

The Thematic Phase and the Architecture of Grammar

Julia Horvath and Tal Siloni

1. Introduction

This paper directly addresses the controversy around the division of labor between the lexicon and syntax. The last decade has seen a centralization of the operational load in the syntactic component. Prevalent trends in syntactic theory form predicates syntactically by the merger of various heads that compose the event and introduce arguments. The traditional lexicon is reduced to non-computational lists of minimal building blocks (Borer 2005, Marantz 1997, Ramchand 2008, Pyllkkänen 2008, among others). The Theta System (Reinhart 2002, this volume), in contrast, assumes that the lexicon is an active component of the grammar, containing information about events and their participants, and allowing the application of valence changing operations. Although Reinhart's work does not explicitly discuss the controversy around the division of labor between these components of grammar, it does provide support for the operational role of the lexicon. Additional evidence in favor of this direction is offered in works such as Horvath and Siloni (2008), Horvath and Siloni (2009), Horvath and Siloni (2011), Hron (2011), Marelj (2004), Meltzer (2011), Reinhart and Siloni (2005), Siloni (2002, 2008, 2012), among others. This paper examines the background and reasons for the rise of anti-lexicalist views of grammar, and undertakes a comparative assessment of these two distinct approaches to the architecture of grammar.

Section 2 starts with a historical survey of the developments that led linguists to transfer functions previously attributed to the lexical component to the syntax. Section 3 shows that two major empirical difficulties regarding argument realization that seemed to favor the transfer, can in fact be handled under an active lexicon approach. We then examine adverb interpretations, which have commonly been taken to provide evidence in favor of the “transfer to syntax” (section 4.1). We conclude that the transfer is unwarranted. Section 4.2 defines what we believe are the ultimate criteria for determining whether or not all valence changing operations can apply postlexically, and briefly surveys some evidence suggesting that some of them cannot. The Appendix examines the step in the evolution of the theory that preceded the transfer of all argument structure information into the syntax, namely, the exclusion of the external role from the lexical information of verbs and its insertion in the syntax. This step, too, we conclude, is unmotivated and problematic.

2. The emergence of syntactic decomposition

Debates over the division of labor between different components of the model have persisted through the past forty years of the evolution of generative grammar, and have led to significant empirical insights, as well as to the emergence of major diverging theoretical trends (e.g. Generative Semantics in the late ‘60s, Lexicalism, LFG, in the ‘70s). The bone of contention is whether computation is concentrated in one component (in the syntactic “engine”) or divided between two components, syntax and lexicon (independently of whether it is the lexicon proper or some module

interacting with the lexicon, as proposed in Di Sciullo and Williams 1987, Williams 2007).

Chomsky's (1965) *Aspects of the Theory of Syntax* integrated the lexicon into the model of grammar as a significant component feeding the syntactic derivation. Thus, from the early '60s, the information encoded in the lexicon, together with the phrase structure component, constituted the basis for the formation of D-structures; lexical entries included syntactic category specifications, as well as strict subcategorization and semantic selectional features determining lexical insertion into phrase markers. Viewing transformations a priori as the only device for capturing regularities, the Generative Semantics trend of the late '60s (Lakoff 1970, McCawley 1968) proposed to perform word formation and specify all systematic relations detected among lexical items by using an extremely unconstrained transformational component. It was in the early '70s, due to the impact of Chomsky's (1970) groundbreaking study "Remarks on Nominalization", which advanced the "Lexicalist Hypothesis", that the lexicon itself became the focus of intensive investigation. As a result of research during the '70s and '80s, the lexicon came to be conceived as an active component of the grammar: it was assumed to contain derivational operations, and/or "redundancy rules" for capturing various regularities of word formation and argument structure. These applied autonomously from the syntax, were formally distinct from syntactic operations, and were assumed to be able to generate new items to be added to the lexicon (Halle 1973, Bresnan 1982, Freidin 1975, Jackendoff 1975, Wasow 1977, Grimshaw 1990). Thus, the view of the lexicon that grew out of Chomsky's (1970) Lexicalist Hypothesis ("lexicalism") played an increasingly important role in the evolution of the theory, far beyond the immediate desirable consequences of lexicalism for limiting the expressive power of transformations.

