherwise.

(32) * [Which students]$_1$ did [teachers of t_1] worry about the situation?

The Experiencer arguments in (30b) and in (31b) cannot be extracted from, despite being mapped internally. Of course, Experiencer arguments that are mapped externally surface as subjects, and consequently, their "intrinsic" islandhood cannot be straightforwardly diagnosed; it is therefore unclear whether the ungrammaticality of (32) is a result of base-position islandhood, or rather simply the result of the Subject Condition. Nevertheless, it seems unlikely that extraction at the base-position would be allowed by externally-mapped Experiencer arguments—without this ever being manifested—all the while being blocked by internally-mapped Experiencer arguments.

The same behavior appears to hold for Instrument arguments—at least in those languages where one can be certain that the Instrument is indeed a thematic argument, as opposed to being an unselected verbal modifier (an adjunct). Once again, Russian—which Case-marks the Instrument as such—can serve us here:[19]

(33) a. ? [Iz kakogo magazina]$_1$ Ivan poterjal [nozh t_1]? (Russian)
from which store Ivan lost knife.acc
'[Which store]$_1$ did Ivan lose [the knife from t_1]?'

b. * [Iz kakogo magazina]$_1$ Ivan chistil jabloko [nozhom t_1]?
from which store Ivan peeled apple.acc knife.instr

We can therefore conclude that Experiencer arguments and Instrument arguments—categorized as B-arguments in §3.1—do indeed constitute islands at their base-positions, even when they are mapped internally.

What is the behavior of A-arguments and C-arguments with respect to this property? We have already seen one type of C-argument in action—the Theme/Subject-Matter argument of *surprise*

[19] I avoid here discussing the argument/adjunct status of *with*-PPs, when they appear with manner-verbs in English and Hebrew. See fn. 11.

in (28–29) was shown to allow extraction at its base-position. GOAL and SOURCE arguments seem to behave the same way:[20]

(34) a. [Which building]$_1$ were the shots fired [from the roof of]?

b. [Which town]$_1$ were the horsemen approaching [the outskirts of t_1]?

c. [Which candidate]$_1$ did you send money [to representatives of t_1]?

d. [Which castle]$_1$ did the horsemen leave [the confines of t_1]?

As for A-arguments, they are uniformly mapped externally (i.e., as underived subjects), and their base-position islandhood is thus consistently confounded by the Subject Condition. To test extractability at the base-position, one would have to find constructions in the languages in question in which an A-argument was arguably still in situ in its base-position.

Italian *ne*-cliticization may be precisely such a case. As shown in (36), subjects (both derived and underived) can appear post-verbally in Italian:

(35) a. Arriveranno molti esperti. (Italian)
arrive.FUT many experts
'Many experts will arrive.'

b. Telefoneranno molti esperti. (Italian)
telephone.FUT many experts
'Many experts will telephone.'

(data from Burzio 1986)

Belletti and Rizzi (1981), Burzio (1986), and Cinque (1990) discuss the behavior of the *ne* clitic, which replaces the nominal complement of the quantifier (e.g., *molti* 'many') in Italian. As Cinque puts it, *ne*-cliticization is possible only from "structural objects"—including direct (but not oblique) objects, and post-verbal subjects of passives, unaccusatives, and impersonal *si* constructions.

[20] Hebrew is not used here, because it prohibits extraction from non-predicative noun-phrases, and GOAL and SOURCE are seldom clausal.

Consider the contrast between the applicability of *ne*-cliticization to the post-verbal subject of an unaccusative verb (*arriveranno* 'arrive.FUT', in (36a)), and its inapplicability to the post-verbal subject of an unergative verb (*telefoneranno* 'telephone.FUT', in (36b)):

(36) a. Ne_1 arriveranno [molti t_1]. (Italian)
NE(of-them) arrive.FUT many
'Many of them will arrive.'

b. * Ne_1 telefoneranno [molti t_1].
NE(of-them) telephone.FUT many
(data from Burzio 1986)

The obvious difference between (36a) and (36b) is the thematic role assigned to the post-verbal subject: in (36a) it is THEME, while in (36b) it is AGENT. It is of course not inconceivable that the syntactic structures of (36a) and (36b) differ (though it is surely not the null-hypothesis). Regardless, however, given any sort of verb-phrase-internal base-position for the subject, it is not sufficient to assume that properties of the (final) subject position are what renders (36b) ungrammatical; extraction from the argument's base-position must also be addressed (and is presumably responsible for the contrast in (36a–b)). The ungrammaticality of (36b) can therefore be taken to support the conjecture that A-arguments do indeed block extraction at their base-position.

Further support comes from German phrase splitting. As shown in (37), German allows phrases to be linearly discontinuous:

(37) a. Er hat immer [dreckige Kleider] an. (German)
he has always dirty clothes on
'He always has dirty clothes on.'

b. Kleider$_1$ hat er immer [dreckige t_1] an.
clothes has he always dirty on
'As for clothes, he always has dirty ones on.'
(from Alexiadou et al. 2004)

As shown by Grewendorf (1989), subjects in general are not impermeable to such phrase splitting. In particular, subjects of unaccusative verbs can be split:

(38) a. Fehler$_1$ sind dem Hans [vermeidbare t_1] unterlaufen. (German)
mistakes are the Hans avoidable occurred
'As for mistakes, avoidable ones have happened to Hans.'
b. Widersprüche sind dem Richter [mehrere t_1] aufgefallen.
inconsistencies are the judge many stricken
'As for inconsistencies, many of them have stricken the judge.'
(from Alexiadou et al. 2004)

However, subjects of transitive verbs (as in (39a)) or unergative verbs (as in (39b)) cannot be split in this way:

(39) a. * Studenten haben [fleißige t_1] das Seminar besucht. (German)
students have hard-working the seminar visited
b. * Studenten haben [fleißige t_1] telefoniert.
students have hard-working called
(from Alexiadou et al. 2004)

Once again, it is conceivable that the position of the arguments in question is different in the case of (39a–b) than it is in the case of (38a–b). Crucially, however, it is not the case that any argument which ends up in subject position constitutes an island for extraction—as evinced by the

grammaticality of (38a–b). Thus, to account for the ungrammaticality of (39a–b), extraction from the base-position of these arguments must be blocked as well.

