

Tel-Aviv University
The Lester & Sally Entin Faculty of Humanities
Department of Linguistics

ARGUMENT-MAPPING AND EXTRACTION

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by
Omer Preminger

Thesis Supervisors:

Dr. Tal Siloni
Prof. Tanya Reinhart

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Abstract[†]

In this thesis, I propose a unified account for argument-mapping and islandhood in the verbal domain, while casting new light on the notion of *external argument*, the workings of Case in the verb-phrase, and the interaction of Case and argument-mapping.

I argue that both types of syntactic merger (*set-merge* and *pair-merge*; Chomsky 2004) are used for the merger of verbal arguments. The type of merger determines the islandhood of the argument at its base position, and along with Case-checking, it determines the mapping of the argument as internal or external. The choice of the type of merger is determined by the thematic role assigned to the argument, using the thematic feature system developed by Reinhart (2000).

This approach is shown to have clear empirical advantages, when compared to existing frameworks. In addition, it provides answers for previously unresolved questions about argument externality, to the point of potentially obviating the need for it as a theoretical primitive, deriving it instead from the principles mentioned above.

1. Introduction

This thesis begins by examining the notion of *external argument* in contemporary linguistic theory. Empirically, I will demonstrate that the distribution of argument externality is not handled correctly within existing frameworks. Specifically, I will show that for the case of Object-Experiencer verbs and their Subject-Experiencer alternates, no existing approach correctly predicts which argument will be external and when.

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From a theoretical standpoint, I will demonstrate that the most basic question regarding external arguments has yet to be answered adequately – the question of what is special about their syntactic mapping, when compared with the syntactic mapping of internal arguments.

In addition to these unresolved issues, I will show that certain internal arguments react to syntactic operations as if they were external.

To address these issues, I propose a system in which both types of syntactic merger assumed in minimalist syntax (*set-merge* and *pair-merge*; Chomsky 2004) are used for the merger of verbal arguments. The type of merger is determined by the thematic role assigned to the argument. Specifically, it is dependent on the feature-composition of the thematic role, using the system developed by Reinhart (2000).

The type of merger used determines the islandhood of the argument at its base position, as *pair-merge* creates a domain that is inaccessible to extraction (arguments that have been moved are discussed separately). In addition, I argue that the interaction of *pair-merge* and Case is what determines which (if any) of the arguments will end up being external.

This approach provides answers for the unresolved questions above, while also accounting for the surprising behavior of Object-Experiencer verbs mentioned above. In addition, it is able to account for similar behavior in a sub-class of lexical causative verbs.

Next, I will investigate the islandhood of arguments that are no longer at their base position, and argue for the empirical equivalent of the Freezing Principle (Wexler & Culicover 1977, 1980), which can be subsumed under the restriction of *Internal Merge* to *pair-merge*. This has the advantage of allowing the Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984) to be derived instead of being a primitive, while also accounting for surprising facts regarding extraction in the Dative Shift paradigm. In fact, more careful inspection of Subject Condition effects in languages that do not require obligatory movement of the subject to TP will show a dependency of these effects on the thematic role assigned to the subject – a dependency not unlike the one that is operative in determining the islandhood of internal arguments. The current proposal will afford both of these dependencies the same explanation.

This system, coupled with the late-merger approach of Fox (2002) and Fox and Nissenbaum (1999), allows *set-merge* and *pair-merge* to be construed as minimally different, contrasting only in extractability, without losing crucial predictions regarding the interaction of adjunction and Condition C of the binding theory.

Having shown that Case is integral to determining which argument is external, I will turn to the workings of Case within the verb phrase. I will adopt the dual (structural vs.

thematic/inherent) view of accusative Case proposed by Reinhart and Siloni (2005), and argue that the thematic component of accusative must be checked by the argument whose thematic role licenses accusative Case on the verb to begin with. This enables consistent prediction of which argument will check a verb's accusative Case, which in turn makes the choice of the external argument from among the verb's arguments completely predictable, based on the verb's thematic and Case-related properties.

I will then argue that English and Hebrew lack VP-internal instrumental Case, which accounts for the apparently exceptional behavior of INSTRUMENT arguments within the proposed system. This is supported by data from Russian, a language that has instrumental Case, and does not display the aforementioned behavior with respect to INSTRUMENT arguments. This will lead to a more comprehensive generalization regarding the interaction of Case and argument-mapping.

Finally, I will examine the possibility of eliminating the notion of *argument externality* as a theoretical primitive altogether – instead, deriving its properties from the different types of merger and their interaction with VP-internal Case, along with an empirically motivated constraint on the order in which a verb's arguments are merged.

2. Empirical and Theoretical State of Affairs

The first part of this thesis will explore *external arguments*, as they stand in contemporary linguistic theory. I am not dealing here with the notion “subject” in general. Rather, I am referring to *external arguments* as identified by Belletti and Rizzi (1981) and Burzio (1986), inter alia – namely, the subjects of transitive verbs and unergatives, but not the subjects of unaccusatives or verbal passives. Of course, the two notions are not unrelated: an external argument, if present, will invariably be the argument that surfaces in subject position. I will address this issue in section 6.

2.1. Problems with Externality

Linguistic theory has explicitly recognized the importance of the distinction between external and internal arguments, at least as far back as the seminal work of Williams (1980). So much so, that in contemporary syntactic theory, a separate projection has often been

posited for the sole purpose of merging the external argument into syntax: the little-*v* projection.¹

Despite rich linguistic literature on external arguments, I will show that the following basic questions regarding argument externality have not yet been given satisfactory answers:

- (1) a. How is the external argument chosen from among the verb's arguments?
- b. Once merged, what accounts for its particular syntactic behavior?
In other words, what is syntactically special about external arguments?
- c. Why do certain internal arguments react to syntactic operations as if they were external (see 2.2)?

2.1.1. How is the External Argument Chosen?

2.1.1.1. Some Cross-Linguistic Data

Observe the following paradigm, showing an Object-Experiencer verb and its Subject-Experiencer alternate, in English and in Hebrew:

- (2) a. It worried the children that John was smoking.
- b. hid'ig et ha-yeladim she-Dan me'ashen (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'
- (3) a. The children worried (that John was smoking).
- b. ha-yeladim da'agu (she-Dan me'ashen) (Hebrew)
the-children worried that-Dan smoking
'The children worried (that Dan was smoking).'

This alternation provides several insights regarding the question in (1a), namely how the external argument is chosen. However, it is first necessary to establish which of the arguments in (2-3) are external and which are internal.

English does not mark the alternation in (2-3) morphologically. Therefore, it might be unclear which of the two versions is present in a given derivation. Hebrew proves helpful in this respect. The case in (3), in which the EXPERIENCER argument surfaces as a subject, is

¹ As noted by Horvath and Siloni (2002), this projection has gone by many names: *v*P (Chomsky 1995a), VoiceP (Kratzer 1996), TrP (Collins 1997), and PredP (Bowers 1993). In the course of this thesis, I will be referring to it simply as "little-*v*".

possible only with the form *da'ag(u)*. In contrast, the case in (2), in which the EXPERIENCER argument does not surface as a subject, is possible only with the form *hid'ig*. I will therefore use Hebrew to apply diagnostics of argument externality to each derivation.

I will start by examining the cases in (3).

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 ([XP V S]), or *simple inversion*, in which nothing precedes the verb ([V S]). Simple inversion is possible only when the subject is an internal argument. Thus, verbal passives (4a) and unaccusatives (4b) allow it, while unergatives (4c) do not:

- (4) a. putru shlosha morim (Hebrew)
fired.PASV three teachers
 'Three teachers were fired.'
- b. higi'u shlosha necigim
arrived three representatives
 'Three representatives arrived.'
- c. * rakdu shlosha yeladim
danced three children

As shown below, the verb in (3b) (*da'agu* 'worried') patterns with the unergative in (4c) – it does not allow simple inversion, indicating that its EXPERIENCER argument is external:

- (5) * da'agu shlosha studentim (Hebrew)
worried three students

Another diagnostic for argument externality in Hebrew is modification by a possessive dative constituent. As noted by Borer and Grodzinsky (1986), a dative constituent can serve as the possessor for the subject only if the subject is an internal argument. Therefore, it can serve as the possessor for the subjects of verbal passives (6a) and unaccusatives (6b), but not for the subjects of unergatives (6c):

- (6) a. le-mi butal ha-shi'ur? (Hebrew)
to-who cancelled.PASV the-lesson
 'Whose lesson was cancelled?'

b. le-mi nishbera ha-kos?
to-who broke the-glass
 ‘Whose glass broke?’

c. * le-mi axlu ha-‘orxim?
to-who ate the-guests

As shown below, the verb in (3b) (*da’agu* ‘worried’) patterns with the unergative in (6c) – the dative constituent cannot be the possessor of the EXPERIENCER argument, indicating once again that the EXPERIENCER argument is external:

(7) * le-mi da’ag ha-student (me-ha-macav) (Hebrew)
to-who worried the-student from-the-situation

The picture that emerges is therefore that in the cases in (3), the EXPERIENCER argument is an external argument.

I will now consider the cases in (2), turning first to the SUBJECT MATTER argument.

When an argument is a clause instead of a DP, it is exempt from the (overt) Case requirements that apply to DP’s. If the argument is also internal, it can form an expletive-associate chain with an expletive in subject position. In such a configuration, the argument remains in-situ in its internal position. Crucially, this option is not available for an external argument, whether it is clausal or not. Thus, this option is available with verbal passives (8a) and raising predicates (8b), but unavailable when the clause is an external argument (8c-d) (Reinhart 2001):

- (8) a. It was said [that John would be late].
 b. It seems (to Mary) [that John is late].
 c. * It biased the judge [that the defendant was wealthy].
 d. * It broke the window [that we were throwing rocks at it].

As shown by Reinhart (2001), the SUBJECT MATTER argument in (2) (*that John was smoking*) patterns with the arguments of verbal passives and raising predicates (8a-b), allowing the expletive-associate construction:

(9) It worried the children [that John was smoking].

This indicates that the SUBJECT MATTER argument is internal.

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

- (10) a. ?? [His_i doctor] visited [every patient]_i.
b. [His_i health] worried [every patient]_i.

The marginality of (10a) is a standard case of weak-crossover. Following Reinhart (2001), what salvages (10b) is that the SUBJECT MATTER argument (*his health*) is an internal argument. This can bleed weak-crossover effects, since as an internal argument, *his health* is base-generated in a position that is c-commanded by *every patient*, and it can then reconstruct to that position to receive its bound-variable interpretation at LF. In that case, *every patient* no longer needs to undergo Quantifier Raising, and weak-crossover is averted.

Therefore, in the cases in (2), the SUBJECT MATTER argument is internal. As for the post-verbal accusative-marked EXPERIENCER argument in (2), it is internal as well. Its accusative marking may be sufficient evidence of this, but the same can be shown using the possessive dative diagnostic (similar to (6)):

- (11) le-mi hid'ig ha-macav et ha-yeladim? (Hebrew)
to-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.

To summarize, the cases in (2) lack external arguments. Specifically, the EXPERIENCER arguments in (2a-b) are internal. The EXPERIENCER arguments in (3a-b), on the other hand, are external.

2.1.1.2. Possible Explanations

In this section, I will examine several possible explanations for the data presented above. Specifically, the aim is to predict the distribution of *argument externality*: under which conditions a given argument will be mapped as external, and under which conditions it will be mapped as internal.

2.1.1.2.1. Thematic Explanations

The thematic roles involved in (2) and in (3) are the same (presumably, EXPERIENCER and SUBJECT MATTER; see Pesetsky 1995; Reinhart 2001). This means that question (1a) (how the external argument is chosen) cannot be answered in terms of thematic information alone.

First, consider positing a projection such as little-*v*, and restricting the set of thematic roles it can assign to the argument it merges (the external argument). In such a system, if a thematic role is part of the given set, it will be merged by little-*v*, and if not, it will be merged by the verb itself. For example, the AGENT thematic role will almost certainly be part of this set, as AGENT arguments are invariably mapped as external arguments. However, as pointed out by Horvath and Siloni (2002), the EXPERIENCER role is either part of this set or not, so such an approach cannot explain why the EXPERIENCER argument is internal in (2), but external in (3).²

Second, since there is no difference between (2) and (3) in any of the thematic roles involved, even accounts in terms of thematic hierarchies will fail to explain these facts.

2.1.1.2.2. Burzio's Generalization

Since the formulation of Burzio's generalization (Burzio 1986), the presence of an external argument has been tied to the existence of accusative Case on the verb. In some cases, the little-*v* projection has been the mechanism used to encode this generalization in the grammar (cf. *v**P vs. *v*P; Chomsky 2001, 2004).

However, as noted by Reinhart (2001), the picture that emerges in (2-3), repeated below, constitutes an exception to Burzio's generalization:

(12) a. It worried the children that John was smoking.

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

² As Horvath and Siloni (2002) point out, this state of affairs represents more than just a case that little-*v* cannot account for. It is in fact a counter-argument for the Little-*v* Hypothesis altogether – the two verbs in (2-3) are clearly derivationally related, and it would be completely ad-hoc to assume that in (2), the EXPERIENCER role is associated with the verbal head, while in (3), the same role is introduced by a separate head (little-*v*).

- (13) a. The children worried (that John was smoking).
 b. ha-yeladim da'agu (she-Dan me'ashen) (Hebrew)
the-children worried that-Dan smoking
 'The children worried (that Dan was smoking).'

The verbs in (12) lack external arguments but have accusative Case (overtly manifested in Hebrew (12b)), while the verbs in (13) have external arguments but lack accusative Case. Therefore, 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.

2.1.1.2.3. The Theta System

In the Theta System, as developed by Reinhart (2002), arguments are given syntactic mapping based on thematic information and derivational relations between lexical entries. Without going into the details of the analysis here, the result is that EXPERIENCER arguments are mapped as external arguments, unless some other argument preempts this mapping. In the Theta System, the thematic roles that can preempt an EXPERIENCER's external mapping are AGENT, CAUSE, and SENTIENT – none of which are present in the cases in (2-3). Thus, the different behavior of the EXPERIENCER argument in (2) and in (3) poses a problem for the Theta System as well (as Reinhart herself notes; see Reinhart 2001).

2.1.1.3. Intermediate Summary

It therefore appears that there is no framework currently available that is capable of dealing with the mapping facts exemplified in (2-3). This, despite the fact that the constructions in (2-3) would hardly be considered cumbersome or uncommon.

2.1.2. What is syntactically special about External Arguments?

Another problem facing the notion of argument externality is that of the syntactic encoding of this property. Namely, once syntactic structure is formed, what is the inherent difference between the mapping of an external argument and an internal one that causes the two to react differently to various syntactic operations?

The framework of Bare Phrase Structure (Chomsky 1995b) aims to eliminate stipulated levels of X-bar structure. Thus, it abandons the primitive distinction between specifier and complement, viewing them instead as derivative structural observations.

Horvath and Siloni (2002) argue for the rejection of the Little-*v* Hypothesis. However, as they point out, this leaves open the question of how to map the sole argument of an unergative verb in a position different from the sole argument of an unaccusative verb (given the assumptions of Bare Phrase Structure), as the behavior of external and internal arguments is known to differ. Consider two simple cases:

- (14) a. John ran.
b. John arrived.

Linear order is not considered part of narrow-syntax. Thus, given the rejection of Little-*v* Hypothesis, the VP in each of the cases in (14a-b) would be as represented in (15a-b), respectively:

- (15) a. [_{VP} John [_V run]]
b. [_{VP} John [_V arrive]]

What differentiates *John* in (15a) from *John* in (15b), in terms of their syntactic status? If both are the only argument of V^0 , what accounts for the difference in syntactic behavior between the two?

2.2. Extraction: More Data

Yet another piece of the puzzle, which will turn out to be related to argument-mapping, can be found in some subtle properties of extraction from verbal arguments.

It is well known that external arguments block extraction. This is covered, though not exhaustively of course, by the Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984). The picture regarding internal arguments, however, is more complex:

- (16) a. [Which students]₁ did the counselor meet [teachers of t₁]?
b. * [Which students]₁ did the situation worry [teachers of t₁]?
(adapted from Johnson 1992, and Landau 2001)

Surprisingly, both in (16b) and in (17b), an EXPERIENCER argument blocks extraction despite being internal.³

³ Johnson (1992), who is also quoted by Landau (2001), states that this is only true when the subject is non-agentive. English speakers that I have checked with do not share this judgment. The same is true of Russian speakers consulted by Belikova and Preminger (2004). Moreover, even if Johnson is correct, this would still be a result that demands explanation, given that the EXPERIENCER argument is internal in both cases.

The same situation arises in Russian:⁴

- (17) a. [Iz kakogo universiteta]₁ vy priglasili [studentov t₁]? (Russian)
from which university you.PL invited students
 ‘Which university did you invite the students of?’
- b. * [Iz kakogo universiteta]₁ novosti vzvolnovali [gostej t₁]?
from which university news worried visitors
- (adapted from Belikova & Preminger 2004)

One could conceivably seek an explanation for this in terms of structural configuration. Object-Experiencer verbs are three-place predicates (their thematic roles are CAUSE, EXPERIENCER, and SUBJECT MATTER; see Pesetsky 1995; Reinhart 2001). As such, they can be argued to project a VP-shell structure (Larson 1988). As a result, the EXPERIENCER argument would be mapped to a specifier position.

As observed by Huang (1982) and Kayne (1984), most specifiers block extraction. This has been captured by various theoretical mechanisms, such as the Condition on Extraction Domains (CED; Huang 1982). Hence, one could argue that the reason for the islandhood of the EXPERIENCER argument in (16b) and (17b) is structural – namely, that the EXPERIENCER argument occupies a specifier position.