Controversies regarding the lexicon during these decades involved only issues such as how much of linguistic phenomena should be captured by lexical operations, and exactly what kinds of lexical representations and lexical rules (e.g. word formation rules or redundancy rules) are appropriate to account for regularities regarding words and for the mapping of lexical items to syntactic structure (Jackendoff 1975, 1990, Wasow 1977, Williams 1981, Di Sciullo and Williams 1987, Grimshaw 1990, Levin and Rappaport-Hovav 1986, 1992, 1995). Until the late '80s, it was a standard, essentially unchallenged, assumption that beyond just being the storehouse for minimal atomic units (morphemes), i.e., a repository of idiosyncratic information, the lexicon is a component where word formation takes place, and where alternations in the projection of argument-taking heads (valence-changes) are accounted for. The items composed and listed in the lexicon – Lexical Items, "words" – were seen as the basic units of input for the syntax. A fundamental tenet of classical lexicalism was the Lexical Integrity Hypothesis (or Atomicity Thesis) stating that lexical items are unanalyzable units once inserted into syntactic structure, hence their subparts are inaccessible to syntactic operations. Thus, there was a sharp distinction drawn between the lexical item as a domain opaque to syntactic processes on the one hand and all syntactically composed domains on the other (see Lapointe 1980, Di Sciullo and Williams 1987, and Williams 2007).

This classic view of the division of labor between the syntax and lexicon has been gradually changing since the late '80s in a direction away from lexicalism. Recent years witnessed the elimination of the active (operational) role of the lexicon, and the

replacement of what used to be word formation, category and valence changing processes in the lexicon by syntactic operations (via the enrichment of functional syntactic structure). Thus a new “syntactocentric” approach was born advancing a “single generative engine” architecture. A further major development that followed this shift has been the extraction of thematic information from lexical entries, i.e., the elimination of theta-grids and argument mapping specifications, in favor of a syntactically decomposed representation of predicates that encodes event structure. These changes turn the traditional lexicon into a non-computational mere storage place, containing no derived forms, only bare roots separately listed functional morphemes, i.e., only minimal building blocks.

This radical change in the conception of the lexicon and the division of labor between it and syntax has been both enabled and actively driven by the convergence of several simultaneous developments that occurred from the mid '80s in the evolution of syntactic theory on the one hand, and semantics on the other.

Let us start with a survey of relevant developments on the syntactic side that rendered syntactic derivations able to take over the function of word formation, and that also made the decomposition of verb meanings in the syntax feasible. We then will turn to further developments and findings that brought to light particular empirical and conceptual shortcomings of the theory at the time, which favored the representation of event structure in the syntax.

Major developments within syntactic theory of the mid '80s that played a role in enabling the shift included (a) the introduction of functional heads and projections into X-bar theory (Chomsky 1986), (b) the appearance of independently motivated syntactic head movements, constrained by structure-preservation (Chomsky 1986, Koopman 1984, Pollock 1989, Travis 1984). These developments rendered the syntactic derivation capable of handling word formation and grammatical function changing, via head movement, “incorporation”, and A-movements of arguments (Baker 1988). They also opened the way for a further step: the syntactic decomposition of previously atomic lexical predicates.

The above aspects of syntactic theory of this period enabled the anti-lexicalist redistribution of labor but by no means motivated it. Thus the next question to consider is: What were the factors that drove the radical shift from an active lexical component towards a non-computational lexicon? The answer to this is split between a number of different, independently evolving trends that coincided roughly over the same period of time (from around the mid '80s to the '90s), and had the effect of jointly driving and reinforcing the shift.