The pattern is thus quite similar to the one observed for Italian *ne*-cliticization: a movement operation is able to escape subjects in general—but not subjects which are assigned thematic roles such as AGENT (as is assigned to *fleißige studenten* 'hard-working students' in (39a–b)).

Thus, as far as islandhood at the base-position is concerned, A-arguments (i.e., arguments that are always mapped externally) can be tentatively grouped with B-arguments (arguments whose mapping varies). The generalization can then be organized along the same lines used in §3.2:

(40) a. A/B-arguments: (e.g., AGENT, CAUSER, EXPERIENCER, INSTRUMENT)
Cannot be extracted from at their base-positions

b. C-arguments: (e.g., GOAL, SOURCE)
Allow extraction at their base-positions

Putting the generalizations in (40) together with their counterparts from §3.2, one arrives at the following formulation:

(41) a. A/B-arguments:
(i) Mapped externally (i.e., as underived subjects) **iff** they do not check Case VP-internally
(ii) Cannot be extracted from at their base-positions

b. C-arguments:
(i) Never mapped externally (i.e., can only be derived subjects)
(ii) Allow extraction at their base-positions

It is these generalizations that form the basis for the proposal that follows.

3.4. Proposal: Theta-Driven Merger

As outlined in (41), the mapping properties of verbal arguments split them along similar lines as does islandhood at their base-position. The latter property seems especially puzzling, since given the assumptions of minimalist syntax, there appears no way to capture it: arguments are presumably introduced by *set-merge* (Chomsky 2004), and there is no phase boundary separating the verb from its arguments. No part of familiar minimalist machinery would therefore explain the blocking of extraction from arguments with specific thematic roles, regardless of their internal/external mapping.

We are of course familiar with the phenomenon of islandhood at the base-position from the realm of adjuncts. Adjunction is performed through the operation of *pair-merge* (Chomsky 2004), which prevents the computational system from probing into the adjoined element (this is not, of course, the only property that Chomsky associates with *pair-merge*; another is the blindness of Binding Theory to nodes merged via this operation).

How could the phenomenon of A/B-arguments blocking extraction at their base-position be captured, then?

Let us first consider what one might call a "structural" account. Under this approach, what sets A/B-arguments apart would not be a property of their merger per se, but rather a property of the position in which they were merged. For instance, the specifier of little-*v*P (if such a projection is assumed) may have some special property blocking extraction from within it. Notice, however, that this cannot be taken to be a general property of specifiers:

(42) a. Who$_1$ did you give [a picture of t_1] to Dan?

b. Who$_1$ did you give a picture [to acquaintances of t_1]?

(from Landau 1994, with modifications)

Given any phrase structure that obeys *Binary Branching* (Kayne 1994), the derivation of both (42a) and (42b) will have at most one true complement position to afford an argument of *give*.[21] This means that at least one of the two internal arguments of *give* is in a specifier position—both in (42a) and in (42b)—yet allows extraction.

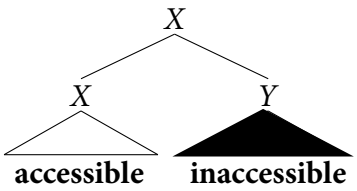
Thus, a "structural" account of the base-position islandhood of A/B-arguments will have to posit something particular to *v*P that prevents extraction from its specifier. Yet this cannot end here: as shown in §3.3, Experiencer and Instrument arguments (B-arguments) also constitute islands at their base-position, even when the verb-phrase includes a separate Agent argument. Therefore, one would have to assume that Experiencer and Instrument arguments are introduced by a separate functional head (or two), just to capture the base-position islandhood property. At this point, it is quite clear that the endeavor of providing a "structural" account is reduced to encoding the empirical phenomenon to be captured directly into the syntactic structure, and thus constitutes little more than an alternative way to describe the facts themselves.

An alternative would be that the merger operation itself, which introduces A/B-arguments into the derivation, creates a domain that is inaccessible to extraction. There are two options here: one is to assume that there is a third type of merge, call it *set-merge'*, which is like *set-merge* in every way except it prevents higher heads from probing into its terms. Narrow-syntax, however, already has a type of merger with this property, namely *pair-merge*. Could *pair-merge* be responsible for merging A/B-arguments into syntax? This would immediately raise other questions, involving properties of adjuncts other than base-position islandhood (e.g., "invisibility" for certain aspects of Binding Theory)—properties that are not shared by A/B-arguments.

Let us put this issue aside for now, simply referring to the relevant operation as *opaque-merge*, returning to its precise "identity" later (see section §5). The operation *opaque-merge* will be construed as the merger of two syntactic objects X and Y into a new syntactic object, such that material dominated by the non-projecting node is no longer accessible for further computation:

[21] I use the term "true complement" to denote a node from which a path to C^0 exists, such that this path crosses only nodes of complementation. Obviously, even given *Binary Branching*, adjunction can introduce a complex constituent that contains further complement nodes. However, none of these will qualify as true complements, given this definition.