However, such an account is insufficient, as can be seen below:

- (18) a. Who₁ did you give [a picture of t₁] to John?
 b. Who₁ did you give a picture [to acquaintances of t₁]?
 (adapted from Landau 1994)

For (18a-b), any phrase-structure that assumes *Binary Branching* (Kayne 1984) (including Larsonian VP-shells) will have at most one complement position in which an argument of *give* can be merged.⁵ Therefore, explaining the blocking of extraction in (16b) and (17b) in

⁴ For Russian examples, transliteration (and not phonetic transcription) is used:

a=a b=b v=v r=g d=d e=e ë=jo ж=zh з=z и=i й=j k=k л=l м=m н=n o=o п=p р=r c=s т=t y=u
 ф=f x=kh ц=c ч=ch ш=sh щ=shh ь=’ ы=y ь=’ э=eh ю=jу я=ja

⁵ To be exact, the structure will have at most one “pure complement” position. I use the term “pure complement” to denote a node from which a path to C⁰ exists, such that this path crosses only nodes of complementation.

Obviously, even given *Binary Branching*, adjunction can introduce a complex constituent that contains other complement nodes. However, none of these will qualify as “pure complements”, given this definition.

terms of structural configurations (i.e. specifier vs. complement) is at odds with the data in (18a-b), which constitutes an obvious exception to the generalization that the CED attempts to capture.

The conclusion is that neither the external vs. internal argument distinction, nor the specifier vs. complement distinction, are able to predict extractability in these cases (for a discussion of Dative Shift, see section 3.4). Essentially, this represents a case where certain internal arguments pattern with external arguments, with respect to a given syntactic operation (though by no means the only case; cf. 5.2.1.2).

2.3. Towards a Generalization

So far, I have shown that both the distribution of argument externality and the status of arguments in terms of islandhood defy explanation using currently available frameworks.

To reach a satisfactory account, let us start by looking again at the empirical facts at hand. Given the data presented in sections 2.1-2.2, three groups of verbal arguments can be identified:

- (19) a. A-arguments: arguments that are always mapped externally (e.g. AGENT)
b. B-arguments: arguments that are sometimes mapped externally and sometimes mapped internally (e.g. EXPERIENCER; see 2.1.1)
c. C-arguments: arguments that are always mapped internally (e.g. THEME⁶)

Consider the interaction between externality and accusative Case, for each of the groups defined above:

⁶ The actual picture regarding THEME arguments is a bit more complex. There is a class of verbs known as Emission Verbs or Theme Unergatives (Horvath & Siloni 2002; Levin & Rappaport-Hovav 1995; Reinhart 2000, 2002), which are one-place unergatives that select a THEME argument.

The existence of external THEME arguments poses a problem for the proposed framework. This can be handled by restricting the discussion to multi-place predicates (i.e. verbs with two or more arguments), or verbs derived from multi-place predicates (such as the unaccusative alternate of a transitive verb; see Reinhart 2000, 2002).

It is important to note, however, that the existence of such verbs is equally problematic for other frameworks, including those discussed in section 2.1.1.2, and would therefore require a similar caveat.

- *A-arguments* never check accusative Case
- *B-arguments* are mapped externally when they do not check accusative Case (recall (2-3), in 2.1.1)
- *C-arguments* are never mapped externally

This is normally taken to be a result of some principle along the following lines (which may or may not be derived from other properties of the verbal Case-checking system):

(20) Only when an argument is internal, can it check accusative Case.

However, consider the possibility that cause and effect are actually reversed:

(21) When a *B-argument* does not check accusative Case, it is external.

In fact, since *A-arguments* never check accusative Case, the generalization stated in (21) can be expanded somewhat:

(22) When an *A/B-argument* does not check accusative Case, it is external.

Next, consider extraction, taking into account the data from section 2.2.

The Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984) covers the blocking of extraction from two of the groups defined above:⁷

- from arguments that are always mapped externally (*A-arguments*)
- from arguments that can be external (*B-arguments*), when they are indeed external

However, *B-arguments* block extraction regardless of external/internal mapping (recall (16b) and (17b) in section 2.2, in which an EXPERIENCER argument blocks extraction even when mapped internally).

Therefore, splitting verbal arguments into these groups is advantageous in capturing the properties of two seemingly distinct phenomena – argument-mapping and extraction:

⁷ Of course, this does not exhaust the cases covered by the Subject Condition. Even *C-arguments* may block extraction when they appear in subject position. As I will argue later, this is a separate issue, which has to do with the islandhood of moved constituents. See section 3.4.

- *A/B-arguments*:
 - block extraction (regardless of mapping)
 - mapped externally when they fail to check accusative Case
- *C-arguments*:
 - allow extraction⁸
 - never mapped externally

Given an accurate definition for *A-arguments*, *B-arguments*, and *C-arguments*, a unified account of argument-mapping and extraction could be formulated. Ideally, this account would also explain the difference between *A-arguments* and *B-arguments* more clearly – namely, why *A-arguments* never check accusative Case (and are therefore always external). This last point will be addressed in detail in 4.2.

3. Proposal

3.1. Background: Feature-Composition of Thematic Roles

Reinhart (2000) proposes decomposing thematic roles into features. Under this view, the standard thematic roles (AGENT, THEME, EXPERIENCER, etc.) are not primary entities of the grammar, but rather labels for feature clusters.

(23) Feature-composition of thematic roles (Reinhart 2000):

- ±c: whether or not the argument in question is responsible for causing change (in the context of the given event)
- ±m: whether or not the mental state of the argument in question is relevant (to the given event)

Every thematic role is a cluster of these features. In a given cluster, each feature can be valued for /+ or /-, or unvalued (in which case both interpretations of the feature are possible).

⁸ To be exact, *C-arguments* can block extraction, but only if they move first. See fn. 7.

The conventional thematic roles are composed as follows:

(24) Thematic roles (Reinhart 2000):

	+m	no /m	-m
+c	AGENT	CAUSE	INSTRUMENT
No /c	SENTIENT	∅	SUBJECT MATTER
-c	EXPERIENCER	GOAL/SOURCE/BENEFACTIVE	THEME

As shown by Reinhart (2000, 2001, 2002), this system proves advantageous in predicting various grammatical properties which otherwise defy explanation.

As an example, consider the case of unaccusative verbs. As argued by Reinhart (2000), precise definition of the set of unaccusative verbs is a desideratum, both in terms of theoretical completeness, and more importantly, in terms of learnability. Though the set of unaccusative verbs is obviously finite, it is quite large. Therefore, acquiring each member of the set separately seems extremely cumbersome. Furthermore, in English, there is neither morphological marking of unaccusative verbs, nor very substantial syntactic evidence to distinguish verbs in this set (25a) from one-place unergative verbs (25b):

- (25) a. She₁ moves t₁ gracefully.
 b. She dances gracefully.

(Reinhart 2000)

Reinhart demonstrates that attempts to define the set of unaccusative verbs in terms of their aspectual properties (Borer 1994; Van Hout 1995; Van Valin 1990; inter alia) cannot be considered successful, while other prevailing accounts (Levin & Rappaport-Hovav 1994, 1995; Pesetsky 1995) also fail to account for the full range of facts (see Reinhart 2000, for the precise argumentation in each case).

However, as Reinhart shows, the feature system in (23-24) does allow precise definition of the set of unaccusative verbs. The definition is given below:

- (26) A verb is unaccusative **iff** its concept includes a CAUSE ([+c]) role, and that role is reduced (not realized).

Under normal circumstances, (26) means the verb has an alternate that has an additional CAUSE role, as in (27):

- (27) a. [The vase]_{THEME} broke.
 b. [The wind]_{CAUSE} broke [the vase]_{THEME}.

However, there may be instances in which a specific entry is non-existent in a given language (to be exact, it is frozen, existing in the lexicon but not usable in a syntactic derivation; Chierchia 2004). Consider *fall*, which is unaccusative but lacks an English counterpart that has an additional CAUSE ([+c]) role. It turns out that such a lexical entry does exist in Hebrew:

- (28) a. ha-cincenet₁ nafla t₁ (Hebrew)
the-jar fell
 ‘The jar fell.’
- b. ha-ruax hipila et ha-cincenet
the-wind “made fall” ACC the-jar
 ‘The wind made the jar fall.’

As can be seen in (28b), Hebrew has a transitive alternate of *nafal* ‘fell’, which has an additional CAUSE ([+c]) role.

Now recall (25a-b), repeated below:

- (29) a. She₁ moves t₁ gracefully.
 b. She dances gracefully.
 (Reinhart 2000)

Given Reinhart’s system, the child knows that (29a) is unaccusative, since the concept *move* has a CAUSE ([+c]) role that is unrealized here. The concept *dance*, however, does not have a CAUSE ([+c]) role. Therefore, (29b) must have an unergative derivation.

Notice that while *dance* does have a causative form, as in (30a), the additional role in this form is an AGENT ([+c +m]), and not a CAUSE ([+c]), as shown by the ungrammaticality of (30b):

- (30) a. John danced Mary around the room.
 b. * [The enthusiasm]/[Her enthusiasm] danced Mary around the room.

The feature system presented in (23) thus allows a precise definition of the set of unaccusative verbs. Many other cases where linguistic analysis can benefit from this system are cited by Reinhart (2000, 2001, 2002).

3.2. The Proposed System

To account for the generalizations reached in section 2.3, I propose the following system:

(31) Lexical Determination of Merger:

- a. **uniform [-] clusters:** merged into syntax via *set-merge*, the structure-building operation standardly assumed for canonical complementation (i.e. complements of functional heads, canonical direct objects, etc.) (Chomsky 2004)
→ creating a domain that is accessible for extraction
- b. **other clusters:** merged into syntax via *pair-merge*, the structure-building operation standardly assumed for adjuncts (Chomsky 2004)
→ creating an island for extraction

In other words, the feature-composition of the thematic role discharged on a given argument determines the type of syntactic merger that inserts that argument into the derivation.

THEME ([-c -m]), GOAL/SOURCE/BENEFACTIVE ([-c]) and SUBJECT MATTER ([-m]) roles are uniform [-] clusters, and therefore arguments receiving these roles will be merged via *set-merge*. All other arguments will be merged via *pair-merge*.⁹

Note that the fact that an argument is *pair-merged* does not mean it is late-merged (Fox & Nissenbaum 1999; Fox 2002). On the contrary, I assume *pair-merge* is subject to the same cyclicity conditions as *set-merge*. The issue of late-merger, as well as its consequences for Condition C effects, is orthogonal to the *set-merge/pair-merge* dichotomy. See 3.6.1 for further discussion.

3.3. The Predictions

In this section, I will show that the proposal above correctly predicts the facts presented in sections 2.1-2.2, regarding argument-mapping and extraction – facts which previously defied explanation.

⁹ The insight that uniform [-] clusters form a natural class, and that this class behaves in a distinct fashion with respect to merger, is due to Reinhart (2002). In her system, however, belonging to this class of thematic roles has different consequences than in the system proposed here. Furthermore, her proposal sub-divides the remaining thematic roles, resulting in a system with three natural classes, and not two, as proposed here.

3.3.1. Extraction

Let us examine how the proposed system accounts for the extraction-related facts shown in section 2.2. Recall (16a-b), repeated below:

- (32) a. [Which students]₁ did the counselor meet [teachers of t₁]?
b. * [Which students]₁ did the situation worry [teachers of t₁]?
(adapted from Johnson 1992, and Landau 2001)

The bracketed argument in (32a) receives the role of THEME ([-c -m]), which is a uniform [-] cluster. It is therefore merged via *set-merge*, predicting its accessibility to extraction. The bracketed argument in (32b), however, receives the role of EXPERIENCER ([-c +m]), which is not a uniform [-] cluster. It is therefore merged via *pair-merge*, predicting its islandhood.

Compare this with (18a-b), repeated below:

- (33) a. Who₁ did you give [a picture of t₁] to John?
b. Who₁ did you give a picture [to acquaintances of t₁]?
(adapted from Landau 1994)

The bracketed arguments in (33a) and in (33b) receive the roles of THEME ([-c -m]) and GOAL ([-c]), respectively. Both are uniform [-] clusters. Therefore, both are merged via *set-merge*, predicting their accessibility to extraction (for a discussion of Dative Shift, see section 3.4).

The advantage of divorcing accessibility to extraction from the external/internal mapping of arguments, and from their structural configuration (i.e. specifier vs. complement), becomes clear:

- Both of the bracketed arguments in (32a-b) are internal, but their extraction-related properties differ.
- At most, one of the two bracketed arguments in (33a-b) can be in complement position, but their extraction-related properties are the same.

Therefore, CED-inspired accounts for extractability, which are based on either argument externality or the specifier/complement distinction (Huang 1982; Kayne 1984) cannot deal with the data presented here. Unlike such accounts, the proposed system correctly predicts this behavior.

Notice that this proposal essentially incorporates Kayne's (1994) intuition that specifiers are an instance of adjunction, since given the proposed system, most verbal arguments that occupy a specifier position will indeed be *pair-merged* – an idea originally proposed by Horvath and Siloni (2002).¹⁰ The two approaches diverge precisely on cases such as (33a), above, which represents felicitous extraction from a specifier position. Under this proposal, (33a-b) contain a specifier that is not *pair-merged*, and therefore does not pattern with adjuncts, in terms of islandhood.

We are now in a position to answer question (1c):

Question (1c): Why do certain internal arguments react to syntactic operations as if they were external?¹¹

Answer: Such internal arguments behave this way because they are *pair-merged* (on par with external arguments – as discussed in 3.3.2, below).

3.3.2. Externality

Let us now turn to the facts relating to argument-mapping, as presented in section 2.1. Recall the argument groups identified in section 2.3:

- *A/B-arguments*:
 - block extraction (regardless of mapping)
 - mapped externally when they fail to check accusative Case
- *C-arguments*:
 - allow extraction
 - never mapped externally

The system proposed in 3.2, in addition to handling the extraction data presented in section 2.2, necessarily fixes the classification of arguments into these groups. For example, arguments receiving thematic roles that are uniform [-] clusters are *set-merged*, allowing extraction. Therefore, they must be *C-arguments*. Likewise, all other arguments (which are *pair-merged*, blocking extraction) must be *A/B-arguments*.

¹⁰ Horvath and Siloni's (2002) suggestion is that specifiers are invariably merged via *pair-merge*, a proposal that would clearly fail to capture the intricacies of extraction from internal arguments, as discussed in this section.

¹¹ Extraction represents one such operation – but by no means the only one (cf. 5.2.1.2).

Since *A/B-arguments* and *C-arguments* have not only extraction-related properties, but also mapping-related properties, this classification results in precise predictions regarding how these arguments will be mapped:

- Arguments receiving roles that are uniform [-] clusters (i.e. *C-arguments*) must always be mapped internally.
- Arguments receiving other roles (i.e. *A/B-arguments*) must be mapped internally if and only if they check accusative Case.

One can now check if the mapping of these arguments to external/internal positions is in fact consistent with these predictions. Recall (2-3), repeated below:

(34) a. It worried the children that John was smoking.

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

(35) a. The children worried that John was smoking.

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

As shown in 2.1.1, the EXPERIENCER arguments in (35a-b) are external, while the cases in (34a-b) do not contain external arguments.

Given the thematic feature system in 3.1, the thematic roles involved in (34-35) are composed as follows:

- EXPERIENCER: [-c +m]
- SUBJECT MATTER: [-m]

The SUBJECT MATTER role is a uniform [-] cluster. The argument receiving this role is therefore a *C-argument*. As such, it should never be external, regardless of whether or not it checks accusative Case.

The EXPERIENCER role is a mixed cluster. The argument receiving this role is therefore an *A/B-argument*. Thus, it should be mapped externally precisely when it does not check accusative Case.

This is exactly the picture that emerges in (34-35). The SUBJECT MATTER argument is internal in both (34) and (35). As for the EXPERIENCER argument, its mapping is indeed

dependent on accusative Case. The verb in (34) has accusative Case, which is checked by the EXPERIENCER argument (as can be seen overtly in (34b)). The EXPERIENCER argument is therefore mapped internally in (34). The verb in (35), on the other hand, does not have accusative Case. This allows the EXPERIENCER argument to be mapped externally (see 2.1.1 for the relevant diagnostics).

One can now answer the two remaining questions, (1a-b):

Question (1a): How is the external argument chosen?

Answer:

(36) External Argument:

A pair-merged argument that does not check accusative Case.

Question (1b): What is syntactically special about external arguments? Specifically, what is the syntactic difference between how the sole argument of an *unergative* verb is mapped and how the sole argument of an *unaccusative* verb is mapped?

Answer: The difference is in the type of operation that attaches the argument to the syntactic tree: *set-merge* vs. *pair-merge*.

Notice that the formulation of externality without reference to the specifier/complement distinction allows different mapping for external and internal arguments without stipulated X-bar structure or little-*v*, which as discussed in 2.1.2, is a desirable result.¹²

3.4. Movement and Islandhood: Completing the Picture

The brief discussion of ditransitive verbs in sections 2.2 and 3.3.2 did not deal with the phenomenon of Dative Shift. This section will deal with Dative Shift and related issues.

3.4.1. Dative Shift and Extraction: The Data

In the interest of perspicuity, I will adopt the terminology used by Larson (1988), i.e. *Dative Construction* will refer to the derivation containing overt dative marking (as in (37)),

¹² The relationship between argument-mapping and accusative Case, besides its evident empirical adequacy, may seem rather arbitrary at this point. This is hardly so, however, as will be shown in section 6.

below), and *Double Object Construction* will refer to the result of Dative Shift, where no overt dative marking is visible (as in (38), below).

Recall the data regarding extraction in the Dative Construction (18), as presented in 2.2 and repeated below:

- (37) a. Who₁ did you give [a picture of t₁] to John?
b. Who₁ did you give a picture [to acquaintances of t₁]?
(adapted from Landau 1994)

As shown above, in the Dative Construction, both the THEME and the GOAL arguments are possible domains for extraction. As argued in 2.2, this is important counter-evidence for the validity of a generalization on extraction that relies on the specifier/complement distinction, such as the CED (Huang 1982).

The facts regarding extraction in the Double Object Construction are different:

- (38) a. * Who₁ did you give [acquaintances of t₁] a picture?
b. Who₁ did you give John's acquaintances [a picture of t₁]?
(adapted from Landau 1994)

Somewhat surprisingly, Dative Shift appears to affect the islandhood of the GOAL argument (the bracketed argument in (38a)). I will account for this property in the following sub-section.