One major strand of research consisted of a reexamination of the notion word and aspects of word formation. Initiated by Halle and Marantz (1993) and elaborated in Marantz (1997) and much related work, the model of Distributed Morphology (DM) advanced the claim that all word formation takes place post-lexically, and words are constructed by the same operations and in the same component as phrases. Marantz's (1997) main reason for rejecting lexicalism, and his call for the elimination of an operational lexicon, was a rather indirect one. It is based on challenging the traditional notion “word” as a unitary, well-defined linguistic entity, namely a domain where sound-meaning connections and idiosyncratic properties coincide. According to

Marantz, there is no reason to assume any special status for words as atomic building blocks (i.e., domains of special sound or meaning); only roots are such atomic units. Therefore, there is no more reason to derive and list words in the lexicon than there is to list phrases. This in turn is taken to justify the conclusion that only minimal, underived items (roots), should be listed in the “narrow” lexicon (labeled list 1). All derived entities, whether words or phrases, must be constructed in the syntax. Additional, post-syntactic, lists complete the information previously stored in the traditional lexicon: the phonological forms of terminal nodes are listed in the Vocabulary (list 2), feeding PF, and the idiosyncratic meaning of roots relative to their syntactic context is listed in the Encyclopedia (list 3), feeding the semantic interface. Marantz thus advocates depriving the lexicon of thematic, and also category, information (transferred to the syntax) as well as of morpho-phonological matrixes (inserted post-syntactically). Our discussion does not concern the latter facet. It may well be that late insertion of phonological material is the correct approach (see Anderson 1992, Marantz 1993, among others), but this does not entail stripping thematic information and operations from the lexicon. It is the latter, independent, issue that our paper addresses.

Apart from DM's calling into question an active lexicon based on the status of “word”, additional factors suggesting benefits from the transfer of derivational operations to the syntactic component involved developments within syntax itself. First, studies in the '80s uncovered a number of cases where a syntactic, rather than lexical, account for grammatical function changing and the corresponding word formation operation turned out to be empirically well-motivated. Most prominent among these was Baker's (1988) work, leading to his “mirror” principle, which argued in favor of the syntactic nature of a variety of derivational word formation processes. In view of the initial empirical success, Baker took the further step of introducing a principle constraining the mapping of thematic roles to syntactic structure, namely the Uniformity of Theta Assignment Hypothesis (UTAH), which required that identical thematic roles be mapped in identical structural (D-structure) configurations. This linking hypothesis and its variants had the far-reaching consequence of systematically forcing more argument structure changing operations out of the lexicon, reanalyzing them as syntactic operations. This in turn contributed to the addition of new abstract functional heads to clause structure.

Further impetus for the shift to enriching syntax and eliminating information from the lexicon emerged from two other independent directions. Both of them arose directly from certain inadequacies inherent to syntactic theory as it stood at the time.

One of these involved the realization that the internal structure of the verb phrase as assumed under X-bar theory is too impoverished to be able to handle some major robust empirical findings. The properties of ditransitives, regarding hierarchy and linear order, necessitated “more structure” within the VP (given the assumption of X-bar theory and the structure-preservation of movement), as was most prominently noted in relation to the dative construction.

The crucial pattern of data involved the structural hierarchy among the arguments of ditransitives and the linear position of the verb. As indicated by examples of weak crossover (1a,b), anaphor binding (2a,b), and negative polarity item licensing (3a,b), in the case of three-place predicates, the first one of the two internal arguments

asymmetrically c-commands the second (see Barss and Lasnik 1986, Larson 1988):

- (1) a. I gave every worker_i his_i paycheck.
- b. *I gave its_i owner every paycheck_i.
- (2) a. I showed Mary_i to herself_i.
- b. *I showed herself_i to Mary_i.
- (3) a. I sent no one anything.
- b. *I sent anyone nothing.

Thus, it was observed that the traditional VP had no sufficient structural positions to accommodate the hierarchical relations among its constituents. This shortage of appropriate positions was resolved by the influential VP-shell proposal of Larson (1988). The Larsonian shell provided the necessary positions for accommodating the observed structural hierarchy between the internal arguments as shown in (4b), while maintaining the VP internal subject hypothesis; the correct position of V, preceding both internal arguments, was derived by verb movement up to the empty V position of the outer layer of the VP-shell.