(43) *opaque-merge*:



Note that the projecting/non-projecting asymmetry manifested in (43) replicates what is found in the domain of adjunction: a modifier adjoined (i.e., *pair-merged*) to a projection of X^0 does not preclude extraction from within other constituents of XP (as in (45)), only from within the modifier itself (as in (44)):

(44) * Who$_1$ did Dan drink [$_{\textit{merged}}^{\textit{set-}}$ five cups of coffee] [$_{\textit{merged}}^{\textit{pair-}}$ before he met with t_1]?

(45) What$_1$ did Dan drink [$_{\textit{merged}}^{\textit{set-}}$ five cups of t_1] [$_{\textit{merged}}^{\textit{pair-}}$ before he met with Dina]?

The state of affairs with respect to *opaque-merge* is arguably the same:

(46) * Who$_1$ did it annoy [$_{\textit{merged}}^{\textit{opaque-}}$ supporters of t_1] [$_{\textit{merged}}^{\textit{set-}}$ that Dan mentioned the time]?

(47) What$_1$ did it annoy [$_{\textit{merged}}^{\textit{opaque-}}$ supporters of Dina] [$_{\textit{merged}}^{\textit{set-}}$ that Dan mentioned t_1]?

The bracketed argument in (46) is an Experiencer, and hence a B-argument. It therefore blocks extraction from within it. However, this does not preclude independent extraction from within the same VP, as shown (47).

Note also that movement of the entire *Y* node is not excluded by this formulation, and this seems empirically correct:

(48) [Supporters of whom]$_1$ did it annoy t_1 that Dan mentioned the time?

Once again, this is on par with adjunction:

(49) [After which meal]$_1$ were we promised a glorious dessert would be served t_1?

Returning to the generalizations in (41), they can be recast in terms of *opaque-merge*, yielding the following:

(50) a. A/B-arguments:
   (i) Introduced into the derivation via *opaque-merge*
   (ii) Mapped externally (i.e., as underived subjects) **iff** they do not check Case VP-internally

b. C-arguments:
   (i) Introduced into the derivation via *set-merge*
   (ii) Never mapped externally (i.e., can only be derived subjects)

It is clear what an external argument would be, in these terms:

(51) "External" argument:

An *opaque-merged* argument that has not checked Case VP-internally

The claim here is twofold. First, that (51) is precisely the mechanism which was shown to be missing in §2.2—a reliable predictor of the syntactic mapping (external vs. internal) of a given argument. Second, that given (51), there is no need to have a formal notion of *external argument*; principles implicating external arguments or internal arguments can be subsumed under exactly these properties of merger and Case (hence the quotation marks around "external").

To evaluate the first claim, one must elaborate the details of (51) more precisely. This will be done in the remainder of section §3. The second claim will be discussed in section §7.

The first step in making the proposal more precise is to explicitly state the set of thematic roles that will be merged via *opaque-merge*—in other words, exactly which arguments are A/B-arguments. In §3.1–§3.3, some examples were given. These are repeated below, now framed in terms of the *set-merge*/*opaque-merge* distinction:

(52) a. *set-merged* roles: GOAL, SOURCE, SUBJECT-MATTER, THEME[22]

b. *opaque-merged* roles: AGENT, CAUSER, EXPERIENCER, INSTRUMENT

These obviously constitute only a small subset of the thematic roles argued for in linguistic literature. However, the list in (52) is at the same time quite exhaustive, in that these thematic roles are what one might consider the "core" roles—the set of rather uncontroversial roles used most commonly in linguistic analysis. In §3.5, I will present a possibility for deriving this listing from a common property of the roles involved in (52a).

3.5. Deriving the Thematic Sets

As it stands in (52), we have for each type of merger, a list of thematic roles that will undergo that type of merger. This is obviously not a particularly attractive state of affairs. One would hope that we could derive these lists somehow, or perhaps derive one of them and have the other represent the "elsewhere" condition.

This sub-section presents a particular proposal for deriving the lists in (52). Note, however, that nothing in the current account is contingent on accepting this particular method of deriving them. One could derive (52) some other way, with no repercussions on the rest of the proposal; and one could even seek to extend the lists in (52a–b) to include additional thematic roles, in which case an alternative to the forthcoming account would be mandatory.

In her account of the *Theta System*, Reinhart (2000, 2002) argues that thematic roles are not grammatical primitives, but rather conventionalized labels for feature clusters. The features underlying the set of thematic roles are:

(53) a. $\pm c$: whether or not the argument in question is necessarily responsible for causing change in the context of the denoted event

b. $\pm m$: whether or not the mental state of the the argument in question is relevant to the denoted event

[22] For a caveat involving the THEME role, see fn. 14.

Each of these features can be valued for [+] or for [−], or left unvalued, giving a total of 8 non-empty combinations:[23]

(54)

	$+m$	$\varnothing$	$-m$
$+c$	AGENT	CAUSER	INSTRUMENT
$\varnothing$	SENTIENT	$\varnothing$	SUBJECT-MATTER
$-c$	EXPERIENCER	GOAL / SOURCE	THEME

The uninitiated reader may find the distinction between [$\varnothing$] and [−] on features in (54) to be surprising. To understand the difference, consider for example the distinctions on the first row, along the horizontal ([$+m$]/[$\varnothing$]/[$-m$]) dimension: an AGENT's mental state is necessarily relevant to the denoted event; an INSTRUMENT's mental state is necessarily irrelevant to the denoted event (if at all existent); a CAUSER is underspecified in this regard. In some instances, a CAUSER may cause change inadvertently—in which case its mental state is irrelevant (and it may be "recast" as an Instrument). In other cases, however, it may cause change deliberately—in which case its mental state is relevant (and it may be "recast" as an Agent). The point is that there are predicates that select precisely such an underspecified CAUSER argument (e.g., (19a) and (20a), in §2.2.3).