3.4.2. The Interaction of Movement and Islandhood

There are two issues, related to the current proposal and to islandhood effects, which have remained unexplained so far:

- Dative Shift extraction facts, as shown in 3.4.1, above
- Residual Subject Condition effects – as is well known, even arguments that allow extraction at their base positions, are islands when moved to subject position. Notice the difference between extracting from the bracketed argument in (39a) and in (39b), as shown in (40a) and (40b), respectively:

- (39) a. It seems strange to Mary [that John would enjoy rock music].
b. [That John would enjoy rock music] seems strange to Mary.
(40) a. [Which music]₁ does it seem strange to Mary [that John would enjoy t₁]?
b. * [Which music]₁ does [that John would enjoy t₁] seem strange to Mary?

It is clear what these two issues have in common. If one accepts Larson's (1988) analysis of Dative Shift, the Double Object Construction (38) involves movement of the GOAL argument from its thematic position (on par with verbal passivization; op. cit.). Similarly, the difference between (40a) and (40b) is whether or not the bracketed argument is at its base position.

These facts are reminiscent of Wexler and Culicover's Freezing Principle:

(41) Freezing Principle (adapted from Wexler & Culicover 1977, 1980):

A constituent that has undergone movement becomes an island.

More recent work has introduced the view that movement is simply *Internal Merge*, meaning the merger of a syntactic object that is already present in the derivation, into the derivation once more (Chomsky 2004, 2005). Given this, the Freezing Principle itself can be derived from the following restriction:

(42) *Internal Merge* is always *pair-merge*.

As discussed in section 3.2, the notion of *pair-merge* under this proposal is subject to the same cyclicity conditions as *set-merge* – the issue of late-merger being orthogonal to the *set-merge/pair-merge* dichotomy (see section 3.6.1). Therefore, the restriction in (42), together with the system presented in 3.2, gives rise to the possibility of deriving most (if not all) strong-island effects from the application of *pair-merge* – since this would cover the islandhood of adjuncts and moved constituents, as well as the verbal arguments discussed above.

Furthermore, as shown below, adopting (42) has the advantage of making the Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984) a derivable property, instead of a grammatical primitive, further increasing the proposal's coverage in terms of predicting islandhood.

3.5. Deriving the Subject Condition

As discussed in 2.1.2, the move to Bare Phrase Structure (Chomsky 1995b), means abandoning the primitive distinction between specifier and complement. Given this, the

Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984) can no longer be taken to be an instantiation of the inherent properties of the specifier position.¹³

In this respect, it is important to note that there is cross-linguistic variation on whether overt movement to subject position (SpecTP) is obligatory.

Accounting for the Subject Condition therefore involves answering two separate questions:

- (43) a. What prevents extraction from an argument that has moved to TP?
b. What prevents extraction from external arguments at their base positions?

Given the current proposal, an answer to (43b) is readily available. Recall the answer to question (1a) (how the external argument is chosen), namely the definition in (36), repeated below:

(44) External Argument:

A pair-merged argument that does not check accusative Case.

The fact that an external argument (if one exists) blocks extraction at its base position is a result of the type of merger that attaches it to the syntactic tree – namely *pair-merge*, which creates a domain that is inaccessible to extraction.

The answer to (43a) can be found in the restriction (42) reached in section 3.4.2, and repeated below:

(45) *Internal Merge* is always *pair-merge*.

Thus, if an argument has moved to TP, it should become an island by virtue of that movement.

One would therefore predict that if the subject is *set-merged* (as would be the case in unaccusative verbs and verbal passives, given the current proposal), and the language allows the subject to stay in-situ, extraction from it should be possible. This is indeed the case, as

¹³ Notice that this is independent of the issue of little-*v*. As pointed out in 2.1.1.2, I adopt Horvath and Siloni's (2002) arguments for the rejection of the Little-*v* Hypothesis, as the latter is incompatible with the data presented in 2.1.1 (see fn. 2). However, even if one accepts the Little-*v* Hypothesis, it does not provide a clear advantage in explaining the blocking of extraction from subjects, unless an additional stipulation is made regarding the properties of the *v*P projection in general, and its specifier in particular.

can be seen from the contrast in (46a-b), involving the Hebrew verbal passive *ne'emar* 'was said':

- (46) a. * ma_1 [she-Dan ohev t_1] ne'emar li? (Hebrew)
what that-Dan likes said.PASV to.1sg
- b. ma_1 ne'emar li [she-Dan ohev t_1]?
what said.PASV to.1sg that-Dan likes
 'What was it said to me that Dan likes?'

The cases in (46a-b) differ in whether or not the subject has moved to TP. The subject (in both cases) receives the role of THEME ([*-c -m*]), which is a uniform [*-*] cluster. Given the current proposal, this means it is inserted at its base position via *set-merge*. Hence, extraction from it is possible precisely when it has not been moved (46b).

Unlike Hebrew, English requires subjects to move to TP overtly. However, there are exceptions to this: since clausal arguments are exempt from the Case requirements that apply to DP's, they can remain in-situ, with an expletive pronoun in subject position instead. Thus, the English counterparts of (46a-b) are possible, and in fact behave the same way:

- (47) a. * What₂ [that John likes t_2]₁ was said t_1 to me?
 b. What₁ was it said to me [that John likes t_1]?

Even more striking is the case of *ne*-cliticization in Italian. As can be seen in (48), Italian does not require overt movement of the subject to TP, on par with Hebrew:

- (48) a. Arriveranno molti esperti (Italian)
will.arrive many experts
 'Many experts will arrive.'
- b. Telefoneranno molti esperti
will.telephone many experts
 'Many experts will telephone.'

(data from Burzio 1986)

Belletti and Rizzi (1981), Burzio (1986), and Cinque (1990) discuss the syntactic behavior of the *ne* clitic, which replaces the nominal complement of a quantifier in Italian. As discussed by Cinque (1990), *ne*-cliticization is possible only from "structural object" positions, including direct (but not oblique) objects, and post-verbal subjects of passives, unaccusatives, and impersonal *si* constructions.

Consider the contrast between the applicability of *ne*-cliticization to the post-verbal subject of an unaccusative verb (49a), and its inapplicability to the post-verbal subject of an unergative verb (49b):

- (49) a. Ne arriveranno molti (Italian)
NE(of-them) will.arrive many
 ‘Many of them will arrive.’
- b. * Ne telefoneranno molti
NE(of-them) will.telephone many
- (data from Burzio 1986)

This is particularly striking in light of the fact that unlike the Hebrew and English examples in (46a-b) and (47a-b), respectively, the relative position of verb and subject in (49a) and in (49b) is does not differ.

Given the current proposal, the subject of (49a) receives the role of THEME ([-c -m]), which is a uniform [-] cluster, and is therefore attached to its base position via *set-merge*. The subject of (49b) receives the role of AGENT ([+c +m]), which is not a uniform [-] cluster, and is therefore attached to its base position via *pair-merge*.

Assuming *ne*-cliticization involves movement out of the quantified noun-phrase, this contrast accounts for the contrast in islandhood shown in (49).

The facts in (46-47, 49) show the dependency of Subject Condition effects on the thematic role of the argument in question, therefore providing support for the dual nature of the Subject Condition, as described in (43a-b), repeated below:

- (50) a. What prevents extraction from an argument that has moved to TP?
 b. What prevents extraction from external arguments at their base positions?

While (50a) is not thematically discriminating, (50b) is. Under the current proposal, this dependency on thematic roles is reduced to an explainable dependency on the type of merger involved: if an argument is not *pair-merged*, it will show Subject Condition effects only in case it is an overt subject – in other words, moved to TP – since *Internal Merge* is always *pair-merge* (45).

Moreover, this dependency on thematic roles is in no way unique to subjects, as shown by the case of internal EXPERIENCER arguments, which block extraction (see sections 2.2, 3.2). The current proposal affords both of these thematic dependencies the same explanation: different thematic roles result in a predictably different type of merger being used to merge the argument at its base position.

In conclusion, the Subject Condition is derivable, as a conflation of two separate phenomena: the islandhood of moved constituents, and the islandhood of constituents that have been *pair-merged* at their base positions.

3.6. A New View on the Set-Merge/Pair-Merge Distinction

3.6.1. Adjuncts and Condition C

The discussion in 3.3-3.5 does leave one question open – that of the apparently divergent behavior of adjuncts and other *pair-merged* constituents. Recall that *pair-merge* was invoked by Chomsky (2004) to account for the exceptional behavior of adjuncts with respect to Condition C:

- (51) a. * He_i bought the book [that John_i wanted].
 b. [Which book [that John_i wanted]]₁ did he_i buy [~~which book~~ [that John_i wanted]]₁?
 (52) a. * He_i liked the picture [of John_i].
 b. * [Which picture [of John_i]]₁ did he_i like [~~which picture~~ [of John_i]]₁?
 (strikeout indicates unpronounced copies)

The interesting case is (51b): one would have expected the copy of [*which book that John wanted*], which is generated as an argument of *buy*, to cause a Condition C violation.

The generalization is as follows: phrases contained in an adjoined element (51) can only induce a Condition C violation at their “surface” (i.e. phonologically pronounced) position (as in (51a)), while phrases contained in non-adjoined elements (52) 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 plain”, while *TRANSFER*, the narrow-syntactic 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 that result from their *TRANSFER* lose this property.

However, given the current proposal, arguments receiving thematic roles that are not uniform [-] clusters are also merged via *pair-merge*. Yet these arguments exhibit no such bleeding effects. Consider the following example:

- (53) * [Which sister [of Bill_i]]₁ did he_i think [t₁ kissed John]?

Here, [*which sister of Bill*] is originally merged as the AGENT of *kissed*. Since AGENT ([+c +m]) is not a uniform [-] cluster, it is merged via *pair-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.

The effects are therefore restricted to actual adjuncts (i.e. unselected modifiers). This appears to contradict the idea that *pair-merge* is the operation responsible for the merger of both types of constituents.

However, recent work by Fox (2002) and Fox and Nissenbaum (1999) has shown that there is a completely different way to account for the Condition C facts in (51-52). Their proposal involves late-merger of adjuncts to (overtly or covertly) moved constituents.

Under Fox and Nissenbaum’s 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 a result of *Internal Merge* (i.e. movement). Thus, the derivation of (51b), above, would proceed as follows (abstracting away from irrelevant details):

- (54) a. he buy [*which book*]₁
 b. [*which book*]₁ [he buy [~~*which book*~~]₁]
 c. [*which book* [*that John wanted*]] [he buy [~~*which book*~~]₁]

Under this analysis, there is never an instance of *John* within the c-command domain of the pronoun *he*, and therefore no Condition C violation occurs. The same cannot apply to (52), because the relation between *picture* and [*of John*] is thematic:

- (55) a. he like [*which picture*]₁
 b. [*which picture*]₁ [he like [~~*which picture*~~]₁]
 c. [*which picture* [*of John*]] [he like [~~*which picture*~~]₁]

For [*of John*] to merge to *picture*, the latter must be an event-nominal, which has a thematic role of THEME to assign. However, if this is the case, then the lower copy of [*which picture*], where *picture* has no argument, represents a violation of the Theta Criterion. Therefore (55a-c) represent a derivation that will crash at LF.¹⁴

¹⁴ Notice that the Theta Criterion itself can be viewed as a “bare output condition”, derivable from the fact that LF structures need to be interpreted (Chomsky 1995a; Heim & Kratzer 1998). See Fox (2002) for some discussion of the status of optional thematic roles in this respect.

Thus, 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 (Fox 2002). 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 though 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 (53), repeated below, no longer poses a problem to the proposed system:

(56) * [Which sister [of Bill_i]]₁ did he_i think [t₁ kissed John]?

The argument [*which sister of Bill*] is *pair-merged* at its base position, but it is most certainly not an adjunct. It is an argument of *kissed*; likewise, [*of Bill*] is an argument of *sister*. 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 with respect to the pronoun *he*.

Perhaps the most important consequence of adopting the late-merger proposal, with respect to the current proposal, is the fact that it reduces the difference between *pair-merge* and *set-merge* to one property alone: the blocking of extraction. Since *set-merge* and *pair-merge* are theoretical primitives, it is independently desirable that the difference between them would be one single primitive property, rather than having a collection of differing properties.

3.6.2. Beyond Explanatory Adequacy: The “Why” of *Pair-Merge*

Recall the restriction (42) reached in section 3.4.2, and repeated below:

(57) *Internal Merge* is always *pair-merge*.

Given the Strong Minimalist Thesis (Chomsky 1995a, 2004), one should ask why this would be so. I suggest an explanation below.

Since the onset of minimalist syntax, it has been asserted that *Merge* “comes for free”, in the sense that it is a necessary starting point for any system of recursive hierarchy (Chomsky

1995a, 2000). In later works, it has been argued that *Internal Merge* is equally “free”, in the sense that it would require additional stipulation to exclude the application of *Merge* to a syntactic object from within the derivation, rather than from the lexical array (Chomsky 2004, 2005).

However, none of this provides an explanation for why there should be two types of merger (*set-merge* and *pair-merge*). The fact that there are two such types is empirically motivated, of course, based on the divergent behavior of complementation and adjunction in terms of extraction, but in terms of the Strong Minimalist Thesis, only *set-merge* seems to have a “principled explanation”. Even if the Conceptual-Intentional interface demands a separate way to encode the predicate-composition operation associated with adjunction (as asserted by Chomsky 2004), it is not clear why a type of *Merge* that blocks extraction would be the mechanism chosen to do this.

However, if the descriptive equivalent of the Freezing Principle (41) is a necessary condition for either language learnability (as argued by Wexler & Culicover 1977, 1980), or language processing (i.e. needed in order for language parsing to be possible), then it can be viewed as a legibility condition on language itself.

As such, it would provide an answer not only for why the restriction in (57) exists, but also for why a type of merger that creates islands (i.e. *pair-merge*) would exist in the first place.

In other words, if the descriptive equivalent of the Freezing Principle is a legibility condition on language, and movement is simply *Internal Merge*, then the Computational System must include the constraint in (57). For this, a type of merger that creates islands is necessary – and thus, the existence of *pair-merge* has a “principled explanation”.¹⁵

¹⁵ Given that the Computational System makes full use of the operations available to it (as long as convergence and local economy are preserved), it is perhaps not surprising that the use of *pair-merge* is not restricted to *Internal Merge*, but also found elsewhere (adjunction, and under the current proposal, specific argument-predicate relations). However, the reasons for this precise pattern of use (apart from the use for *Internal Merge*) are not clear at this point. A possibility is that it is indeed a way to encode different types of semantic relations for the Conceptual-Intentional interface. Of course, this point demands further research, which is outside the scope of the current work.

4. Case and the Verb Phrase

4.1. The Duality of Accusative Case

As demonstrated in sections 2.3 and 3, the checking of accusative Case determines whether certain arguments will be mapped externally or not. In the context of the current proposal, this has been captured by (36), repeated below:

(58) External Argument:

A pair-merged argument that does not check accusative Case.

It is therefore desirable to uncover the principles that determine which of the verb's arguments checks accusative Case.

At first glance, this may seem misguided, as the existence of ECM constructions appears to demonstrate that there can be no such principle:

(59) John believes [_{TP} *it*_{ACC} to be suprising that Mary is late].

What (59) appears to show, is that the DP checking accusative Case on a verb need not be an argument of that verb. In fact, it need not be an argument at all, as *it* in (59) is an expletive pronoun.

However, this may not be the entire picture. Reinhart and Siloni (2005) propose that Case of any type, and specifically accusative, has a structural component and a thematic (inherent) component.

What (59) shows, then, is something about the structural component of accusative Case. Under Reinhart and Siloni's proposal, the pronoun *it* checks the structural component of accusative on *believes*, while the entire TP checks the thematic component. Therefore, as Reinhart and Siloni argue, the availability of ECM constructions in a given language is dependent upon the existence of the structural component of accusative Case in that language.

Let us further explore this duality of Case. First, notice that the two components of accusative Case cannot be checked independently of one another:

(60) * John believes [_{it_{expl.}}]_{thematic-ACC} [_{TP} [_{Bill}]_{structural-ACC} to be intelligent].

Given the ungrammaticality of (60), one might ask what prevents a derivation where the expletive pronoun *it* checks the thematic component of accusative Case, while the DP *Bill* checks the structural component.

Intuitively, the expletive *it* cannot check the thematic component of Case in (60) because it does not receive a thematic role. However, this is not sufficiently accurate:

(61) * [*It*_{expl.}]_{NOM} believes John_{thematic-ACC} [TP [*Bill*]_{structural-ACC} to be intelligent].

(Assuming it is John who believes, and Bill's intelligence is the content of that belief.)

Notice that prima facie, (61) should not represent a violation of the Case filter, as the expletive pronoun *it* receives nominative Case, and each of the proper names *John* and *Bill* receives a separate component of accusative. In (61), then, thematic accusative is assigned to a constituent that does receive a thematic role (*John*), but it is the “wrong” thematic role. It therefore appears that the thematic component of accusative Case is thematically discriminating – perhaps not a very surprising result, given that to begin with, thematic Case was meant to formally enforce the Theta Criterion in narrow-syntax (Reinhart & Siloni 2005).

A reasonable place to start exploring the precise nature of such a constraint – a thematic constraint on the checking of thematic accusative Case – is the condition that licenses accusative Case on the verb to begin with. Reinhart (2002) proposes the following:

- (62) a. If a verb has both a uniform [+] cluster and a fully specified /-c cluster (i.e. [-c ±m]), mark the verb for accusative Case.
- b. Derivational operations in the lexicon reduce accusative Case.¹⁶

Consider the following constraint on the checking of accusative:

- (63) a. Thematic accusative Case: Must be checked by the argument α that receives the [-c ±m] role involved in accusative licensing (i.e. in (62a))
- b. Structural accusative Case: Must be checked either by α itself, or by a DP that is dominated by α (in other words, the DP that checks structural accusative must be weakly-dominated by α)¹⁷

¹⁶ If a language has both the structural and thematic components of accusative Case, only the thematic component is reduced (Reinhart & Siloni 2005).

¹⁷ In the terminology of Fox and Pesetsky (2005), structural accusative Case must be checked by a DP that “reflexively-dominates” α .