- (4) a. John gave the book to Mary.
- b. [_{VP} θ₁ give_i [_{VP} θ₂ t_i θ₃]]

But there was a disturbing assumption involved in this solution: the head of the outer VP-shell was a contentless V node, namely, a base-generated head void of any lexical material (whether overt or null). The postulation of this element was ad hoc and contrary to restrictive theories of phrase structure.

It is clear then why any proposal making available some new contentful head in addition to the lexical verb seemed correct. Such an extra head had the important added benefit of (a) introducing an additional specifier, thus making room for the external argument, and (b) providing a legitimate target (as required by structure-preservation) for V-raising. Indeed a series of different proposals adding a contentful head to the lexical verb, such as the “little-v” or a Voice head (e.g., Chomsky 1995; Kratzer 1996, respectively), and later heads reflecting event structure (von Stechow 1995, 1996, Pykkänen 2008, Ramchand 2008) achieved immediate popularity, also owing to this structural side-benefit.

Unrelated to the above developments, there was a further major factor driving the shift from lexicalism to syntactic decomposition of predicates. It was the realization that the treatment of thematic roles and their linking to syntactic positions (mapping) within syntactic theory of the '80s was empirically and conceptually inadequate. Specifically, beyond the well-formedness condition on θ-assignment stated by the Theta Criterion (Chomsky 1981), the semantic substance and cross-linguistic inventory of thematic roles had been left essentially unsettled. θ-roles were mentioned only as non-essential informal labels providing a convenient taxonomy. As observed most prominently by Dowty (1991), the assumed θ-role labels were unable to capture relevant empirical generalizations across θ-roles; they did not give rise to natural linguistic classes. Moreover, the rules specifying mapping (linking) of θ-roles to syntactic positions were in a similarly unsatisfactory state. There were thematic hierarchies proposed to determine the order of argument mapping, but the particular roles making up the hierarchy and their adequate ranking within it were quite

controversial. Furthermore, thematic hierarchies seemed ad hoc devices, still unable to capture mapping generalization across θ -roles. It became widely recognized that existing accounts for argument structure generalizations and the thematic information they made use of were inadequate (Jackendoff 1987, Rappaport and Levin 1988, Levin and Rappaport Hovav 2005, Dowty 1991).

Given this background on the state of syntactic theory of the '80s and early '90s, let us turn now to some simultaneously occurring developments on the semantic side. In contrast to the meager progress within syntactic theory proper regarding θ -roles, the topic of thematic structure and its relation to event structure were subject to intensive and very fruitful research within lexical semantics. In fact, over the past thirty years, starting with Davidson's (1967) seminal paper on the semantics of events, and with Vendler's (1967) work on aspectual types, a significant body of literature emerged addressing the structure of verb meanings in novel ways. These approaches advanced the hypothesis that the meaning of a verb is a structured representation of the event that it designates. Investigation of the internal structure of complex events in this research program has led to the idea that change of state (accomplishment and achievement) verbs consist of an inner and an outer event (i.e., two subevents): the outer one is associated with causation and agency, while the inner one with telicity and change of state. For instance, in *John sliced the bread*, the inner event is analyzed as the telic, change of state, event of the bread becoming sliced, and the outer event as the event of John acting agentively, namely doing “whatever is involved in the act of slicing” (e.g., Tenny and Pustejovsky 2000). The outer event is causing the inner one, thus the outer event is associated with causation.¹

The accumulation of such semantic insights and empirical generalizations regarding events resulted in the decomposition of verb meanings into structured subevents, captured by abstract predicates, such as CAUSE and BECOME (as in the semantics of Dowty 1979, and Parsons 1990). This development originally occurred within semantic representations, and in particular gave rise to rich lexical semantic representations such as Lexical Conceptual Structure (LCS) (e.g., Jackendoff 1983, 1987, Grimshaw 1990, Pustejovsky 1991, Levin and Rappaport Hovav 1995). Thus, at the beginning the decomposition of verb meanings into abstract predicates capturing event structure had no direct reflection in syntactic structure; they were semantic representations and were fully consistent with lexicalist models.²