The state of affairs along the vertical ([$+c$]/[$\varnothing$]/[$-c$]) dimension is analogous.

Given this topography of thematic roles, the set of thematic roles in (52a) (the roles that, by hypothesis, undergo *set-merge* at their base-positions) constitutes a natural class: THEME ([$-c-m$]), SUBJECT-MATTER ([$-m$]), and GOAL/SOURCE ([$-c$]), which can be characterized as feature clusters containing only [−] values.[24]

[23] On a potential interpretation for the empty cluster, see Marelj (2004). SUBJECT-MATTER here refers to what is sometimes called the "Theme" of Experiencer-verbs (see Pesetsky 1995, Reinhart 2001). SENTIENT, according to Reinhart (2002), is the thematic role assigned to the subjects of verbs like *love*, *know*, and *believe*.

[24] The observation that this is a significant natural class is due to Reinhart (2002) herself, and plays a central role in the mapping algorithm of the *Theta System*, which this proposal is meant to subsume. For a discussion of some disadvantages of that algorithm, see §2.2.5.

The type of merger employed in merging a new argument to the verb would then be sensitive not to the specific thematic role assigned to the argument, but only to whether or not that role was specified for a [+] value with respect to any of its features.

3.6. Remarks on VP-Internal Case Assignment

A crucial ingredient in the proposal in §3.4 was that what we consider to be external arguments (i.e., underived subjects) are necessarily arguments which have not checked Case within the VP. This was formalized as part of (51), repeated below:

(51) "External" argument:

An *opaque-merged* argument that has not checked Case VP-internally

Since external arguments are by definition a subset of surface subjects, this claim might seem trivial. However, recall that this proposal reverses the perspective on the causal relation between Case and externality: the latter becomes a result of the former (see §3.2). Articulating the conditions on VP-internal Case-checking thus becomes crucial.

Still, it warrants mentioning that this problem had not been truly trivial even before the aforementioned reversal of perspective. If argument externality were taken to be the primitive, and the notion subject were defined as "the external argument, if present", one would still need a clause in the definition of *subject* to deal with constructions that lack an external argument altogether (i.e., passives, unaccusatives, and raising predicates). This may seem straightforward for one-place unaccusatives, or for verbal passivization of two-place predicates—but there exist two-place unaccusatives as well: *belong*, *appeal*, *elude*, *occur*, *lack*, *miss*, *suffice* (Pesetsky 1995).

Thus, in a sentence such as (55) below, even the "standard" Case/externality theory (which takes VP-internal Case assignment to be contingent on internal mapping of the argument) would require a more elaborate theory for which of the arguments will check Case within the VP, and which will have to move to [Spec,TP] and become the subject:

(55) [The robbers]$_1$ eluded [the detectives] t_1.

In (55), both arguments are internal (Pesetsky 1995). Therefore, there needs to be some principle which accounts for the fact that it is the *eludee* (i.e., [*the detectives*]) which is assigned Case VP-internally, leaving the *eluder* (i.e., [*the robbers*]) to move to [Spec,TP] and be assigned nominative Case. Developing such a theory is beyond the scope of this paper (but see Alexiadou and Anagnostopoulou, 2001, 2007, for a related discussion). I will point out some considerations that come to bear on this problem.

The obvious temptation is to make Case assignment, at least of the VP-internal variety, dependent on theta assignment. In other words, to have the Case that is assigned to an argument of the verb, if that argument stays inside the verb-phrase, depend upon the thematic role assigned to that argument. Obviously, though, not all instances of Case assignment conform to this pattern—hence the traditional bifurcation of Case into "inherent" Case vs. "structural" Case.

The most obvious example of Case behaving "structurally" is probably that of ECM constructions. In these, Case is assigned within the VP to a DP that is unrelated to that VP; it need not be an argument of any V(P) at all (i.e., it could be an expletive). Therefore, the most progress one could hope to make in this direction would be to argue that if an argument remains within the domain of the verb that gave it its thematic role, its Case will be dependent on that role.

In any event, there is a need for an articulated theory for the mechanics of Case within the verb-phrase, and specifically, for how Case assignment is determined when the arguments outnumber the VP-internal Case assigners—which, given Alexiadou and Anagnostopoulou's (2001, 2007) *Subject-in-Situ Generalization*, is always the case.

Data like (55) show that the need for a general theory of VP-internal Case-assignment extends beyond issues of *internal* vs. *external* mapping of arguments: the problem also arises in cases of "multiply-unaccusative" predicates (e.g., *elude*). Since the scope of such a theory necessarily extends beyond that of the current proposal (as data like (55) demonstrate), I will forgo a more detailed investigation if this issue here.

4. Sample Derivations

In this subsection, I will demonstrate the workings of the proposal with respect to several sample derivations, involving the transitive and intransitive alternates of two verbs—*break* and *worry*—as well as a manner-verb of the kind discussed in §2.2.3—namely, *cut*.

Consider first the derivation of transitive *break*—as in (56), below:

(56) [John]$^{\text{Causer}}$ broke [the window]$^{\text{Theme}}$.

The Causer argument in (56) (i.e., *John*) undergoes *opaque-merge* at its base-position—following (52), repeated below:

(52) a. *set-merged* roles: Goal, Source, Subject-Matter, Theme

b. *opaque-merged* roles: Agent, Causer, Experiencer, Instrument

The only available VP-internal Case in (56) (presumably, accusative Case) is not assigned to *John*. Therefore, given the definition in (51) (repeated below), *John* is predicted to surface as an external argument.

(51) "External" argument:

An *opaque-merged* argument that has not checked Case VP-internally

The Theme argument *the window* undergoes *set-merge* at its base-position (following (52)), and will therefore be mapped as an internal argument, regardless of Case-assignment (following (51)).