This captures both the behavior of ECM constructions such as (59), and the behavior of thematic verbal arguments that are PP's – in which the preposition (P^0) assigns structural Case to its DP complement (Botwinik-Rotem 2004), but the entire PP, which dominates DP, checks thematic Case on the verb (Reinhart & Siloni 2005). For further discussion, see 4.2, below.

4.2. Coming Full Circle – Predicting Externality based on Lexical Information Alone

In 2.1.1, I demonstrated that externality could not be predicted in terms of thematic information alone, due to the thematic equivalence of (2) and (3), repeated below:

(64) a. It worried the children that John was smoking.

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

(65) a. The children worried that John was smoking.

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

As argued in section 2.1.1, the thematic roles involved in (64) and in (65) are the same – however, in (64) neither argument is mapped externally, while in (65) the EXPERIENCER argument is mapped externally (this was demonstrated in detail in 2.1.1).

As shown in sections 2.3 and 3, this is due to differences in the checking of accusative Case. Putting this in terms of the proposal in section 3: in (64), the EXPERIENCER argument checks accusative Case, leaving no *pair-merged* argument that does not check accusative (the SUBJECT MATTER argument is *set-merged*; see section 3).

The verbs in (65), however, lack accusative Case. Given the current framework, this is a result of the lexical operation that derives them, which reduces accusative (see (62b), in 4.1). Thus, the EXPERIENCER argument is a *pair-merged* argument that does not check accusative Case, and is therefore mapped externally.

This shows that thematic considerations cannot be sufficient in predicting which argument will be external, due to the interaction with accusative Case-checking. However, given the

principles in 4.1, the choice of which argument will check accusative Case can also be predicted. Thus, if one takes into consideration the full range of lexical information associated with a verb (both thematic and Case-related), the external vs. internal mapping of arguments can be predicted. I will illustrate this below.

4.2.1. A Taxonomy of Arguments

4.2.1.1. Uniform [+] Clusters and INSTRUMENT Arguments

Recall the Case-checking principle (63), repeated below:

- (66) a. Thematic accusative Case: Must be checked by the argument α that receives the [-c \pm m] role involved in accusative licensing (i.e. in (62a))
- b. Structural accusative Case: Must be checked either by α itself, or by a DP that is dominated by α (in other words, the DP that checks structural accusative must be weakly-dominated by α)

Given this principle, arguments receiving thematic roles that are either uniform [+] clusters (AGENT [+c +m], CAUSE [+c], and SENTIENT [+m]), or the INSTRUMENT ([+c -m]) role, can never check accusative Case.¹⁸

Recall the definition in (36), repeated below:

- (67) External Argument:

A pair-merged argument that does not check accusative Case.

Given the current proposal, uniform [+] clusters and INSTRUMENT ([+c -m]) arguments are *pair-merged* (since neither is a uniform [-] cluster; see 3.2). Thus, in accordance with (67), their failure to check accusative Case will invariably result in external mapping.

In terms of the generalizations made in section 2.3, these constitute precisely the group of *A-arguments* – arguments that are always mapped externally, never check accusative Case, and always block extraction.

As shown in section 3.4, this property of blocking extraction is in fact a conflation of two facts: the islandhood of these arguments at their base positions (which is due to the fact that they are *pair-merged* into the derivation), and the islandhood of arguments that have moved to subject position.

¹⁸ For a detailed discussion of INSTRUMENT arguments and their behavior, see 4.3.

4.2.1.2. EXPERIENCER Arguments

The EXPERIENCER ([-c +m]) role is not a uniform [-] cluster. Therefore, just like the arguments discussed in 4.2.1.1, arguments receiving the EXPERIENCER role are *pair-merged*. However, unlike the arguments discussed in 4.2.1.1, EXPERIENCER arguments can check accusative Case, since the EXPERIENCER cluster meets the [-c ±m] criterion (see (66)).

This gives rise to the previously puzzling behavior of EXPERIENCER arguments, which was discussed in detail in sections 2.1-2.2:

If an Experiencer-verb has accusative Case, the EXPERIENCER argument will check it, resulting in internal mapping, and if the verb lacks accusative Case, the EXPERIENCER argument will be mapped externally (see (86)). The type of merger that attaches the argument to the syntactic derivation will invariably be *pair-merge*, accounting for the fact that these arguments are islands even when internal.

As in 4.2.1.1, the islandhood these arguments display when mapped externally is a conflation of being *pair-merged* into the derivation at their base positions, and the islandhood of arguments that have moved to subject position.

In terms of the generalizations made in section 2.3, these constitute exactly the group of *B-arguments* – arguments that are sometimes mapped externally and sometimes mapped internally (depending on whether or not they check accusative Case), but block extraction regardless of their mapping.

4.2.1.3. Uniform [-] Clusters

Arguments receiving thematic roles that are uniform [-] clusters are *set-merged*, so they can never qualify for external mapping, regardless of accusative Case-checking. This is because an external argument is necessarily a *pair-merged* argument (see (86)).¹⁹

The fact that they are *set-merged* accounts for the fact that they allow extraction at their base positions (modulo language specific constraints such as the availability of preposition-stranding, etc.). When moved to subject position, their islandhood stems from movement itself, as shown in section 3.4.

¹⁹ Once again, this must be restricted to multi-place predicates (i.e. verbs with two or more arguments), or verbs derived from multi-place predicates (such as the unaccusative alternate of a transitive verb; see Reinhart 2000, 2002). This is because of the existence of Emission Verbs or Theme Unergatives (Horvath & Siloni 2002; Levin & Rappaport-Hovav 1995; Reinhart 2000, 2002), which are one-place unergatives that select a THEME argument. See fn. 6.

In terms of the generalizations made in section 2.3, these constitute exactly the group of *C-arguments* – arguments that are always mapped internally and always allow extraction at their base positions.

4.2.2. Predicting Externality – The Generalization

As shown in 4.2.1.1-4.2.1.3, the current proposal allows consistent prediction of which argument (if any) will be mapped externally – unlike any of the existing theoretical frameworks (see 2.1.1.2). It does so based on thematic and Case-related properties of the verb in question. To summarize:

- (68) An argument will be mapped externally when it is *pair-merged* (which happens when it receives a thematic role that is not a uniform [-] cluster), and fails to check accusative Case. This can happen for two reasons:
- a. The verb lacks accusative Case, - *or* -
 - b. The thematic role assigned to the argument does not meet the accusative Case-checking criterion (i.e. it is not a [-c ±m] role; see 4.1).

4.3. Does English have Instrumental Case?

INSTRUMENT arguments present an interesting challenge to the proposed system. Let us take the following observation as the starting point for a discussion of Instruments in the VP:

- (69) The Instrument Generalization:

An Instrument can be realized **iff** an AGENT role is also realized in the derivation, or contextually inferred.

(Reinhart 2000, 2002; Reinhart & Siloni 2005; Siloni 2002)

One consequence of (69) is that an Instrument adjunct can be added freely to any verb that assigns an AGENT role:

- (70) John climbed up to the second floor [with a ladder].

In (70), the Instrument is licensed by the presence of an AGENT (*John*) in the derivation.

Another consequence of (69) is that in order to license an Instrument, the verb does not need to assign an AGENT role specifically, but rather any role that can be interpreted as an AGENT. As explained in 3.1, when a thematic feature is unvalued in a given cluster, both interpretations of it are possible. For example, the CAUSE ([+c]) role assigned by a verb like

break can be interpreted as an AGENT ([+c +m]) role, as in (71a), because the /m feature is underspecified in the original [+c] cluster. In that case, and in that case only, *break* can license an Instrument. In contrast, when the CAUSE ([+c]) role is interpreted as a “pure” CAUSE (as in (71b)), an Instrument cannot be added (though, as shown, there is nothing wrong with such an interpretation in the absence of an Instrument).

- (71) a. John broke the glass (with a hammer).
b. The storm broke the window (*with the branch of a nearby tree).
(adapted from Reinhart 2000)

The felicity of Instruments in examples (70) and (71a) is therefore predictable, based on the Instrument Generalization (69). Thus, due to learnability considerations, one would not want to include the Instrument in the lexical information associated with each of these verbs. It is therefore reasonable to assume that these Instrument modifiers are adjuncts. Further support for this view stems from the fact that the licensing of the Instrument in (71a) must occur post-lexically: in the lexicon, *break* does not have an AGENT role. Its CAUSE role is interpreted as an AGENT post-lexically, and only then, the Instrument Generalization can apply.

It would appear, though, that not all Instruments are adjuncts. Consider the following paradigm:

- (72) a. Max cut the apple.
b. The knife cut the apple.
c. * The sharpness (of the blade) cut the apple.
(adapted from Reinhart 2002)

Recall that the CAUSE ([+c]) role is underspecified for the /m feature. It is therefore compatible with any of the following three interpretations (depending on the specific value given to the underspecified /m feature when interpreted): AGENT ([+c +m]), INSTRUMENT ([+c -m]), or “pure” CAUSE ([+c]) (see 3.1).

The ungrammaticality of (72c) shows that the “pure” CAUSE interpretation is unavailable for the argument of *cut* that surfaces as the subject. As argued by Reinhart (2002), this means that verbs like *cut* cannot assign a CAUSE role. Rather, they must assign the following roles:

- (73) *cut*: AGENT, THEME, INSTRUMENT

To account for the absence of the AGENT argument in (72b), Reinhart postulates the following principle: whenever a verb selects two clusters with a /+c feature, only one is obligatory realized in syntax. I will return to this issue shortly.

The system presented in section 3 makes several predictions regarding the behavior of an INSTRUMENT that is a thematic argument (i.e. an argument selected by the verb, part of the lexical information associated with the verb):

(74) The INSTRUMENT ([+c -m]) role is not a uniform [-] cluster.

Therefore, it should be merged via *pair-merge*. Results:

- a. It can be external (in case it does not check accusative Case).
- b. It is predicted to be an island for extraction.

It seems that (74a) is indeed borne out, as *the knife* is mapped externally in (72b). Perhaps a more disturbing issue is that these verbs seem to violate the prediction in (74b):

- (75) a. The pirate cut the ropes [with a part of the magical blade].
b. [Which blade]_i did the pirate cut the ropes [with a part of t_i]?

The grammaticality of (75b) seems to show that thematic INSTRUMENT arguments are not islands, as was predicted in (74b) that they should be.

However, how can one be sure that the PP headed by *with* in (75a-b) is indeed a thematic INSTRUMENT argument? The sentences in (75) contain an AGENT (*the pirate*), and so in accordance with the Instrument Generalization (69), an Instrument adjunct should be possible, on par with its licensing in (70).

It is therefore desirable to test whether the *with*-PP in derivations such as (75) shows any other characteristics that are typical of adjuncts. Consider the following contrast:

- (76) a. ? (The police report stated that) Mary cut him_i [with John's_i (own) knife].
b. * (The police report stated that) Mary sent him_i [to John's_i (own) doctor].

While (76a) is far from perfect, it is certainly better than (76b). Notice that the oddity of (76a) probably has nothing to do with structural relations. Consider the following example:

- (77) ? (The police report stated that) Mary met him_i [after John's_i (own) testimony].

In (77), it is reasonable to assume that the bracketed PP can adjoin to TP; certainly, it can adjoin at a position higher than the pronoun *him*. The oddity of (77) is therefore probably the result of a discourse-related preference for *John* to appear before the coreferential

pronoun *him*. Therefore, the acceptability of (77) should be taken as a baseline when evaluating (76a-b).

As a result, the contrast in (76a-b) demonstrates that the *with*-PP in sentences such as (76a) has, at the very least, the option of attaching at a position that is not c-commanded by *him*, while the *to*-PP in (76b) does not have this option.

A reasonable assumption is that the *with*-PP in (76a) is adjoined to VP (or at least can be), while the *to*-PP in (76b) is argumental, and therefore c-commanded by *him*.²⁰

So far, this demonstrates that the option of realizing the *with*-PP as an Instrument adjunct (and not an INSTRUMENT argument) is available. Nevertheless, how does this pertain to its islandhood? Surely, as an adjunct, it should block extraction as well. Surprisingly, this is not the case. Recall (71a), repeated below:

(78) John broke the glass [with a hammer].

As mentioned before, the licensing of the *with*-PP in cases like (78) is clearly not part of the lexical information associated with *break*. Surprisingly, such *with*-PP's do not block extraction:

- (79) a. Alexander the Great broke the Gordian knot [with the tip of his own sword].
b. Which blade₁ did Alexander the Great break Gordian knot [with a part of t₁]?

The same behavior is exhibited by so-called “Instruments” that are added to Object-Experiencer verbs – which like *break*, assign a CAUSE role (and do not have an INSTRUMENT as part of their lexical entry – Pesetsky 1995; Reinhart 2001):²¹

- (80) a. The teacher worried his students [with stories about disease and famine].
b. What₁ did the teacher worry his students [with stories about t₁]?

²⁰ The precise details of this structural relation depend on the specific analysis for the syntactic structure of ditransitive derivations. For example, assuming Larson's (1988) analysis, *him* is in the specifier of the lower VP-shell, while the *to*-PP is the complement of the lower V⁰ head. However, regardless of the specific analysis one adopts for ditransitive derivations, it is generally agreed upon that the c-command relation between the THEME (in this case, *him*) and the GOAL (in this case, the *to*-PP) holds, as the relevant binding facts suggest.

²¹ The term “Instrument” is used here in its wider sense, meaning any verbal modifier that matches the [+c -m] cluster (i.e. an individual that *causes change* in the context of the event, but whose *mental state* is decidedly irrelevant to the event; see 3.1). Note that if one does not accept that *with*-PPs like those in (80) are indeed Instruments, one is left with yet another type of adjuncts that allow extraction, since these constituents cannot possibly be arguments of *worry*. This is because Object-Experiencer verbs can never realize both their CAUSE and SUBJECT MATTER arguments (Pesetsky 1995; Reinhart 2001).

It therefore appears that Instrument adjuncts, in general, allow extraction – a fact that is indeed surprising, but not limited to manner-verbs such as (75b), repeated below:

(81) [Which blade]₁ did the pirate cut the ropes [with a part of t₁]?

Thus, the felicity of extraction in (81) cannot be taken as counter-evidence to the prediction in (74b), which states that INSTRUMENTS that are arguments should block extraction. The case in (81) may just as easily be a case where the INSTRUMENT argument is not realized, and an Instrument adjunct is licensed by the Instrument Generalization (69), and the presence of an AGENT (*the pirate*). Recall that it was independently shown that the Instrument in such cases shows adjunct-like behavior (see (76), above), and such adjuncts were shown to allow extraction (see (79-80), above).

Taking this idea a step further, consider the possibility that English lacks instrumental Case altogether. If this is true, then the only possible way to realize a VP-internal Instrument is as an adjunct. Conversely, the only option of realizing a thematic INSTRUMENT argument is as a subject, where it receives nominative Case (which is obviously thematically indiscriminating).

Given this, not only are both predictions (74a) and (74b) borne out, but the stipulation made by Reinhart (2002), regarding the possibility of realizing an Instrument without the presence of an AGENT argument (as in (72b)), is no longer necessary – it follows instead from Case theory. Under the current proposal, the VP of such verbs has only two instances of Case to assign, nominative and accusative. Accusative must be checked on the THEME argument (for reasons that were discussed in 4.1-4.2). Therefore, the thematic AGENT and the thematic INSTRUMENT are left to compete for nominative Case. Realizing both of them as arguments would result in a noun-phrase without Case. Thus, the only way an AGENT and Instrument can co-exist is if the latter is an adjunct, as discussed above.

This analysis makes further predictions: given a language that, unlike English, can be demonstrated to have true instrumental Case, one would expect a different picture to emerge. Specifically, the situation with manner-verbs (such as *cut*), where two arguments compete for the thematically indiscriminating nominative Case assigner, should no longer occur. The INSTRUMENT argument should be able to get VP-internal Case-marking, and therefore would not need to move to TP.

Moreover, if the INSTRUMENT argument of manner-verbs surfaces VP-internally, and is marked with instrumental Case, it represents precisely the scenario that proved so elusive in English – a true VP-internal thematic INSTRUMENT (i.e. one that is not an adjunct). As such, the system would predict that it would adhere to the prediction made in (74b) – namely, being an island for extraction.

As it turns out, these predictions are all borne out in Russian, a language that has morphologically identifiable instrumental Case.

Recall that in English, the *with*-PP's that can appear with manner-verbs exhibit adjunct-like behavior. In Russian, the INSTRUMENT argument can receive (VP-internal) instrumental Case, and therefore does not require T⁰ in order to receive Case. Hence, all three roles (AGENT, THEME, and INSTRUMENT) can be realized as arguments in the same derivation:

- (82) a. Ivan chistil jabloko nozhom (Russian)
 Ivan.NOM peeled apple.ACC knife.INSTR
 ‘Ivan peeled an/the apple with a/the knife.’
 b. Ivan otrezal verevku nozhnicami
 Ivan.NOM cut string.ACC scissors.INSTR
 ‘Ivan cut a/the string with (the) scissors.’

Next, consider movement to TP:

- (83) a. * Nozhom chistilo jabloko (Russian)
 knife.INSTR peeled apple.ACC
 b. * Nozhnicami otrezalo verevku
 scissors.INSTR cut string.ACC

As predicted, such movement of an INSTRUMENT argument (which has already received instrumental Case) is ruled out. In fact, as shown below, VP-internal Case-marking of the INSTRUMENT argument is obligatory. Leaving the INSTRUMENT argument without instrumental Case, and subsequently moving it to TP to receive nominative Case, is impossible as well:

- (84) a. * Nozh chistil jabloko (Russian)
 knife.NOM peeled apple.ACC
 b. * Nozhnicy otrezali verevku
 scissors.NOM cut string.ACC

Compare this state of affairs with (85a-b), below. As discussed earlier, verbs such as *open* and *break* select a CAUSE ([+c]) role, and since the CAUSE role is underspecified for the value of the /m feature, the role is compatible with an INSTRUMENT ([+c -m]) interpretation. In comparison with actual INSTRUMENT arguments (82-84) (and specifically the nominative-marked INSTRUMENT arguments in (84)), these (INSTRUMENT-interpreted) CAUSE arguments are much better in subject position:

- (85) a. (?)ključ otkryl dver' (Russian)
 key.NOM opened door.ACC
 b. (?)Vetka razbila okno
 branch.NOM broke window.ACC

It therefore appears that INSTRUMENT arguments differ from CAUSE arguments that are interpreted as INSTRUMENT. The former require (VP-internal) instrumental Case, while the latter behave as expected of CAUSE arguments – failing to receive VP-internal Case, and moving to TP for nominative Case assignment.