However, as the emerging rich literature on event structure, and its apparent role in the mapping to syntax became more widely known to syntacticians, the idea arose of having event structure more directly reflected in syntax. The idea, in its strongest form, was that elements of event structure are explicitly represented in syntactic phrase structure. It is this approach that became known and widely popular within syntax, as syntactic decomposition, alias the syntactocentric approach. The approach, developed most consistently by researchers such as Borer (1994, 2005), Travis (1994, 2000), Ramchand (2008) eliminated thematic representations from the

¹ But see Neeleman and van de Koot (2012) for the claim that natural language predicates involve a causing event neither in their lexical-semantic representation nor in their syntax.

² The only exceptions to this were the early generative semanticists (such as Lakoff 1970, McCawley 1968), and possibly Hale and Keyser (1993). The latter proposed syntactic representations, which involved predicate decomposition, assumed however to be part of the lexicon (their l-syntactic structures).

lexicon, and accounted for the relation of arguments to the event via the position they occupied within the syntactic representation of event structure. The adoption of event structure information into syntax took hold and became a dominant trend in syntactic theory with unusual speed and without much critical scrutiny. This seems to be attributable to the specific time and state of syntactic theory at which the idea entered the scene. As outlined in detail in the discussion above, syntactic decomposition of predicates and the resulting phrase structure representation of subeventual structure seemed to immediately remedy (a) major structural problems such as the lack of sufficient room within the VP to properly accommodate the verb's arguments (see discussion of (4) above), and (b) the obvious insufficiency of the treatment of thematic roles and event structure within the '80s model of the syntax and the lexicon. This direction also clearly dovetailed with the independently developing anti-lexicalist trend associated with the DM framework and Baker's UTAH. In sum, importing event structure representation into the syntax was both feasible within syntactic theory of the time, and furthermore seemed highly beneficial.

In section 4 we will resume discussion of syntactic event decomposition and put forth criteria for determining the role of the syntax versus the lexicon in the theory of argument structure. Prior to that, however, it is crucial to clarify that we believe that roughly simultaneous recent developments in the theory of syntax and the lexicon in fact resolve the two major problems just mentioned, which favored the move towards such an approach. The next section is devoted to that.

3. Successive V-merger

We put aside syntactic decomposition for a while and return to evaluating it in section 4. Let us now examine an alternative path of exploration paved by the development of Bare Phrase Structure (Chomsky 1995) and the Theta System (Reinhart, this volume, 2002). As will become clear below, these two independent scientific developments crystallize into an elegant resolution for the problematic facets of the theory targeted by syntactic decomposition.

3.1 The Thematic Phase: Merger and Remerger

The stipulations of X-bar theory gone, minimalist bare phrase structure avails itself of (i) multiple specifiers (ii) a novel conception of head movement. We first discuss and discard the relevance of (i) for the issues at hand.

The option of multiple specifiers allows the correct hierarchical accommodation of the verb's arguments within the verbal projection ((1)-(3)). However, it fails to yield the proper position of the verb. Under the multiple specifier scenario, English-type languages are erroneously predicted to realize the verb between the two internal arguments (5), rather than to the left of both.

(5) [VP [SPEC θ_1] [SPEC θ_2] V [COMPL θ_3]]

Note that the position of the head V is indeed higher in the structure than its initial merger ("base") position, and is outside of the constituent formed by the two internal arguments (hence higher than the position of either of the latter), as shown, for

instance, by the coordination in (6).