Both of these mapping predictions are in accordance with the well-documented state of affairs for transitive *break*.

Consider next the derivation of intransitive *break*—as in (57), below:

(57) [The window]$_1^{\text{Theme}}$ broke t_1.

In (57), the Case-assignment on *the window* has changed; instead of accusative (as in (56)), which is a VP-internal Case, *the window* in (57) is assigned nominative. However, this change in Case-marking does not alter the mapping of the argument (following (51)), since *the window* is not *opaque-merged* (it is *set-merged*, since it is a Theme; see (52)). The Theme is therefore predicted to still be an internal argument—again, in accordance with the well-observed state of affairs in English.

Consider next the derivation of intransitive *worry*—as in (58), below:

(58) [The children]$^{\text{Exper.}}$ worried ([that Dan was smoking]$^{\text{Theme/S.-M.}}$). (=(2a))

The Experiencer argument *the children* undergoes *opaque-merge* in its base-position (following (52)). Since it is not assigned VP-internal Case, *the children* is predicted to be mapped as an external argument (following (51))—in accordance with the facts shown in §2.1.

The Theme/Subject-Matter argument *that Dan was smoking* undergoes *set-merge* in its base-position (following (52)), and is therefore predicted to be an internal argument, regardless of Case-assignment (following (51))—again, in accordance with the facts shown in §2.1.

Consider next the derivation of transitive *worry* with an expletive subject—as in (59), below:

(59) It worried [the children]$^{\text{Exper.}}$ [that Dan was smoking]$^{\text{Theme/S.-M.}}$. (=(1a))

In (59), the Case-assignment on *the children* has changed; instead of nominative (as in (58)), *the children* is assigned accusative, a VP-internal Case. Since *the children* is an *opaque-merged* argument (following (52)), this changes the prediction regarding *the children* to being mapped as an internal argument (following (51)). Again, this is in accordance with the facts shown in §2.1.

Consider next the derivation of transitive *worry* with a causer subject, instead of a clausal Theme/Subject-Matter argument—as in (60), below:

(60) [John]$^{\text{Causer}}$ worried [the children]$^{\text{Exper.}}$.

As in (56), above, the CAUSER argument *John* undergoes *opaque-merge* at its base-position (following (52)). Since *John* is not assigned VP-internal Case, the prediction is that *John* will be mapped as an external argument (following (51)). This is also in accordance with the attested behavior of the CAUSER in Subject-Experiencer derivations (see Pesetsky 1995).

Consider next the derivation of *cut*, when an AGENT and THEME are selected:

(61) [John]$^{\text{AGENT}}$ cut [the bread]$^{\text{THEME}}$.

As before, the AGENT argument *John*—which is *opaque-merged*, following (52), and not assigned VP-internal Case—is predicted to be mapped as an external argument. The THEME argument *the bread*—which is *set-merged*, following (52)—is predicted to be mapped as an internal argument.

English cannot accommodate both an AGENT argument and an INSTRUMENT argument, in terms of the inventory of available Case-markings. Therefore, in derivations where both are selected, the INSTRUMENT must surface in a prepositional phrase:

(62) [John]$^{\text{AGENT}}$ cut [the bread]$^{\text{THEME}}$ [with [the knife]$^{\text{INSTR.}}$].

Contrast this with Russian, in which both an AGENT and an INSTRUMENT argument can be realized in the same derivation without resorting to a prepositional phrase, due to the availability of the instrumental Case-marking (as in (18a), repeated below):

(18) a. [Ivan]$^{\text{AGENT}}$ otrezal [verevku]$^{\text{THEME}}$ [nozhnicami]$^{\text{INSTR.}}$. (Russian)
Ivan.NOM cut string.ACC scissors.INSTR
'Ivan cut the string with the scissors.'

Crucially, this means that VP-internal Case is available for INSTRUMENT arguments in Russian. As predicted by the current proposal, VP-internal Case-assignment to the INSTRUMENT argument precludes mapping of the INSTRUMENT as an external argument—contrast (63), below, with its English counterpart, in (64):

(63) * [Nozhnicy/nozhnicami]$^{\text{INSTR.}}$ otrezalo [verevku]$^{\text{THEME}}$.
scissors.NOM/scissors.INSTR cut string.ACC

(64) [The knife]$^{\text{INSTR.}}$ cut [the bread]$^{\text{THEME}}$.

The contrast between the Russian (63) and the English (64) supports the conclusion that the internal vs. external mapping of an argument is dependent on VP-internal Case-assignment to that argument—as formalized in (51)—since the latter is expected to depend on the inventory of Case-markings available in a given language.

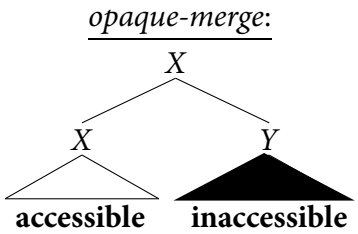
As expected (following (51)), the availability of VP-internal Case for the INSTRUMENT renders it an internal argument (rather than an external one); compare (63), above, with (65):

(65) ? [Verevku]$^{\text{THEME}}$ razrezali [nozhnicami]$^{\text{INSTR.}}$.
string.ACC cut scissors.INSTR
'The scissors cut the string.'

5. *opaque-merge=pair-merge?*

Recall the working definition of *opaque-merge*—(43) in §3.4—repeated below:

(43)



The question was raised as to whether this was indeed a new type of merger (so-called *set-merge'*), or whether this was in fact the *pair-merge* operation, familiar from adjunction (Chomsky 2004). Note that this would not be equivalent to the (obviously false) claim that these arguments "are adjuncts", or that they are introduced into the structure "via adjunction" per se; arguments and adjuncts can

be independently dissociated by the semantic relation between them and the predicates with which they are associated (see Fox 2002).