Recall the definition of externality in (36), repeated below:

- (86) External Argument:

A pair-merged argument that does not check accusative Case.

Given the facts above, it would appear that in Russian, not only does accusative Case preclude argument externality, but instrumental Case does as well. This suggests the following modification:

- (87) External Argument (in Russian):

A pair-merged argument that does not check accusative or instrumental Case.

To generalize, it seems that for a given language, the set of VP-internal morphological Cases are precisely what precludes argument externality. Therefore, a more general version of (86) would be:

- (88) External Argument (generalized version):

A pair-merged argument that does not check Case VP-internally.

This will therefore be the version of the condition on *argument externality* that I will use from this point onwards.

Finally, another prediction is that VP-internal INSTRUMENT arguments should be islands for extraction at their base position, since they are *pair-merged* (this prediction originally appeared as (74b)). Compare (89a-b):

- (89) a. ? [Iz kakogo magazina]₁ Ivan poterjal [nozh t₁]_{THEME?} (Russian)
from which store Ivan lost knife.ACC
- b. * [Iz kakogo magazina]₁ Ivan chistil jabloko [nozhom t₁]_{INSTR?}
from which store Ivan peeled apple.ACC knife.INSTR

As shown above, extraction from an INSTRUMENT argument at its base position is blocked (89b), unlike extraction from a THEME argument (89a). Given the current proposal, this is expected, due to the difference in the type of merger involved.

5. Other Types of Verbs

Section 3 showed how the proposed system handles the previously problematic data regarding the distribution of argument externality in EXPERIENCER derivations (as presented in section 2.1), and the islandhood of certain internal arguments (as presented in section 2.2).

This is perhaps a good point at which to check how the current proposal fares with regard to other well-studied classes of verbs. That will be the focus of this section.

5.1. Well-Studied Classes of Verbs

In this section, I will review several well-studied classes of verbs, and demonstrate how the proposed system deals with each class.²² Each sub-section will refer only to principles that already appeared in sections 3 and 4, and show the predictions that the system makes with respect to the class of verbs in question.

5.1.1. CAUSE Subjects

5.1.1.1. THEME Objects

Examples: *open, break, melt, etc.*

The base entry for these verbs is a two-place entry:

- (90) V: CAUSE ([+c]), THEME ([-c -m])

The condition that licenses accusative Case on a verb's lexical entry, given in (62a), is repeated below:

- (91) If a verb has both a uniform [+] cluster and a fully specified /-c cluster (i.e. [-c ±m]), mark the verb for accusative Case.

²² I will largely be following the taxonomy of verbs used by Reinhart (2002).

Since CAUSE ([+c]) is a uniform [+] cluster, and THEME ([-c -m]) qualifies for the [-c ±m] criterion, the verb's entry will have accusative Case:

(92) V_{ACC} : CAUSE ([+c]), THEME ([-c -m])

The THEME argument will be merged via *set-merge*, because it is a uniform [-] cluster, while the CAUSE argument will be merged via *pair-merge*, because it is not a uniform [-] cluster (see 3.2).

Recall the condition on accusative Case checking (63a), repeated below:

(93) Thematic accusative Case: Must be checked by the argument α that receives the [-c ±m] role involved in accusative licensing

This means that only the THEME argument can check accusative Case. Now recall the revised definition of argument externality (88), repeated below:

(94) External Argument (generalized version):

A *pair-merged* argument that does not check Case VP-internally.

The CAUSE argument (and only it) qualifies for the criterion in (94). Therefore, the verb will surface with the CAUSE argument mapped externally, and the THEME argument mapped internally. This is indeed borne out:

(95) a. [The wind/Max/the key]_{CAUSE} opened [the door]_{THEME}.

(Reinhart 2002)

b. [ha-ruax/Dan/ha-mafteax]_{CAUSE} patax [et ha-delet]_{THEME} (Hebrew)

the-wind/Dan/the-key opened ACC the-door

‘The wind/Dan/the key opened the door.’

In addition, the CAUSE argument is predicted to block extraction at its base position (because it is *pair-merged* there), while the THEME argument is predicted to allow extraction at its base position (because it is *set-merged* there). While the former may be somewhat difficult to test in English (due to obligatory movement of the subject to TP), the latter is borne out:

(96) [Which room]₁ did you open [a door to t₁]_{THEME} yesterday?

Finally, recall (42), repeated below:

(97) *Internal Merge* is always *pair-merge*.

Following this principle, both arguments are predicted to block extraction when movement has applied. As mentioned above, the CAUSE argument (which is mapped externally, and will

therefore always be the subject) obligatorily moves to TP. The resulting islandhood is indeed attested, in what would more traditionally be described as a Subject Condition violation:

(98) * [Which neighbors]₁ did [children of t₁]_{CAUSE} open the door?

When moved, the THEME argument should also block extraction. Consider (100a-b), which are versions of (99a-b) in which the THEME argument has undergone Heavy-NP Shift. As predicted, extraction out of the THEME is possible in (99b), but impossible in (100b):

(99) a. John opened [a suspiciously squeaky door]_{THEME} yesterday.

b. [Which room]₁ did you open [a suspiciously squeaky door to t₁]_{THEME} yesterday?

(100) a. John opened [t₁]_{THEME} yesterday [a suspiciously designed door]₁.

b. * [Which room]₂ did you open [t₁]_{THEME} yesterday [a suspiciously designed door to t₂]₁?

Reinhart (2000, 2002) shows that universally, these verbs have alternates in which the CAUSE role is absent. Though this is not attested for every one of these verbs in a given language, it holds cross-linguistically. Reinhart labels the operation that derives these alternates “[+c]-reduction”, for the specification of the thematic cluster being reduced.

As before, the THEME argument will be merged via *set-merge*, because it is a uniform [-] cluster. As such, it will also fail to qualify for argument externality (94). Therefore, the [+c]-reduced alternates of these verbs will invariably be unaccusative verbs. This is indeed borne out, as exemplified below with the Hebrew verb *nishbar* ‘break.PAST’.²³ The felicity of both “simple inversion” (101a) and modification by a possessive dative constituent (101b) shows that the subject of this predicate is indeed an internal argument (both constructions are described in detail in 2.1.1):

(101) a. *nishberu* [shtey cincanot]_{THEME} (Hebrew)

broke two jars

‘Two jars broke.’

b. *le-mi nishberu* [shtey cincanot]_{THEME}?

to-who broke two jars

‘Whose two jars broke?’

²³ The verb *nishbar* ‘break.PAST (intransitive)’ is the unaccusative alternate of *shavar* ‘break.PAST (transitive)’. Note that unlike English, Hebrew marks this alternation morphologically.

In addition, the fact that the THEME argument is *set-merged* means it should allow extraction at its base position, and like any other argument, block extraction when moved. This can be shown using the following contrast:

- (102) a. What₁ did there arise [a heated debate about t₁]_{THEME}?
b. ?? What₂ did [a heated debate about t₂]₁ arise [t₁]_{THEME}?

5.1.1.2. EXPERIENCER Objects

Examples: *annoy, worry, surprise, etc.*

The base entry for these verbs is a three-place entry (Pesetsky 1995; Reinhart 2001):

- (103) V: CAUSE ([+c]), EXPERIENCER ([-c +m]), SUBJECT MATTER ([-m])

Since CAUSE ([+c]) is a uniform [+] cluster, and EXPERIENCER ([-c +m]) qualifies for the [-c ±m] criterion, the verb's entry will have accusative Case:

- (104) V_{ACC}: CAUSE ([+c]), EXPERIENCER ([-c +m]), SUBJECT MATTER ([-m])

The SUBJECT MATTER argument will be merged via *set-merge*, because it is a uniform [-] cluster, while the CAUSE and EXPERIENCER arguments will be merged via *pair-merge*, because they are not uniform [-] clusters (see 3.2). The EXPERIENCER role is the only one that meets the condition for accusative Case checking (93).

Finally, the CAUSE role, which is *pair-merged*, is the only one that qualifies for argument externality (94). This is because the only other *pair-merged* argument is the EXPERIENCER, and as discussed above, the EXPERIENCER argument checks accusative, leaving the CAUSE argument as the only *pair-merged* argument that fails to check accusative Case.

As shown by Pesetsky (1995), these verbs cannot realize both the CAUSE and SUBJECT MATTER argument in a given derivation.²⁴ Therefore, each of the two possible configurations must be examined separately.

If the CAUSE argument is realized (along with the EXPERIENCER argument), then these verbs should surface with the CAUSE argument mapped externally, and the accusative EXPERIENCER argument mapped internally. If the SUBJECT MATTER argument is realized (along with the EXPERIENCER argument), then these verbs should surface with both the SUBJECT MATTER argument and the accusative EXPERIENCER argument mapped internally.

²⁴ This was explained by Reinhart (2001) in terms of Cluster Distinctness.

The latter option is exactly the case in (2), repeated below:

- (105) a. It worried [the children]_{EXP.} [that John was smoking]_{S.M.}.
b. hid'ig [et ha-yeladim]_{EXP.} [she-Dan me'ashen]_{S.M.} (Hebrew)
worried ACC the-children that-Dan smoking
'It worried the children that Dan was smoking.'

As shown in 2.1.1, both arguments are indeed internal in this derivation.

The other option (i.e. realizing the CAUSE role and not the SUBJECT MATTER role) is exemplified below:

- (106) a. [The doctor]_{CAUSE} worried [the patients]_{EXP.}.
b. [ha-rofe]_{CAUSE} hid'ig [et ha-xolim]_{EXP.} (Hebrew)
the-doctor worried ACC the-sick.PL
'The doctor worried the patients.'

Showing that the CAUSE argument is indeed external in this case requires some effort. This is because sentences such as (106) are inherently ambiguous, between interpreting the subject as a CAUSE and interpreting it as a SUBJECT MATTER (as first observed by Pesetsky 1995). In the more accessible reading, it is *the doctor* who causes *the patients* to worry (about something or other that is not specified in the sentence). However, another reading exists, where *the doctor* is what *the patients* were worried about (e.g. if the doctor was pale and looked like he was about to faint).

Many unaccusativity diagnostics simply check if a given argument can be internal, and since the aforementioned ambiguity exists, the subject of (106) will pass these tests by virtue of the speaker analyzing it as a SUBJECT MATTER argument. Therefore, one must try to force a CAUSE reading for the subject. Observe the following contrast:

- (107) a. ?? [His_i doctor's note]_{CAUSE} worried [every man_i]_{EXP.}.
b. [His_i mother's health]_{S.M.} worried [every boy_i]_{EXP.}.
(adapted from Reinhart 2001)

Analyzing the subject as a SUBJECT MATTER argument is easier in (107b) than in (107a). When the subject is forced to be a CAUSE argument (107a), it indeed behaves as an external argument, failing to participate in so-called "backward anaphora" (see 2.1.1.1).

In terms of extraction, CAUSE and EXPERIENCER are predicted to block extraction at their base position (since they are *pair-merged*), while SUBJECT MATTER should allow extraction at its base position (since it is *set-merged*). Observe the following contrast between the EXPERIENCER and SUBJECT MATTER roles:

(108) It worried [students of biology]_{EXP.} [that we ate red meat]_{S.M.}.

(109) a. What₁ did it worry [students of biology]_{EXP.} [that we ate t₁]_{S.M.}?

b. * [Which field]₁ did it worry [students of t₁]_{EXP.} [that we ate red meat]_{S.M.}?

The situation regarding the cause role is comparable to that which arises with THEME objects – see 5.1.1.1, above.

Since *Internal Merge* is *pair-merge*, the SUBJECT MATTER argument should become an island when it is moved. This is also borne out:

(110) a. [That we ate red meat]_{S.M.} worried [students of biology]_{EXP.}.

b. * What₁ (did) [that we ate t₁]_{S.M.} worry/worried [students of biology]_{EXP.}?

Like the verbs in 5.1.1.1, these verbs also have alternates in which the CAUSE ([+c]) role is absent. As discussed in (62) (of section 4.1), the derivational operation that creates these new entries reduces the verb's accusative Case. Therefore, the EXPERIENCER argument no longer has an accusative Case feature to check, and now qualifies as an external argument (this state of affairs is in sharp contrast with the CAUSE-less alternates of the verbs discussed in 5.1.1.1, which are unaccusatives).

The SUBJECT MATTER argument, if present, will be an internal argument, as before. The corresponding derivation is exactly the one in (3), repeated below:

(111) a. [The children]_{EXP.} worried ([that John was smoking]_{S.M.}).

b. [ha-yeladim]_{EXP.} da'agu ([she-Dan me'ashen]_{S.M.}) (Hebrew)

the-children worried that-Dan smoking

'The children worried (that Dan was smoking).'

As shown in 2.1.1, these mapping predictions above are indeed borne out – namely, the EXPERIENCER argument is external, and the SUBJECT MATTER argument is internal.

5.1.2. AGENT Subjects

5.1.2.1. AGENT Intransitives

Examples: *run, dance, jump, etc.*

The base entry for these verbs is a one-place entry:

(112) V: AGENT ([+c +m])

Despite the fact that AGENT ([+c +m]) is a uniform [+] cluster, there is no argument that qualifies for the [-c ±m] criterion. Therefore, the verb's entry will not have accusative Case.

The AGENT argument will be merged via *pair-merge*, because it is not a uniform [-] cluster (see 3.2). As such, it will be external (since it does not check accusative), meaning these verbs will be unergative:

- (113) a. [The boy]_{AGENT} danced.
 b. [ha-yeled]_{AGENT} rakad (Hebrew)
the-boy danced
 ‘The boy danced.’

The infelicity of both “simple inversion” (114a) and modification by a possessive dative constituent (114b) shows that the subject of this predicate is indeed an external argument (both constructions are described in detail in 2.1.1):

- (114) a. * rakdu [shney yeladim]_{AGENT} (Hebrew)
danced two children
 b. * le-mi rakdu [shney yeladim]_{AGENT?}
to-who danced two children

The AGENT should block extraction, due to its obligatory movement to TP, and this is indeed the case:

- (115) * [Which choreographer]₁ did [disciples of t₁]_{AGENT} dance?

5.1.2.2. THEME Objects

Examples: *eat, shave, dress, etc.*

The base entry for these verbs is a two-place entry:

- (116) V: AGENT ([+c +m]), THEME ([-c -m])

Since AGENT ([+c +m]) is a uniform [+] cluster, and THEME ([-c -m]) qualifies for the [-c ±m] criterion, the verb’s entry will have accusative Case:

- (117) V_{ACC}: AGENT ([+c +m]), THEME ([-c -m])

The THEME argument will be merged via *set-merge*, because it is a uniform [-] cluster, while the AGENT argument will be merged via *pair-merge*, because it is not a uniform [-] cluster (see 3.2).

Given the condition on accusative Case checking (93), it is the THEME argument that will check accusative. Therefore, the *pair-merged* AGENT argument will be external (since it does

not check accusative), and the *set-merged* THEME argument will be internal. These predictions are borne out:

(118) a. [The boy]_{AGENT} ate [an apple]_{THEME}.

b. [ha-yeled]_{AGENT} axal [et ha-tapuax]_{THEME} (Hebrew)
the-boy ate ACC the-apple
 ‘The boy ate the apple.’

In terms of extraction, the THEME argument is predicted to allow extraction at its base position. This is indeed borne out:

(119) [Which tree]₁ did you eat [apples from t₁]_{THEME}?

Finally, both the AGENT and the THEME should block extraction when moved. For the AGENT argument, its obligatory movement to TP achieves this effect. This is indeed the case:

(120) * [Which princess]₁ did [a friend of t₁]_{AGENT} eat a poison apple?

As for the THEME, the prediction regarding movement and islandhood can be tested via Heavy-NP Shift:

(121) a. I ate [t₁]_{THEME} yesterday [a wonderfully juicy apple from the neighbors’ tree]₁.

b. * [Which tree]₂ did you eat [t₁]_{THEME} yesterday [a wonderfully juicy apple from t₂]₁?

For discussion of alternations involving the addition/reduction of an AGENT role, see 5.2.

5.1.2.3. AGENT Ditransitives

Examples: *send, give, take, etc.*

The base entry for these verbs is a three-place entry:

(122) V: AGENT ([+c +m]), THEME ([-c -m]), GOAL/SOURCE/BENEFACTIVE ([-c])

Since AGENT ([+c +m]) is a uniform [+] cluster, and THEME ([-c -m]) qualifies for the [-c ±m] criterion, the verb’s entry will have accusative Case:

(123) V_{ACC}: AGENT ([+c +m]), THEME ([-c -m]), GOAL/SOURCE/BENEFACTIVE ([-c])

The THEME and GOAL/SOURCE/BENEFACTIVE arguments will be merged via *set-merge*, because they are uniform [-] clusters, while the AGENT argument will be merged via *pair-merge*, because it is not a uniform [-] cluster (see 3.2).

Given the condition on accusative Case checking (93), it is the THEME argument that will check accusative. Therefore, the *pair-merged* AGENT argument will be external (since it does not check accusative), while the other (*set-merged*) arguments will be internal. These predictions are borne out:

- (124) a. [The boy]_{AGENT} gave [the apple]_{THEME} [to the teacher]_{GOAL}.
 b. [ha-yeled]_{AGENT} natan [et ha-tapuax]_{THEME} [la-more]_{GOAL} (Hebrew)
the-boy gave ACC the-apple to.the-teacher
 ‘The boy gave the apple to the teacher.’

See 3.3.1 for a discussion of the extraction facts exhibited by these verbs.

5.1.3. Manner Verbs

Examples: *peel, cut, drill, etc.*

The base entry for these verbs is a three-place entry (see 4.3 for the relevant argumentation):

- (125) V: AGENT ([+c +m]), THEME ([-c -m]), INSTRUMENT ([+c -m])

Since AGENT ([+c +m]) is a uniform [+] cluster, and THEME ([-c -m]) qualifies for the [-c ±m] criterion, the verb’s entry will have accusative Case:

- (126) V_{ACC}: AGENT ([+c +m]), THEME ([-c -m]), INSTRUMENT ([+c -m])

The THEME argument will be merged via *set-merge*, because it is a uniform [-] cluster, while the AGENT and INSTRUMENT arguments will be merged via *pair-merge*, because they are not uniform [-] clusters (see 3.2). However, as argued in 4.3, only one of the latter two can be realized in a given derivation in languages such as English and Hebrew, which do not have instrumental Case. See 4.3 for a discussion of the state of affairs in Russian, a language that does have instrumental Case.

Given the condition on accusative Case checking (93), it is the THEME argument that will check accusative. Therefore, either the AGENT or the INSTRUMENT argument will be external (since accusative will be checked by the THEME), and the *set-merged* THEME argument will be internal. These predictions are borne out:

- (127) a. [The boy]_{AGENT} peeled [the apple]_{THEME}.
 b. [The knife]_{INSTRUMENT} peeled [the apple]_{THEME}.

- (128) a. [ha-yeled]_{AGENT} kilef [et ha-tapuax]_{THEME} (Hebrew)
the-boy peeled ACC the-apple
 ‘The boy peeled the apple.’
- b. [ha-sakin]_{INSTRUMENT} kilef [et ha-tapuax]_{THEME}
the-knife peeled ACC the-apple
 ‘The knife peeled the apple.’

In terms of extraction, the THEME argument is predicted to allow extraction at its base position. This is indeed borne out:

- (129) [Which tree]₁ did you peel [apples from t₁]_{THEME}?

Finally, both the AGENT or INSTRUMENT argument, and the THEME argument, should block extraction when moved. For the AGENT or INSTRUMENT argument, their obligatory movement to TP achieves this effect. This is indeed the case:

- (130) a. * [Which princess]₁ did [a friend of t₁]_{AGENT} peel the poison apple?
 b. * [Which blade]₁ did [a part of t₁]_{INSTRUMENT} peel the poison apple?

As for the THEME, the prediction regarding movement and islandhood can be tested via Heavy-NP Shift:

- (131) a. I peeled [t₁]_{THEME} yesterday [a wonderfully juicy apple from the neighbors’ tree]₁.
 b. * [Which tree]₂ did you peel [t₁]_{THEME} yesterday [a wonderfully juicy apple from t₂]₁?

5.1.4. Two-Place Unaccusatives

The case of one-place unaccusative verbs was discussed in 5.1.1.1. However, as Pesetsky (1995) and Reinhart (2002) point out, there is a set of unaccusative verbs that select two arguments. This set includes, among others, the following verbs: *appear*, *escape*, *appeal*, *elude*, *occur*, *belong*, *lack*, *miss*, *suffice*.

As argued by Reinhart (2002), these verbs do not have corresponding alternates that select an additional CAUSE role, unlike the verbs in 5.1.1.1. Therefore, the base entry for these verbs is a two-place entry:

- (132) V: THEME ([-c -m]), GOAL/EXPERIENCER/SOURCE/BENEFACTIVE ([-c])

Notice that the second role is a [-c] cluster, meaning a GOAL/SOURCE/BENEFACTIVE role. However, as discussed in 3.1, the /m feature is underspecified, hence the cluster is also compatible with an EXPERIENCER interpretation.

Since the thematic roles of the verb do not contain a uniform [+] cluster, the verb's entry will not have accusative Case.

Both arguments will be merged via *set-merge*, because they are uniform [-] clusters. Therefore, they will invariably be mapped as internal arguments, thus giving rise to the unaccusative nature of these verbs:

(133) It occurred [to me]_{GOAL(EXP.)} [that we might be late]_{THEME}.

Furthermore, since both arguments are merged via *set-merge*, they are predicted to allow extraction at their base positions, which is indeed the case:

(134) a. What_{t₁} did it occur to you [that John wanted t₁]_{THEME}?

b. [Which student]_{t₁} did it occur [to an advisor of t₁]_{GOAL} that the deadline was near?

Finally, as discussed in 3.4, an argument should block extraction when moved. Consider movement to TP:

(135) a. It escapes him [that we need her help]_{THEME}.

b. [A formulation of this argument]_{THEME} escapes me.

(136) a. [Whose help]_{t₁} does it escape him [that we need t₁]_{THEME}?

b. * [Which argument]_{t₁} does [a formulation of t₁]_{THEME} escape me?

5.2. Lexical Causatives

In 5.1.1, I discussed the behavior of verbs that select a CAUSE role. Cross-linguistically, these verbs have alternates without the CAUSE role (Reinhart 2000, 2002). When the role that remains is THEME, these alternates are unaccusative verbs (see 5.1.1).

There is another cross-linguistically attested alternation that may appear similar, and has sometimes been conflated with the alternation above (cf. Reinhart's (2000) comments on Pesetsky (1995)). This alternation involves the presence vs. absence of an AGENT role. Unlike the previous alternation, however, the alternates that lack the AGENT role are not unaccusative.

The following are examples of such an alternation:

(137) a. The soldiers marched to the mess hall.

b. The sergeant marched the soldiers to the mess hall.

(138) a. ha-xayalim ca'adu la-xeder-oxel (Hebrew)

the-soldiers marched to.the-room-food

‘The soldiers marched to the mess hall.’

b. ha-samal hic'id et ha-xayalim la-xeder-oxel

the-sergeant marched ACC the-soldiers to.the-room-food

‘The sergeant marched the soldiers to the mess hall.’

Crucially, the verbs in (137b, 138b) do not select a CAUSE role, as shown below:

(139) a. * Their hunger marched the soldiers to the mess hall.

b. * ha-ra'av shelahem hic'id et ha-xayalim la-xeder-oxel (Hebrew)

the-hunger GEN.3PL marched ACC the-soldiers to.the-room-food

Compare this with the CAUSE argument of verbs discussed in 5.1.1 (such as *break*):

(140) a. [John]/[the storm]/[the branch] broke the window.

b. The window broke.

(141) a. [Dan]/[ha-sufa]/[ha-'anaf] shavar et ha-xalon (Hebrew)

[Dan]/[the-storm]/[the-branch] broke ACC the-window

‘[Dan]/[the storm]/[the branch] broke the window.’

b. ha-xalon nishbar

the-window broke

‘The window broke.’

Notice that this phenomenon distinguishes these verbs from cases of syntactic causativization, by means of adding an additional predicate of causation. The latter do select a CAUSE role, as shown below:

(142) a. [The sergeant]/[their hunger] made the soldiers march to the mess hall.

b. [ha-samal] / [ha-ra'av shelahem] garam la-xayalim (Hebrew)

[the-sergeant]/ [the-hunger GEN.3PL] caused to.the-soldiers

lic'od la-xeder-oxel

march.INF to.the-room-food

‘[The sergeant]/[their hunger] made the soldiers march to the mess hall.’

Therefore, I will term the verbs in (137b, 138b) “lexical causatives”, as opposed to “syntactic causativization”, which is shown in (142).

So far, these facts suggest two separate derivational processes, one of which involves the reduction or addition of a CAUSE role, and the other involving the reduction or addition of an AGENT role.

This analysis was indeed proposed by Reinhart (2000, 2002). As discussed in 5.1.1, she proposes that the alternation in (140-141) involves reduction of a CAUSE role, while the alternation in (137-138) (i.e. “lexical causativization”) involves addition of an AGENT role.

Given this, one might assume that lexical causatives form a uniform class, modulo the aforementioned alternation. However, this is not the case.

As shown by Belikova and Preminger (2004), there is a collection of properties that split lexical causatives into two distinct groups. Crucially, these groups are the same for each of the given properties. I will discuss these properties below.

5.2.1. Dividing Properties

5.2.1.1. Extraction

Consider the lexical causatives *walk* and *feed*:

- (143) a. The visitors walked around campus.
b. The dean walked the visitors around campus.
- (144) a. The children ate.
b. The parents fed the children.

Interestingly, the two verbs pattern differently with respect to extraction from within the direct object. The lexical causative *walk* blocks extraction from its object (145), while the lexical causative *feed* (146) patterns with standard transitives such as *meet* (147), allowing extraction from its object:

- (145) a. * (The rector walked visitors from Harvard around the campus.)
[Which university]₁ did the dean walk [visitors from t₁] around campus?
b. * (The rector walked visitors from Harvard around the campus.)
[From which university]₁ did the dean walk [visitors t₁] around campus?
- (146) a. [Which parents]₁ did you feed [children of t₁]?
b. [Of which parents]₁ did you feed [children t₁]?

- (147) a. (I met visitors from Harvard,)
 [which university]₁ did you meet [visitors from t₁]?
 b. (I met visitors from Harvard,)
 [from which university]₁ did you meet [visitors t₁]?

The same state of affairs arises in Russian.²⁵ Once again, *ukhodit* ‘walk (causative)’ blocks extraction from its object (148), while *nakormit* ‘feed’ (149) patterns with standard transitives such as *vstretil* ‘meet’ (150), allowing extraction from its object.²⁶ Note that the following examples are from colloquial Russian.²⁷

- (148) * (Rektor ukhodil Garvardskikh gostej po kampusu, a) (Russian)
(rector walked Harvardian visitors around campus, and)
 [iz kakogo universiteta]₁ dekan ukhodil [gostej t₁] po kampusu?
from which university dean walked visitors around campus
- (149) (Ona nakormila detej iz podgotovitel’noj gruppy, a)
she fed children from kindergarten age-group, and
 [iz kakoj gruppy]₁ ty nakormila [detej t₁]?
from which age-group you fed children
 ‘(She fed children from the kindergarten age-group.) Which age-group did you feed children from?’
- (150) (ja vstretil gostej iz Garvarda, a)
I met visitors from Harvard, and
 [iz kakogo universiteta]₁ ty vstretil [gostej t₁]?
from which university you met visitors
 ‘(I met visitors from Harvard.) Which university did you meet visitors from?’

²⁵ Extraction from within NP’s in Russian seems to be constrained in the following way: it can only occur from within NP’s marked with structural Case. Note also that Russian is exceptional with regard to the Left Branch Condition (Ross 1986). Such examples are therefore avoided in the data. See Belikova and Preminger (2004) for more on extraction from NP’s in Russian.

²⁶ While the part in parenthesis makes (149) sound more natural, it does not influence grammaticality, since it cannot improve) 148(.

²⁷ The ungrammaticality of (148) does not stem from the colloquial nature of the verb. This can be shown by the fact that regular (non-causative) transitives in colloquial Russian allow extraction from their complement (assuming it does not trigger other unrelated violations).

These examples are not isolated. In fact, it seems that lexical causatives fall into two distinct groups, with respect to this behavior:

(151) Russian:²⁸

- a. Extraction blocked (walk-type lexical causatives):
ukhodit ‘walk [somebody] (till exhaustion)’
ubégat ‘run [somebody] (till exhaustion)’
utancevat ‘dance [somebody] (till exhaustion)’
uprygat ‘make [somebody] jump (till exhaustion)’
urabotat ‘work [somebody] (till exhaustion)’
- b. Extraction allowed (feed-type lexical causatives):
napoit ‘make [somebody] drink’
usadit ‘sit [somebody]’
ulozhit ‘lay [somebody]’
postavit ‘stand [somebody] up’
nakormit ‘feed’
vesti ‘make [somebody] go’
vyguljat ‘walk (dogs)’
ujti ‘make [somebody] go away ≡ fire [somebody]’

(152) English:

- a. Extraction blocked (walk-type lexical causatives):
walk, run, march, work, dance, gallop
- b. Extraction allowed (feed-type lexical causatives):
feed, lay, race

5.2.1.2. A Direct-Object Diagnostic: The Prepositional Quantifier *po* in Russian

Pesetsky (1982) points out that distributive *po*-phrases are limited to non-oblique VP-internal NPs, making this construction a syntactic diagnostic for unaccusativity in Russian (like genitive NPs under negation). This is shown in below:

²⁸ Interestingly, all the verbs in (151b) are from literary Russian, while all the verbs in (151a) are from colloquial Russian.

(153) a. Transitive:

Ja dal kazhdomu mal'chiku po jabloku (Russian)

I gave every boy PO apple.DAT

'I gave every boy a (different) apple.'

(from Pesetsky 1982)

b. Unaccusative:

Po jabloku upalo s kazhdogo dereva

PO apple.DAT fell from every tree

'A (different) apple fell from every tree.'

(from Babby 1980)

c. Unergative:

* V kazhdoy komnate smejalos' po devushke

in every room laughed PO girl.DAT

'A (different) girl laughed in every room.'

(from Harves 2002)

It should be pointed out that testing the *po*-construction with animate objects results in slightly reduced acceptability. All else being equal, (154a) (with an inanimate object) is perfectly grammatical, while the grammaticality of (154b) (with an animate object) is slightly reduced. However, this still stands in contrast with (153c), repeated as (154c), which is clearly ungrammatical:

(154) a. Inanimate:

kazhdyj student narisoval po jabloku (Russian)

every student drew PO apple.DAT

'Every student drew a (different) apple.'

b. Animate:

? kazhdyj student narisoval po devushke

every student drew PO girl.DAT

'Every student drew a (different) girl.'

c. Ungrammaticality (unergative verb):

* V kazhdoy komnate smejalos' po devushke

in every room laughed PO girl.DAT

'A (different) girl laughed in every room.'

(from Harves 2002)

Since all the objects of causative verbs are animate, one needs to be sensitive to the effect in (154b), and not mistake it for total ungrammaticality, of the kind in (154c).

Prima facie, one would expect the object of causative verbs to pattern with the object of transitives that take an animate object, such as (155):

- (155) ? Kazhdyj professor vstretil/proekzamenoval po (Russian)
every professor met/tested PO
 (odnomu) studentu
(one) student.DAT
 ‘Every professor met/tested one (different) student.’

However, only some lexical causatives display the expected behavior:

- (156) a. * Kazhdyj trener ubégal po (odnomu) sportsmenu (Russian)
every coach ran PO (one) athlete.DAT
 (po sport.ploshhadke)
(around field)
 ‘Every coach ran one (different) athlete (around the field).’
- b. * Kazhdaja iz nas utancevala po (odnomu) parnju (na vecherinke)
every from us danced PO (one) guy.DAT (at party)
 ‘Every one of us danced one (different) guy (at the party).’
- c. * Kazhdyj nachalnik s nashego zavoda (prosto)
every boss from our factory (simply)
 urabotal po (odnomu) rabotniku v etom godu
worked PO (one) employee.DAT in this year
 ‘Every boss in our factory (simply) worked one (different) employee this year (to exhaustion).’

- (157) ? Kazhdaja vospitatel’nica usadila/ulozhila/nakormila po (odnomu) rebjonku
every caretaker sat/laid/fed PO (one) child.DAT
 ‘Every caretaker sat/laid/fed one (different) child.’

The cases in (156) pattern with (153c). In other words, applying the *po*-construction to the object of the causative verbs in (156) is ungrammatical, on par with its application to the subject of unergative verbs. In contrast, the cases in (157) pattern with (155) – namely, application of the *po*-construction to their object is only slightly odd, on par with its applicability to the animate object of a transitive verb.

Crucially, this distinction seems to split lexical causatives in Russian along the exact same lines as the extraction diagnostic does – namely:

- (158) a. Type I (*walk-type*) lexical causatives:
 (i) block extraction from their object
 (ii) do not allow the *po*-construction
 b. Type II (*feed-type*) lexical causatives:
 (i) allow extraction from their object
 (ii) allow the *po*-construction
 (see 5.2.1.1 for the list of verbs in each group)

5.2.1.3. Entailments

The simplest conceivable semantics of causatives would probably include an element denoting causation, coupled with an element that is comparable to the event e_v , denoted by the original verb (pre-causativization).

This raises the question of whether or not e_v is in fact an entailment of causative verbs. In other words, whether the occurrence of the caused event is part of the causative verb's truth conditions.

Once again, it seems that lexical causatives do not fall into one category:

- (159) a. # The coach ran the athletes (around the field) but the athletes did not run.
 b. # trener ubégal sportsmenov (po sport.ploshhadke) (Russian)
coach ran athletes (around field)
 no oni ne begali/pobezhali
but they NEG ran.IMPRF/ran.PRF
 'The coach ran the athletes (around the field), but they did not run.'
- (160) a. John fed the baby but the baby did not eat.
 b. Ivan kormil rebjonka no rebjonok ne el (Russian)
Ivan fed baby but baby NEG ate
 'Ivan fed the baby, but the baby did not eat.'

This diagnostic seems to split lexical causatives along the same lines as the extraction diagnostic (5.2.1.1), and in Russian, the *po*-construction (5.2.1.2) – namely:

- (161) a. Type I (*walk*-type) lexical causatives:
- (i) block extraction from their object
 - (ii) do not allow the *po*-construction (in Russian)
 - (iii) carry the entailment of e_v
- b. Type II (*feed*-type) lexical causatives:
- (i) allow extraction from their object
 - (ii) allow the *po*-construction (in Russian)
 - (iii) do not carry the entailment of e_v
- (see 5.2.1.1 for the list of verbs in each group)

5.2.1.4. Suppletive Morphology

Certain lexical causative alternations exhibit suppletive morphology. For example:

- (162) a. *eat* – *feed*
- b. *kormit* ‘feed’ – *est* ‘eat’ (Russian)
- c. *vesti* ‘make [somebody] go’ – *khodit* ‘go’

The distribution of suppletive morphology within the class of lexical causatives correlates to the properties discussed in 5.2.1.1-5.2.1.3. Specifically, suppletive morphology is restricted to the sub-class labeled *Type II*.

This is especially surprising, given the size and productivity of the other sub-class of lexical causatives, *Type I*. In Russian, the process that forms *Type I* causatives (usually prefixation of /*u-*/) is highly productive, yet no cases of suppletive morphology exist within this sub-class.