If *opaque-merge* is actually *pair-merge*, questions arise regarding properties of adjuncts other than their islandhood, which are traditionally associated with *pair-merge*. One of the driving forces behind introducing *pair-merge* was probably so-called "Lebeaux-effects" (Lebeaux 1988, 1998)—the exceptional behavior of adjuncts with respect to Condition C, as exemplified in (66–67) (strikeout indicates unpronounced copies):

(66) a. * He_i bought the oldest book [that Dan_i wanted].

b. [Which book [that Dan_i wanted]]$_1$ did he_i buy [~~which book [that Dan_i wanted]~~]$_1$?

(67) a. * He_i liked the left side [of Dan_i] more.

b. * [Which side [of Dan_i]]$_1$ did he_i like [~~which side [of Dan_i]~~]$_1$ more?

The interesting case is (66b): one would have expected the copy of *which book that Dan wanted*, which is generated as an argument of *buy*, to cause a Condition C violation. Alternatively, in terms of reconstruction (rather than the *Copy/Re-Merge Theory of Movement*), one could say that the obligatory reconstruction in (67b) suggests that reconstruction in (66b) should be obligatory as well, contrary to fact.

The generalization is as follows: phrases contained in an adjoined element can only induce a Condition C violation at their "surface" (i.e. phonologically pronounced) position (as in (66a)), whereas phrases contained in non-adjoined elements induce Condition C violations at their base and intermediate positions as well.

This was handled by Chomsky (2004) by asserting that *pair-merge* attaches constituents on what is essentially a "separate plane", while *TRANSFER*, the preparation for spell-out, "flattens" them into *set-merged* structures. Presumably, this means that *pair-merged* structures are entirely exempt from Condition C effects, while the *set-merged* structures resulting from *TRANSFER* lose this property.

Returning to the current proposal, argument hypothesized to merge via *opaque-merge* exhibit no such effects:

(68) * [Which friend [of Dan_i]]$_1$ did he_i annoy t_1 the most?

Here, *which friend of Dan* is originally merged as the Experiencer of *annoy*. Since Experiencer arguments are B-arguments, they should be merged via *opaque-merge*. The constituent subsequently undergoes wh-movement to the matrix clause, but crucially, this does not exempt the base-position from incurring a Condition C violation.

Lebeaux-effects are thus restricted to actual adjuncts (i.e. unselected modifiers). This appears to contradict the idea that *opaque-merge* is actually *pair-merge*.

However, work by Fox and Nissenbaum (1999), Fox (2002), and Lebeaux (1998), has shown that there is another way to account for Lebeaux-effects—one that does not encode this property on the operation that introduces adjuncts. Their proposal involves late-merger of adjuncts to (overtly or covertly) moved constituents.

Under the late-merger approach, unselected modifiers (i.e. adjuncts) can merge to a constituent at any point in the derivation. Specifically, they can merge to a higher copy, which is the result of movement. Thus, the derivation of (66b), above, would proceed as follows (abstracting away from irrelevant details):

(69) a. he buy [which book]

b. [which book]$_1$ [he buy [~~which book~~]$_1$]

c. [which book [that Dan wanted]] [he buy [~~which book~~]]

Under this analysis, there is never an instance of *Dan* within the c-command domain of the pronoun *he*, and therefore no Condition C violation arises. The same cannot apply to (67b), because the relation between *side* and *of Dan* is thematic:

(70) a. he like [which side]

b. * [which side]$_1$ [he like [~~which side~~]$_1$]

c. * [which side [of Dan]] [he like [~~which side~~]]

For *of Dan* to merge to *side*, the latter must be an event-nominal, which has a thematic role to assign. However, if this is the case, then the lower copy of *which side*, where *side* has no argument, represents a violation of the Theta Criterion. Therefore (70) represents a derivation that will crash at LF.

Unlike Chomsky's *TRANSFER* approach, the late-merger approach captures the difference between arguments and adjuncts in terms of their inherent semantic differences: the former are subject to the Theta Criterion at LF, while the latter are not—as Fox (2002) crucially observes. This allows adjuncts to be absent from the lower copies of a moved constituent, while barring the same from applying to arguments. The immediate result is the restriction of late-merger to adjuncts. Hence, even if adjuncts are attached to the syntactic tree via *pair-merge*, it is no longer necessary to postulate that some property of *pair-merge* is what makes them (partially) resistant to Condition C.

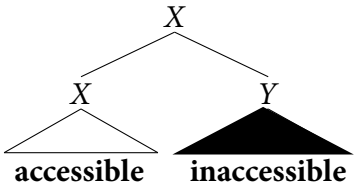
As a result, the grammaticality of (68), repeated below, no longer poses a problem for identifying *opaque-merge* with *pair-merge*:

(68) * [Which friend [of Dan$_i$]]$_1$ did he$_i$ annoy t$_1$ the most?

The argument *which friend of Dan* would be *pair-merged* at its base-position, but it would most certainly not be an adjunct: it is an argument of *annoy*. Likewise, *of Dan* is an argument of *friend*. Thus, neither can be late-merged to their respective heads (since this would result in a violation of the Theta Criterion at LF). They are therefore merged to those heads at their respective base-positions, giving rise to a Condition C violation relative to the pronoun *he*.

The difference between *set-merge* and *pair-merge* is therefore reduced to the islandhood property, repeated in (71), now phrased in terms of *pair-merge* (rather than *opaque-merge*):

(71) *pair-merge*:



The late-merger account may be hence be seen as independently preferable, as it reduces the distinction between *set-merge* and *pair-merge* to a single property (islandhood), and derives the unique properties of adjuncts from their exemption from the Theta Criterion, which is what sets them apart to begin with.