Thus, the emergent generalizations, so far, are as follows:

- (163) a. Type I (*walk*-type) lexical causatives:
- (i) block extraction from their object
 - (ii) do not allow the *po*-construction (in Russian)
 - (iii) carry the entailment of e_v
 - (iv) never exhibit suppletive morphology

- b. Type II (feed-type) lexical causatives:
- (i) allow extraction from their object
 - (ii) allow the *po*-construction (in Russian)
 - (iii) do not carry the entailment of e_v
 - (iv) may exhibit suppletive morphology
- (see 5.2.1.1 for the list of verbs in each group)

5.2.1.5. Semantic Drift

Some lexical causatives have slightly altered, non-predictable meaning, relative to the verbs from which they were derived. For example, the lexical causative derived from the Russian *ujti* ‘go away’ means ‘fire [somebody]’ and not just ‘make [somebody] go away’.

Similarly, while the agent of the Russian *guljat* ‘walk’ must be realized by a noun-phrase whose head is a [+human] noun, the object of the derived causative, *vyguljat*, must be realized by a noun-phrase whose head is [+animate] [- human]. Not surprisingly, a metaphoric or ironic use is possible (double question marks, and not an asterisk, are therefore used):

- (164) a. *Rebjonok/(??)sobaka guljaet* (Russian)
child/(??)dog walks
 ‘The child/dog walks.’
- b. *Ja vygulivaju (??)rebjonka/sobaku*
I walk (??)child/dog
 ‘I walk the child/dog.’

It is also notable that *nakormit* ‘feed’ and *napoit* ‘make [somebody] drink’ are often interpreted as just ‘give food/drinks [to somebody]’, respectively.

Crucially, all these cases occur within sub-class of lexical causatives labeled *Type II*. Thus, the emergent generalizations are as follows:

- (165) a. Type I (walk-type) lexical causatives:
- (i) block extraction from their object
 - (ii) do not allow the *po*-construction (in Russian)
 - (iii) carry the entailment of e_v
 - (iv) never exhibit suppletive morphology
 - (v) never exhibit semantic drift

- b. Type II (feed-type) lexical causatives:
- (i) allow extraction from their object
 - (ii) allow the *po*-construction (in Russian)
 - (iii) do not carry the entailment of e_v
 - (iv) may exhibit suppletive morphology
 - (v) may exhibit semantic drift
- (see 5.2.1.1 for the list of verbs in each group)

5.2.2. Analysis

5.2.2.1. General

Reinhart (2002) analyzes the lexical causativization process as consisting of two steps:

(166) Lexical Causative Formation: (adapted from Reinhart 2002)

- a. *agentivization*: adding an AGENT role to the original verbs thematic grid
 $V: \theta(\text{AGENT}) \rightarrow \text{Causative}(V): \theta(\text{AGENT}) \theta(\text{AGENT})$
- b. *disempowerment*: change original AGENT to EXPERIENCER
 $\text{Causative}(V): \theta(\text{AGENT}) \theta(\text{AGENT}) \rightarrow \text{Causative}(V): \theta(\text{AGENT}) \theta(\text{EXPERIENCER})$

However, given that these two steps are indeed distinct, one would expect to find cases where one has taken place without the other.

This is precisely the proposal made by Belikova and Preminger (2004): *Type I*, or *walk*-type lexical causatives, are verbs that have undergone *agentivization* (166a), but not *disempowerment* (166b). *Type II*, or *feed*-type lexical causatives, are verbs that have undergone both *agentivization* (166a) and *disempowerment* (166b).

Furthermore, Belikova and Preminger argue that the EXPERIENCER role mentioned in (166b) is in fact a conflation of the [+animate] nature of the unchanged AGENT role, with the true nature of the resulting thematic role, GOAL/BENEFACTIVE. In Reinhart's (2000) terms, the EXPERIENCER ([-c +m]) role is a result of fusion of the /+m feature associated with the AGENT ([+c +m]) role in (166a) with the /-c feature associated with the GOAL/BENEFACTIVE ([-c]) role.²⁹

²⁹ Reinhart (2000) herself states that the GOAL role is compatible with an EXPERIENCER interpretation (this follows from the fact that the /m feature is underspecified in the GOAL cluster, [-c]), and that in addition, so-called "fluctuation" between the two roles is attested.

Thus, lexical causativization can be reformulated as follows:

(167) Lexical Causative Formation: (Belikova & Preminger 2004)

a. *agentivization*: adding an AGENT role to the original verbs thematic grid

V: $\theta(\text{AGENT}) \rightarrow \text{Causative}_{\text{walk-type}}(\text{V}): \theta(\text{AGENT}) \theta(\text{AGENT})$

output: *Type I (walk-type)* lexical causatives

b. *disempowerment*: change original AGENT to GOAL/BENEFACTIVE

$\text{Causative}_{\text{walk-type}}(\text{V}): \theta(\text{AGENT}) \theta(\text{AGENT}) \rightarrow$

$\text{Causative}_{\text{feed-type}}(\text{V}): \theta(\text{AGENT}) \theta(\text{GOAL/BENEFACTIVE})$

output: *Type II (feed-type)* lexical causatives

5.2.2.2. Thematic Diversity

One question immediately raised by the formulation of *agentivization* (167a) is that of realizing a given thematic role more than once on the same predicate (in this case, the AGENT role). Pesetsky (1995) proposes the following constraint:

(168) Thematic Diversity: (adapted from Pesetsky 1995)

A specific thematic role cannot be realized more than once on the same predicate

The output of *agentivization* (167a) is an obvious violation of (168). However, if thematic roles are two-place relations between events and arguments (as often assumed in current literature), it is reasonable to assume that distinctness has to do with events, rather than predicates. Therefore, (168) should be reformulated as follows:

(169) Thematic Diversity: (modified)

A specific thematic role cannot be realized more than once on the same *event*

Given (169), co-arguments of the same predicate that relate to separate events may be indistinct. Parsons (1990) has argued, independently of the issue of Thematic Diversity, that the semantics of a causative verb contains two events – the event of causation, and the event corresponding to the action that was caused (e_v , in the current notation). The absence of entailment in *feed-type* lexical causatives (5.2.1.3) may provide further support for the idea that these events are in fact separable, in the sense that the former can take place without the latter.³⁰

³⁰ Of course, the fact that e_v does not necessarily take place does not mean it is not part of the semantics of the sentence. Similar situations arise with modal and negation operators, where the event in the scope of the operator need not take place in order for the sentence to be true.

The two AGENT roles in (167a) obviously correspond to different events – one corresponds to the event of causation, and the other to e_v . Therefore, (167a) does not represent a violation of Thematic Diversity. A possible semantics for *walk*-type lexical causatives is given below:

$$(170) \exists e_c \left(Agent(e_c, arg_1) \wedge \exists e_v \left(walk(e_v) \wedge cause(e_c, e_v) \wedge Agent(e_v, arg_2) \right) \right)$$

Let us now examine the consequences of such an analysis, in terms of the properties discussed in 5.2.1.

5.2.2.3. Extraction

Given the proposal in section 3, an AGENT role should block extraction at its base position. This is because it is not a uniform [-] cluster, and is therefore *pair-merged* at its base position. In contrast, a GOAL/BENEFACTIVE role is a uniform [-] cluster, which is *set-merged* at its base position, and therefore predicted to allow extraction at its base position.

Consider once again the data in 5.2.1.1 ((145-146) and (148-149), repeated below):

(171) a. * (The rector walked visitors from Harvard around the campus.)

[Which university]₁ did the dean walk [visitors from t₁] around campus?

b. * (The rector walked visitors from Harvard around the campus.)

[From which university]₁ did the dean walk [visitors t₁] around campus?

(172) a. [Which parents]₁ did you feed [children of t₁]?

b. [Of which parents]₁ did you feed [children t₁]?

(173) * (Rektor ukhodil Garvardskikh gostej po kampusu, a)

(rector walked Harvardian visitors around campus, and)

[iz kakogo universiteta]₁ dekan ukhodil [gostej t₁] po kampusu?

from which university dean walked visitors around campus

(174) (Ona nakormila detej iz podgotovitel'noj gruppy, a)

she fed children from kindergarten age-group, and

[iz kakoj gruppy]₁ ty nakormila [detej t₁]?

from which age-group you fed children

‘(She fed children from the kindergarten age-group.) Which age-group did you feed children from?’

The verbs in (171) and (173) are *Type I* (*walk*-type) lexical causatives, and their object is therefore an AGENT (of the caused event, e_v). Its islandhood is therefore predicted by the proposal in section 3. Similarly, the verbs in (172) and (174) are *Type II* (*feed*-type) lexical

causatives, and their object is therefore a GOAL/BENEFACTIVE. It is therefore predicted to allow extraction.

5.2.2.4. The Prepositional Quantifier *po* in Russian

As discussed in 5.2.1.2, the *po*-construction in Russian can be applied to *Type II* (*feed*-type) lexical causatives, but not to *Type I* (*walk*-type) lexical causatives. It is encouraging in itself that the *po*-construction would distinguish between the two types of lexical causatives hypothesized here, but let us examine why this difference would arise.

Recall that Pesetsky (1982) defines the environment for the *po*-construction to be a non-oblique VP-internal noun-phrase. In both types of lexical causatives, the object meets this condition – so it seems that the condition needs to be revised.

Consider that the condition is in fact the following:

(175) The *po*-construction can be applied to non-oblique *set-merged* noun-phrases

This would correctly predict the behavior with respect to the proposed typology of causatives. Within the framework developed here, this makes the following further prediction: the *po*-construction should also be infelicitous with an EXPERIENCER argument (because EXPERIENCER, [-c +m], is not a uniform [-] cluster, and is therefore *pair-merged*).

This prediction is indeed borne out:

- (176) a. * Kazhdaja statja vzvolnovala po (odnomu) roditelju (Russian)
every article worried PO (one) parent
 ‘Every article worried one (different) parent.’
- b. * Kazhdyj doctor vzvolnoval po (odnomu) roditelju
every doctor worried PO (one) parent
 ‘Every doctor worried one (different) parent.’

5.2.2.5. Entailments

Recall the semantics of *walk*-type lexical causatives, given in (170), and repeated below:

(177) $\exists e_c \left(Agent(e_c, arg_1) \wedge \exists e_v \left(walk(e_v) \wedge cause(e_c, e_v) \wedge Agent(e_v, arg_2) \right) \right)$

As discussed in 5.2.2.2, the existence of two separate events follows Parsons' (1990) analysis of the semantics of causatives, and is a necessary condition for avoiding a violation of Thematic Diversity (169) (i.e. the ban on realizing a specific thematic role twice on a given

event). This is because the AGENT of the causation event is added to the predicate's thematic grid, while the AGENT of the caused event (e_v) remains.

In *feed*-type lexical causatives, however, an additional process has taken place. This process is *disempowerment* (167b), which changes the AGENT of e_v to a GOAL/BENEFACTIVE role. Since the identity of thematic roles has been eliminated, it is conceivable that the semantics of *feed*-type lexical causatives does not require two separate events. The event of causation, e_c , is obviously necessary, since the thematic grid contains a role that relates to the causation (the AGENT role). However, e_v no longer needs to exist as an independent event. A possible semantics for *feed*-type lexical causatives is given below:

$$(178) \exists e_c \left(Agent(e_c, arg_1) \wedge (causative(eat))(e_c) \wedge Goal(e_c, arg_2) \right)$$

(where *causative(eat)* is essentially “feed”)

The difference in entailments between the two types of lexical causatives, discussed in 5.2.1.3, can now be reduced to whether or not the semantics explicitly calls for the existence of the caused event, e_v . When this event is part of the semantics, the entailment of e_v holds (as in *walk*-type lexical causatives), and when it is not, the entailment does not hold (as in *feed*-type lexical causatives).

5.2.2.6. Suppletive Morphology and Semantic Drift

As of this point, there is no clear explanation for why suppletive morphology and semantic drift would be restricted to *walk*-type lexical causatives.

One difference is that only the process that derives *feed*-type lexical causatives involves changing the nature of one of the thematic roles involved (i.e. changing the original AGENT to a GOAL/BENEFACTIVE), while the process that derives *walk*-type lexical causatives only adds a new role (AGENT) to the thematic grid. However, it is not immediately clear how this distinction could be correlated to the phenomena at hand. Some transitive-unaccusative pairs display suppletive morphology (e.g. *kill* - *die*; Montrul 2001), and this alternation involves only addition/reduction of a thematic role, without changing the nature of a role on the thematic grid. Similarly, there are adjectival passives that display semantic drift (e.g. *relate* (*v.*) - *related* (*adj.*); Horvath & Siloni 2005), and this process also involves reduction of a thematic role, without changing the nature of a role on the thematic grid.

Thus, while suppletive morphology and semantic drift do split lexical causatives along the correct lines (in terms of the analysis proposed in 5.2.2.1), why they do so remains an open question.

6. Eliminating Externality as a Primitive

Until this point, I have regarded argument externality as a theoretical primitive, developing an account for its distribution, which I showed to be empirically superior to existing accounts (see sections 2 and 4.2).

However, one might ask whether the notion of *argument externality* is necessarily a theoretical primitive, or perhaps derivable from existing principles. The current proposal may prove beneficial in eliminating the need for externality as a theoretical primitive altogether. This section examines this possibility.

6.1. Order of Merger

In the previous sections, I have dealt with the type of syntactic merger that attaches arguments to the syntactic derivation, but not with the order in which these merger operations occur. This sub-section will deal with the latter issue.

I will be assuming a bottom-up theory of structure-building (Chomsky 1995a), at least as far as phase-internal structure-building operations are concerned. Nothing in the current sub-section is contingent on this assumption, but it will be crucial for the rest of section 6. Therefore, to be consistent, I will phrase the observations in this sub-section according to the same point of view. This means that if constituent α is merged *before* constituent β , it will be hierarchically *lower* in the phrase-marker, and vice-versa.

It is evident that the order of argument merger is often constrained:

(179) * hid'ig [et ha-manyak_i]_{EXP.} [she-Dina dibra 'im Dan_i]_{S.M.} (Hebrew)
worried ACC the-bastard that-Dina spoke with Dan

The ungrammaticality of (179) is obviously the result of a Condition C violation between the epithet *ha-manyak* 'the bastard' and the R-expression *Dan*. However, it also shows that the order in which the two bracketed arguments are merged with the verb is rigid. If the

epithet could have been merged before the CP, it would not c-command into the clause, and the Condition C violation would be obviated.³¹

This is not always the case. There are situations where two internal arguments can be merged in either order:

(180) a. Yosi hexzir [kol kelev_i]_{THEME} [la-be'alim shel_{o_i}]_{GOAL} (Hebrew)
Yosi returned every dog to.the-owner his
 ‘Yosi returned every dog to its owner.’

b. Yosi hexzir [le-kol yeled_i]_{GOAL} [et ha-kelev shel_{o_i}]_{THEME}
Yosi returned to-every child ACC the-dog his
 ‘For every child, Yosi returned that child’s dog to him.’

The difference between (180a) and (180b) is not merely a variation in word order. As shown by the variable-binding relations in each case, the hierarchical relations between the bracketed internal arguments in (180b) are actually the opposite of those in (180a). If the variation in (180a-b) is indeed the result of variation in the order of merger, this hierarchical contrast is to be expected.

Similar evidence can be found in the domain of multiple-wh questions with pair-list readings. As has been well-established in the literature (Chomsky 1993; Frampton 1991; Lasnik & Saito 1992), movement of wh-elements to the periphery of CP in English pair-list questions exhibits a robust superiority effect, as evinced by the contrast in (181a-b):

(181) a. Who₁ does Bill think t₁ bought what?
 b. * What₁ does Bill think (that) who bought t₁?

The same effect arises in Hebrew:³²

(182) a. mi₁ Dan xoshev she-(t₁)-kana ma? (Hebrew)
who Dan thinks that-bought what
 ‘Who does Dan think bought what?’

³¹ Notice that the inverse linear order is simply unavailable, regardless of binding effects:

(i) * hid'ig [she-Dina dibra 'im Dan]_{S.M.} [et Rina]_{EXP.} (Hebrew)
worried that-Dina spoke with Dan ACC Rina

This is not due to adjacency effects between the verb *hid'ig* ‘worried’ and the accusative-marked argument. As shown in (180) and (185), these effects do not occur in Hebrew.

³² As evinced by the grammaticality of (182a), Hebrew does not exhibit so-called “That-Trace” Effects, and its declarative complementizer is in fact obligatorily overt in most contexts.

- b. * ma₁ Dan xoshev she-mi kana t₁?
what Dan thinks that-who bought

However, when testing the post-verbal arguments of ditransitive verbs such as *hexzir* ('returned') (the same verb used in (180a-b)), these superiority effects seem to disappear:

- (183) a. [et ma]₁ Dan xashav she-hexzarta t₁ le-mi? (Hebrew)
ACC what Dan thought that-returned.2SG to-who
 'What did Dan think that you returned to whom?'
 b. [le-mi]₁ Dan xashav she-hexzarta t₁ et ma?
to-whom Dan thought that-returned.2SG ACC what
 'To whom did Dan think that you returned what?'

Normally, the felicity of both (183a) and (183b) would be proclaimed as a case of so-called "equidistance" – a notion that is independently problematic, given *Binary Branching* (Kayne 1984). However, just as in (180a-b), this behavior is to be expected if the two arguments in question can be merged in either order. Thus, the data in (183a-b) can be afforded the same explanation as the variable-binding facts shown above, without recourse to the notion of "equidistance".

Note that the choice of Hebrew rather than English for the examples in this sub-section is not arbitrary. English has an unrelated adjacency requirement on accusative Case assignment (Chomsky 1981; Stowell 1981), as can be seen below:

- (184) John sent (*yesterday) letters to Mary.

The same constraint does not exist in Hebrew:

- (185) Yosi natan (etmol) et ha-xoveret le-Dina (Hebrew)
Yosi gave yesterday ACC the-booklet to-Dina
 'Yosi gave the booklet to Dina (yesterday).'

This has been explained in terms of the locus of Case checking (Neeleman & Reinhart 1997; Siloni 2001): in English, accusative Case is checked at PF, where the relevant relation is linear adjacency, whereas Hebrew checks accusative Case in syntax, where the relevant relation is a structural/hierarchical one.

As a result, the variation that was shown in (180a-b) for Hebrew, does not exist in English:

- (186) a. John returned [every dog_i]_{THEME} [to its_i owner]_{GOAL}.
 b. * John returned [to every child_i]_{GOAL} [his_i dog]_{THEME}.