A related but distinct concern, with respect to identifying *opaque-merge* as *pair-merge*, is the following: establishing a Probe-Goal relation is impossible when the goal is inside an adjunct and the probe is outside it. If we are to attribute this property to *pair-merge* itself, then the prediction is that such relations will not be possible with respect to *pair-merged* arguments (previously referred to as *opaque-merged* arguments), either.

It is not clear, however, that such relations ever do arise. Under the assumption that Case is a property of D^0—and that maximal projections lack any labels apart from the head that projects them—Case is a property assigned to DP. As evident in (71), *pair-merge* of *X* and *Y* does not preclude access to *Y* itself; rather, it precludes access to objects that are properly contained in *Y*. Thus, establishing the Probe-Goal relation required for Case assignment to a *pair-merged* DP does not pose a problem.

As an example, recall (1), repeated below:

(1) a. It worried the children that Dan was smoking.

b. hid'ig et ha-yeladim ʃe-Dan me'aʃen. (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

Here, it is the entire EXPERIENCER DP (*the children*) that is hypothesized to undergo *pair-merge*. In this state of affairs, the DP node itself would be perfectly accessible to the verb, or whatever extended functional layer is responsible for assigning accusative Case.

Problematic cases would have to involve Probe-Goal relations formed between a goal properly contained in an argument hypothesized here to be *pair-merged* (i.e., not THEME, SUBJECT-MATTER, or GOAL/SOURCE), and a probe outside of that argument. As of this time, I have yet to encounter such cases—which is at least suggestive that this issue does not pose a major problem for identifying *opaque-merge* as *pair-merge*.

6. Taking Stock

Having identified the operation of *opaque-merge* (as it was tentatively labeled in sections §3.4–§3.6) as none other than Chomsky's (2004) *pair-merge*, let us consider the theoretical landscape of verb-phrase-internal merger—within the current proposal, and without it.

Consider first the state of affairs outside of the current proposal. Chomsky (2004) asserts that adjuncts are merged via *pair-merge*, while all other objects are merged via *set-merge*. To support this stipulation, he gives the following rationale: the Conceptual-Intentional system (C-I) has a distinction between the semantic relation of "argument-taking", and the semantic relation of "predicate composition". Since the C-I interface imposes this requirement on narrow-syntax, the *set-merge*/*pair-merge* distinction is to be taken as a response to this need.[25]

While indeed it is conceptually appealing for narrow-syntax to have some response to the interface condition that Chomsky invokes, it is not at all clear why this would be the particular response. First of all, in what way would islandhood-inducing merger be a response to the need for predicate-composition semantics?[26] Moreover, even if we concede the stipulation that

[25] Given, of course, the *Strong Minimalist Thesis* (SMT): the hypothesis that language is an optimal response to interface conditions, and nothing more (Chomsky 2004).

[26] It seems that if there exists any motivation from outside the domain of syntax for the existence of island-inducing merger, such motivation would come from parseability considerations. As shown (in a somewhat different framework) by Wexler and Culicover (1977, 1980), a language in which any and every constituent could move out of any and every other constituent would constitute a parsing nightmare. Crucially, however, this tells us nothing about why island-inducing merger, once employed by the computational system, would be correlated with adjuncts in particular.

pair-merge and *set-merge* are indeed the narrow-syntactic response to the distinction between "argument-taking" and "predicate composition", why are they correlated in this way, and not vice-versa? In other words, what would rule out a given language choosing *pair-merge* for "argument-taking", and *set-merge* for "predicate composition"?

Under the current proposal, the division is different: some arguments—namely GOAL, SOURCE, SUBJECT-MATTER, and THEME—are merged via *set-merge*. All other arguments, as well as all adjuncts, are merged via *pair-merge*.[27] The first group can be seen as a natural class (in terms of their thematic features; see §3.5), and the second group represents the "elsewhere condition". This is schematized below:

(72) Given a verb V, and an element X merged to V to create a new syntactic object SO:

a. If V assigns X a thematic role whose features are specified only for [−] values, $SO = \textit{set-merge}(\mathrm{V}, X)$

b. Otherwise, $SO = \textit{pair-merge}(\mathrm{V}, X)$

Note that (72b) encompasses arguments whose thematic roles do not fall within (72a), as well as adjuncts. This essentially has the effect of "pushing" the dividing line between *set-merge* and *pair-merge* into the domain of arguments—given that adjunct/argument asymmetries were shown to be predictable without recourse to the merger distinction (see section §5). This is schematized below:

(73) conventional theory: (all adjunct properties explicitly encoded on *pair-merge* operation)

set-merge		*pair-merge*
[−] arguments	other arguments	adjuncts

[27] It may be worthwhile reiterating here, that being introduced into the derivation via *pair-merge* is entirely different from "being an adjunct" or "being adjoined". See section §5.

(74) current proposal: (adjunct properties, except islandhood, derived from late-merger + Theta Criterion)

set-merge	*pair-merge*	
[−] arguments	other arguments	adjuncts

It is clear that the current proposal provides no particular insight with respect to either of the questions posed in the beginning of this section (i.e., why would narrow-syntax choose the *set-merge*/*pair-merge* distinction to distinguish a given set of thematic roles at the interface, and why would association proceed as in (72), and not vice-versa). The point is that it is therefore no more and no less stipulative than the "conventional" view on *set-merge* and *pair-merge*. Crucially, however, it achieves superior empirical coverage (as demonstrated in section §3). In particular, (73) is completely unable to account for base-position islandhood, as discussed in §3.3.

Moreover, the proposal may enable us to do away with *internal argument* and *external argument* as theoretical primitives—a welcome result, especially since their distribution was unaccounted for in the first place (see section §2). Insofar as we would like to keep using *external argument* as a descriptive device, the proposal affords us an accurate working definition—namely (51), repeated below:[28]

(51) "External" argument:

An *opaque-merged* argument that has not checked Case VP-internally

This possibility is the topic of section §7.

7. Do We Really Need Argument Externality?

In section §3, I argued that the distribution of argument externality, shown to resist explanation in existing frameworks, could be accounted for given the definition in (51), repeated above. An obvious question, alluded to in §3.4, is whether it remains necessary to have *external argument* (or *internal*

[28] Not unlike the use of *specifier* and *complement* even having adopted Bare Phrase Structure (Chomsky 1995a).

argument) as a formal notion in the grammar. To answer this, one must consider the properties associated with external arguments. It seems that overwhelmingly, two such properties emerge:

(75) a. If an external argument exists, that argument will be the subject of the clause.

b. External arguments react to "external argument diagnostics" differently than internal arguments do.

The first property is trivially accounted for in the current framework: if the argument identified by (51) has failed to receive Case VP-internally, it obviously must search for Case outside the VP; and the subject position is the only such VP-external Case provider (be it by tensed T^0, ECM, a prepositional complementizer, or any other means).[29]

We are then left with (75b). The relevant question regarding (75b) is what would be lost if the purported sensitivity of a given diagnostic to argument externality were subsumed under sensitivity to the type of merger.

Notice that many external argument diagnostics appear to operate outside the domain of the VP: Italian *ne*-cliticization (Belletti and Rizzi 1981, Burzio 1986, Cinque 1990), French *en*-cliticization (Rizzi 1990), Hebrew possessive datives (Borer and Grodzinsky 1986), and Russian genitive of negation (Pesetsky 1982) are all arguably cases of movement to a position outside VP. If an argument that has checked Case becomes invisible to the rest of the computation (the *Activation Condition*; Chomsky 2001), arguments that have checked Case within the VP will themselves be invisible to operations outside the VP.

It is therefore quite plausible that what these diagnostics are actually sensitive to is *opaque-merge* vs. *set-merge* (or given section §5, *pair-merge* vs. *set-merge*)—and that they simply cannot "see" arguments that have checked Case within the VP.

Reformulating these diagnostics to refer to the type of merger, along with the necessary but perfectly natural caveat on Case, would eliminate the need for a formal notion of *external argument*,

[29] The fact that there always exists such a VP-external Case assigner (in all convergent derivations, that is) is of considerable interest on its own. This property has been examined and discussed extensively by Alexiadou and Anagnostopoulou (2001, 2007).

instead relying on concepts of merger that were shown to be independently necessary to explain base-position islandhood (see §3.3).

Of course, it is by no means a foregone conclusion that every known test of argument externality will lend itself to such a reformulation. Nevertheless, at the very least, replacing recourse to argument externality with a conjunctive formulation involving both merger and Case (along the lines of (51)) will always be possible, and is arguably a small price to pay for eliminating a stipulated primitive from the grammar.

The current proposal thus suggests a research program along the following lines: for every external argument diagnostic, investigating whether that particular diagnostic can be reduced to the *opaque-merge*/*pair-merge* vs. *set-merge* distinction (modulo the *Activation Condition*), or requires explicit recourse to both the type of merger and Case checking (essentially, substituting the conjunctive definition in (51) for references to the *external argument* primitive).

8. Conclusion

The paper began by showing that none of the major existing theoretical frameworks could adequately account for the distribution of argument externality in the Object-/Subject-Experiencer alternation. I suggested that this might be a result of the fact that *external argument* itself is an inadequate theoretical primitive, and therefore, its extension does not constitute a natural class of arguments.

Next, a particular extraction property was investigated: the islandhood of verbal arguments at their base-position (as opposed to their islandhood after movement). This property was shown to partition arguments along lines that formed two coherent sets with respect to mapping as well. Crucially, however, these sets did not correspond to the set of external arguments (i.e., underived subjects) and the set of internal arguments.

Since the above findings already suggest the need for a type of merge operation that induces islandhood at the point of merger, it was proposed that the thematic role assigned to a given argument determines whether it is merged with the aforementioned island-inducing merger, or with

the familiar *set-merge* (Chomsky 2004). It was shown that once this distinction in merger is coupled with the properties of Case-checking within the verb-phrase (specifically, which arguments get their Case checked before leaving the VP), the distribution of argument externality could be consistently predicted.

The sets of thematic roles that undergo each type of merger were shown to be derivable based on Reinhart's (2000, 2002) proposal for featural composition of thematic roles. Specifically, the set of thematic roles undergoing the familiar *set-merge* operation constitutes a natural class, with other arguments, as well as adjuncts, constituting the "elsewhere" case.

Finally, I argued that adopting the late-merger approach to "Lebeaux-effects" (Fox and Nissenbaum, 1999, Fox 2002, Lebeaux 1998) removes any obstacle to identifying the aforementioned islandhood-inducing merger with *pair-merge* (Chomsky 2004). This, in turn, places this proposal on equal ground (in terms of the relative degrees of principled explanation and stipulation) as the common minimalist approach to *set-merge* and *pair-merge*, while achieving superior empirical coverage.

It seems plausible that this proposal allows us to do away with *external argument* as a formal notion. Ideally, any principle that was taken to be sensitive to this notion can be reformulated as being sensitive to the *set-merge*/*pair-merge* distinction (as it is recast in the current proposal), possibly in conjunction with the checking of Case VP-internally. In this sense, the proposal subsumes the primitive notion of *external argument* under the notions of merger and Case, both of which are better-motivated and independently necessary.

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