Given the analysis above, this has nothing to do with constraints on order of merger. Rather, it is a result of the fact that English checks accusative Case at PF, and so the verb (*returned*) must be linearly adjacent to its accusative-marked argument (*his dog*).³³

Returning to examples (179-180), they show that SUBJECT MATTER ([-m]) arguments must be merged before EXPERIENCER ([-c +m]) arguments, while the merging order of THEME ([-c -m]) and GOAL ([-c]) arguments is free. Given the current proposal, the thematic roles of SUBJECT MATTER, THEME, and GOAL form a natural class, to the exclusion of the EXPERIENCER role: the latter is not a uniform [-] cluster, while the others are. This means the EXPERIENCER argument is merged into the derivation via *pair-merge*, while the others are merged via *set-merge*.

To phrase the observation in these terms, (179-180) suggest that *set-merged* arguments must be merged before *pair-merged* arguments, while amongst themselves, *set-merged* arguments can be merged in any order.

It would be desirable to test this generalization for every possible pair of *set-merged* thematic roles, and every possible pair of a *set-merged* thematic role and a *pair-merged* thematic role. Unfortunately, these are difficult to construct. This is because whenever one of these is the subject, its eventual movement to TP confounds the relevant hierarchical facts.

³³ It may be possible to obtain some indirect evidence for this freedom of order from English as well. Consider the following data:

- (i) a. * [Which boy_i]₁ does his_i teacher like t₁?
- b. [Which boy_i]₁ t₁ was offended t₁ by his_i teacher?
- (ii) a. * [Which boy_i]₁ did his_i teacher introduce [t₁]_{THEME} [to the principal]_{GOAL}?
- b. * [Which boy_i]₁ did his_i teacher introduce [the principal]_{THEME} [to t₁]_{GOAL}?
- c. [Which teacher_i]₁ did the principal introduce [t₁]_{THEME} [to his_i students]_{GOAL}?
- d. ? [Which teacher_i]₁ did the principal introduce [his_i students]_{THEME} [to t₁]_{GOAL}?

Cases (i.a-i.b) represent the standard contrast between active sentences and verbal passives, in terms of Weak Crossover. As for ditransitive constructions, (ii.a-ii.b) can be taken as a baseline, exhibiting Weak Crossover effects that arise from the appearance of a pronoun with bound-variable reading in subject position (on par with (i.a)). Assuming (ii.d) is indeed better than (ii.a-ii.b), this could be taken as evidence that the aforementioned V-NP_{ACC} adjacency is achieved via movement, and underlyingly, both merging orders of the THEME and GOAL are actually possible.

However, Hebrew may allow covert checking of nominative Case (without overtly moving the subject to TP), as suggested by the “untriggered inversion” structure (Reinhart & Siloni 2005; Shlonsky 1987).

Observe the following cases from Hebrew:

(187) AGENT ([+c +m], pair-merged) and THEME ([-c -m], set-merged):

- a. [kol yeled_i]_{AGENT} lavash [et ha-xulca shelo_i]_{THEME} (Hebrew)
every child wore ACC the-shirt his
 ‘Every child wore his shirt.’
- b. * [ha-me’acev shelo_i]_{AGENT} lavash [kol beged_i]_{THEME}
the-designer his wore every garment

(188) CAUSE ([+c], pair-merged) and THEME ([-c -m], set-merged):

- a. [kol yeled_i]_{CAUSE} shavar [et ha-bakbuk shelo_i]_{THEME} (Hebrew)
every child broke ACC the-bottle his
 ‘Every child broke his bottle.’
- b. * [ha-yocer shelo_i]_{CAUSE} shavar [kol pesel_i]_{THEME}
the-creator his broke every statue

(189) AGENT ([+c +m], pair-merged) and GOAL ([-c], set-merged):

- a. [kol yeled_i]_{AGENT} halax [le-‘ima shelo_i]_{GOAL} (Hebrew)
every child walked to-mother his
 ‘Every child went to his mother.’
- b. * [ha-ben shela_i]_{AGENT} halax [le-kol ‘ima_i]_{GOAL}
the-son her walked to-every mother

(190) INSTRUMENT ([+c -m], pair-merged) and THEME ([-c -m], set-merged):

- a. [kol sakin_i]_{INSTR.} xatax [et ha-tik shel be’alav_i]_{THEME} (Hebrew)
every knife cut ACC the-bag of owner.his
 ‘Every knife cut its owner’s bag.’
- b. * [ha-sakin shelo_i]_{INSTR.} xatax [kol ‘adam_i xamush]_{THEME}
the-knife his cut every person armed

Normally, cases such as (187-190) are taken as evidence for the structural prominence of external arguments. However, given the option of leaving a nominative-marked argument in-situ (in its VP-internal position), it is not clear what would derive this structural prominence, other than rigidity in merging order. More importantly, note that an analysis in terms of merging order (rather than the external/internal distinction) affords the structural

asymmetry in (187-190) the same analysis as the structural asymmetry in (179) – despite the fact that (179) has no external arguments at all.

Therefore, instead of an account based on *argument externality*, which would derive (187-190) but fail to account for the difference between (179) and (180), the facts suggest an account based on ordering of merger operations:

(191) Constraint on Order of Merger:

Merge *pair-merged* arguments only after *set-merged* arguments have been exhausted.

6.2. Deconstructing Externality

Before turning to the main goal of section 6 – an attempt to eliminate *argument externality* as a theoretical primitive – one must be clear regarding exactly which properties are associated with argument externality. It seems to me that there are (at least) three such properties:

(192) a. EPP's "first choice"

Both external and internal arguments can be subjects – the argument attracted to TP to check the EPP.³⁴ However, if a verb has an external argument, it will necessarily be the one to check the EPP, preempting the choice of an internal argument for movement to subject position.

b. Externality Diagnostics

There are many diagnostics that are presumed to distinguish external arguments from internal arguments. These diagnostics are varied and often language-specific. Some examples include: Romance *en/ne*-cliticization (Belletti & Rizzi 1981; Burzio 1986; Cinque 1990), and the Hebrew possessive dative construction (Borer & Grodzinsky 1986).

In many cases, the literature contains no explicit account for why these diagnostics distinguish external arguments from internal arguments – that is, what is it about *argument externality* that interacts with the syntactic operation involved in the diagnostic, giving rise to the observed contrast. Rather, the results of the diagnostic are shown to differ when applied to each argument of a canonical two-place

³⁴ Here and throughout, I use the general terminology “checking the EPP” to refer to movement of a constituent to Spec-T⁰ to check the EPP-feature and receive nominative Case.

transitive verb, with the subjects of unergatives patterning with the subjects of transitives, and the subjects of unaccusatives and passives patterning with the object of transitives.

c. Linearization to the Left of V^0

In a language like English, a constituent that has been moved to TP should be linearized to the left of V^0 , by virtue of the linearization of SpecTP to the left of T^0 and its complement, without further assumptions.

Hebrew, however, allows indefinite arguments of unaccusative verbs, but not the arguments of unergative intransitives, to surface post-verbally in the so-called “untriggered inversion” structure (Reinhart & Siloni 2005; Shlonsky 1987).

If “untriggered inversion” is evidence that Hebrew can check nominative Case covertly (without overtly moving the argument to TP), then even the VP-internal linearization of external arguments is necessarily to the left of V^0 (unlike internal arguments, which are linearized to the right of V^0 , thus creating the “inversion” effect).³⁵

Similarly, in English, external arguments disallow expletive-insertion (a construction that places the relevant argument to the right of V^0), as shown below:³⁶

- (i) ? There arrived a man.
- (ii) * There ran a man.

If one accepts that the expletive-associate construction actually represent the head and tail of an A-chain (between the argument’s base position and the subject position), such a construction would require the argument’s base position to be to the right of V^0 . This is evidently only possible for internal arguments.

6.3. Deriving Externality

In this sub-section, I will attempt to show how the account for the distribution of externality, which was developed in the previous sections, can be useful in deriving the properties of externality itself, which were outlined in (192a-c), above.

³⁵ The current discussion is restricted to SV(O) languages.

³⁶ A short, phonologically “light” noun-phrase (*a man*) is used in these examples to neutralize potential Heavy-NP Shift effects.

6.3.1. Checking the EPP

Consider the property in (192a) – being the first choice for checking the EPP.

Let $\Gamma = \{\text{all instances of Case available on the verb}\}$. The following is an obvious requirement for a convergent derivation:

(193) $|\Gamma| + 1$ must equal the number of arguments that the verb has in the derivation

(The additional Case, not included in Γ , is the nominative Case on T^0 .)

Recall that nominative Case is checked along with the EPP. Given (193), this means that when T^0 , the EPP-bearing head, is merged into the derivation, there must be exactly one argument that has not checked Case yet. Assuming syntactic features, including Case, are checked as soon as possible, it follows that the argument that has not checked Case will be the last argument merged into the derivation.

Next, recall the conclusions reached in 6.1, regarding the order of merger of arguments, and specifically (191), repeated below:

(194) Constraint on Order of Merger:

Merge *pair-merged* arguments only after *set-merged* arguments have been exhausted.

It follows that, in general, the last argument merged into the derivation will be a *pair-merged* argument (if the verb has one), and this will be the argument that ends up checking the EPP.

However, there are clear exceptions to this generalization:

First, as shown in section 4, VP-internal types of Case, and specifically accusative, are thematically discriminating. Thus, it may be that a verb has both *set-merged* and *pair-merged* arguments, but the *set-merged* arguments are thematically incompatible with accusative Case (despite being merged first). This will result in accusative Case-checking being deferred until the (thematically compatible) *pair-merged* argument is merged.

When T^0 is merged into the derivation, the *pair-merged* argument will indeed be closer to the EPP-feature, in hierarchical terms. However, all of its ϕ -features will already have been checked, rendering it “inactive” (in Chomsky's (2001) terms), and effectively invisible to the EPP-feature.³⁷ This provides an explanation for the observation made in sections 2-4, that

³⁷ At first glance, one might expect that such an argument, which has checked Case, will still give rise to intervention effects (in more traditional terminology, violations of Relativized Minimality; Rizzi 1990). However, Chomsky (2004) argues that intervention effects can only hold across phases – in other words, a probe can find any matching (active) goal in the phase that it heads.

VP-internal Case-assignment precludes external mapping of an argument – even if the argument in question is one that can be external under other circumstances (i.e. an argument belonging to the group of *B-arguments*; see 2.3).

Second, a verb may simply lack *pair-merged* arguments altogether (when all its thematic roles are uniform [-] clusters). In this case, it is also obvious that the argument chosen to check the EPP will be a *set-merged* argument. These are precisely the cases that are traditionally referred to as having an unaccusative derivation – or in alternative terms, an internal argument that moves to subject position.

Now recall the definition of externality in (88), repeated below:

(195) External Argument (generalized version):

A pair-merged argument that does not check Case VP-internally.

These two exceptions to the aforementioned generalization (that a *pair-merged* argument will end up checking the EPP) are precisely the cases where an argument that satisfies (195) does not exist. In other words, whenever an argument that satisfies (195) exists, it will be chosen to check the EPP.

To summarize, the definition of externality proposed earlier is not only empirically superior, but together with the conclusions in sections 4 and 6.1, it allows the first property associated with externality (192a) to be derived.

6.3.2. Externality Diagnostics

The range of diagnostics that distinguish external arguments from internal arguments is too wide to cover here. However, there is one point that warrants mentioning, with regard to a theoretical evaluation of the current proposal.

As mentioned in (192b), in many cases, the literature does not explain what it is about argument externality that interacts with the syntactic operation involved in a specific diagnostic, giving rise to the external/internal contrast. This is perhaps the result of what is currently a somewhat poor understanding of the concept of *argument externality* in general.

When the literature does not present a way to reduce the divergent behavior of external and internal arguments (with respect to a given diagnostic) to the property of *argument externality*, then that property can be subsumed under the current proposal, without losing

empirical coverage or theory-internal merit. This is because one can simply replace any reference to externality with reference to *pair-merge* and VP-internal Case. One could even argue that this is advantageous in a theory-internal sense, because it would mean that *argument externality* is subsumed under better-motivated primitives (*set-merge*, *pair-merge*, and Case).

Moreover, wherever such a possibility exists, one could replace references to externality with reference to the *set-merge* vs. *pair-merge* distinction alone – deriving the fact that certain *pair-merged* arguments fail to pattern with the subjects of transitives, from the fact that they are rendered “inactive” at the VP level, by virtue of VP-internal Case checking (see 6.3.1, above). In these cases, the current proposal would represent a theoretical step forward, even in terms of explaining the mechanism behind external argument diagnostics.

6.3.3. A Note on Linearization

Finding a principled explanation for the property in (192c) – namely the fact that external arguments are necessarily linearized to the left of V^0 – seems to me to be a somewhat distant goal at this point, due to a lack of a comprehensive understanding of the set of principles involved in linearization.

However, it is important to note that an approach that simply correlates linearization to externality as a primitive (without further explanation), is by no means superior to one that correlates it with the elements of externality, under the current proposal – namely *pair-merge* and Case. In fact, for accusative Case in particular (which was demonstrated to be operative in choosing the external argument; see sections 2.3 and 3), there is independent evidence that it is operative at PF, affecting linearization processes (Neeleman & Reinhart 1997; Siloni 2001). In this sense, explaining *argument externality* in terms of Case and the type of merger involved could eventually simplify our understanding of these linearization constraints.

6.4. Interim Summary

Though the endeavor of eliminating *argument externality* as a theoretical primitive is not complete, the most important syntactic property of externality – being the first choice for checking the EPP – is derivable from the proposed system (see 6.3.1).

Moreover, in subsuming externality under independently motivated and studied primitives, the proposal opens the possibility of uncovering the missing correlates needed to give a comprehensive account of the remaining properties associated with *argument externality*.

Another issue that must be addressed is that of various grammatical processes that have been argued in the literature to be sensitive to *argument externality*. If *argument externality* has no grammatical reality as a primitive, then grammatical processes should not be able to refer to it.

As an example, consider the case of verbal passivization, which has been argued to target the external argument of a verb. One cannot eliminate *argument externality* as a primitive without suggesting an alternative account for the class of arguments targeted by this process. For verbal passivization, at least, a solution seems readily available: it is plausible that the class of targeted arguments is in fact not the class of external arguments, but rather better characterized as the class of arguments receiving [+] clusters as their thematic roles (as argued independently for adjectival passivization; Tal Siloni, p.c.). If this is true, eliminating *argument externality* as a primitive does not weaken our account of verbal passivization.

There remains, however, a formidable task: to show, for every process that has been claimed to target external arguments, that the class of arguments targeted can be defined in alternative terms – ideally, in terms of the thematic feature system proposed by Reinhart (2000) and used here (see section 3).

7. Conclusion

I began by showing that existing frameworks fail to predict which of a verb's arguments will be external, and under which circumstances. In addition, some internal arguments were shown to react to syntactic operations as if they were external.

Furthermore, given Bare Phrase Structure (Chomsky 1995b), and the problematic nature of the Little-*v* Hypothesis (Horvath & Siloni 2002), one is left with the question of how the syntactic mapping of external arguments differs from that of internal arguments.

I proposed a system in which both types of syntactic merger assumed in minimalist syntax (*set-merge* and *pair-merge*; Chomsky 2004) can be used to merge a verb's arguments. The type of merger used to merge a specific argument depends upon the thematic role assigned to that argument – the crucial factor being the feature-composition of the thematic role, in terms of the system developed by Reinhart (2000).

Under this proposal, the external vs. internal mapping of an argument is the result of the interaction of VP-internal Case with the type of merger used to merge the argument at its base position. I demonstrated that given Reinhart and Siloni's (2005) analysis regarding the

dual (structural vs. thematic/inherent) nature of Case in general, and accusative in particular, it is possible to determine which of the verb's arguments will check accusative Case. Coupled with the aforementioned system of merger, this allows consistent predictions for which of a verb's arguments (if any) will end up being mapped externally – predictions that were previously unavailable.

I showed that internal arguments behave syntactically as if they were external precisely in those cases where the system dictates that they will be merged via *pair-merge* (and check Case VP-internally). In such cases, the fact that they pattern with external arguments with respect to a given syntactic operation (e.g. extraction) can be explained by subsuming the relevant operation's sensitivity to external vs. internal mapping under sensitivity to the type of merger (i.e. *set-merge* vs. *pair-merge*) involved in merging the argument at its base position. The type of merger involved also provides an answer to the question presented above, regarding how the syntactic mapping of external and internal arguments differs. Puzzling behavior in a fixed sub-class of lexical causative verbs was also accounted for using this system.

Turning to arguments that have undergone movement, I argued for the empirical equivalent of the Freezing Principle (Wexler & Culicover 1977, 1980), which in minimalist terms, can be reformulated as a restriction of *Internal Merge* to *pair-merge*. This allows the Subject Condition (Chomsky 1986; Huang 1982; Kayne 1984) to be derived from the principles of the current proposal, while also accounting for the effects of Dative Shift on extraction. In fact, closer inspection of Subject Condition effects in languages that do not have obligatory movement of the subject to TP revealed that the effects are sensitive to the thematic role assigned to the subject. Given the current proposal, this sensitivity received the same explanation as the sensitivity to thematic roles exhibited by extraction from internal arguments – namely, a predictable difference in the type of merger involved in merging the argument at its base position.

Assuming the differing behavior of adjuncts with respect to Condition C is a result of adjuncts lending themselves to late-merger (Fox & Nissenbaum 1999; Fox 2002), and not of the fact that they are *pair-merged*, this proposal allows *pair-merge* to differ from *set-merge* in precisely one minimal and primitive way: the fact that it creates islands for extraction. Given the original motivation for the Freezing Principle, and its reformulation in minimalist terms, this may provide a previously unavailable “principled explanation” for the very existence of *pair-merge* in the Computational System.

Finally, I explored the possibility of eliminating *argument externality* as a theoretical primitive altogether. I showed that the property of external arguments being “first choice” for movement to subject position could be derived from the principles of the current proposal, while the explanation of other properties associated with *argument externality* can gain some clarity, at the very least, from formulating externality in the proposed terms.

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