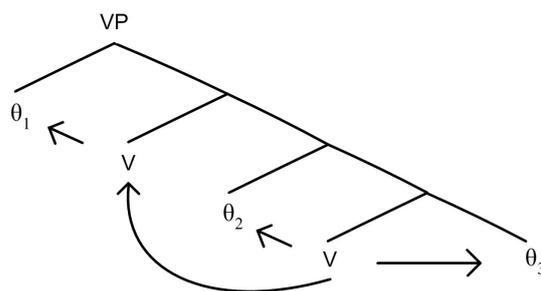
- (6) Bill will give [a book to John] and [a scarf to Mary].

The multiple specifier option, thus, is of no help here. However, under minimalist, bare phrase structure assumptions, another option suggests itself. Chomsky (2001) argues that given that the syntactic component, by nature, must involve External Merger, to the root of the tree, Internal Merger – that is, Remerger (movement) to the root – should a priori also be possible. Heads merge to the root and consequently should be able to remerge to it (that is, move) (see Donati 2006, Matushansky 2006). Remerger to the root is a “well-behaved” instance of head movement, one that does not involve head-to-head adjunction and therefore respects the extension condition (alias the *no tampering* condition) (Chomsky 1995, 2005), unlike the traditional head movement. (The latter has been known to run into severe problems under minimalist assumptions, as discussed in detail by Brody (2000), Harley (2004), Matushansky (2006), among others.) Further, remerger to the root does not require extra heads as targets of verb movement.

The adoption of this view of head movement can straightforwardly derive the internal organization of the verbal projection. Following the first merger of the verb, which introduces the internal argument(s), nothing prevents its copy from remerging to the root (extending the tree in accordance with the extension condition). In light of that, we suggest that the external argument, unlike the internal ones, is merged by V-remerger. This means that in addition to feature checking (valuation), also θ -assignment can trigger movement (remerger). Thus, while the verb assigns its internal roles via its first (external) merger, the external role triggers V-remerger. (The arguments themselves, of course, undergo external merger, as on earlier assumptions.)

Taking the case of a ditransitive verb, the internal arguments are projected via the verb's first merger (its external merger); subsequently, the external θ -role gets assigned by internal merger (remerger) of V to the root, as schematized in (7) below.

- (7)



θ -information, thus, is not divorced from the verbal head in the lexicon. The domain of θ -assignment is the VP, which is formed by V-merger and remerger. We believe this domain constitutes the lower phase, which we label the *thematic phase*.³ The

³ For concreteness, we assume (following Legate (2003), among others) that transitives as well as unaccusatives and passives give rise to a phase, the lower phase, the thematic phase, in our terms. Nothing we say, however, is contingent upon that.

thematic phase allows accommodating the verb's arguments in the correct hierarchy as well as locating the verb in the right position, as schematized in (7).⁴

Note that we argue that a V-remerger operation forms the thematic phase. Our proposal is noncommittal as to how other "head-movement" phenomena are analyzed (whether as remnant movements (see Kayne 1998 and Mahajan 2000 among others), as phonological "conflation" of adjacent heads (as proposed by Harley 2004), or as V-remerger accompanied by "m(orphological)-merger" (as proposed by Matushansky 2006 for the clausal functional domain). We now turn to mapping.

3.2 Mapping: The Theta System

Any mapping theory has to deal with the following questions: (a) What determines the order of mapping, including which role will be mapped externally? (b) What underlies the mapping generalizations observed across certain θ -roles and not others? For instance, what is common to Cause and Agent that makes them always external? And what is it about the Experiencer and Instrument that allows them in certain sentences to be external but not in others? If θ -roles are grammatical primitives (Agent, Cause etc.), it is not obvious what could capture generalizations across roles. As Dowty (1991) has argued, the θ -role labels as traditionally formulated do not give rise to natural linguistic classes in terms of their syntactic or semantic behavior.

In the Theta System (Reinhart 2002) θ -roles are not grammatical primitives, but conventionalized labels for feature clusters. The feature composition of roles is based on their semantics. Importantly, however, it turns out to allow capturing generalizations across θ -roles regarding mapping among other things.⁵ As will become clear below, under the Theta System, θ -roles patterning alike form natural classes. Two atomic features underlie the set of θ -roles; the features refer to causality and sentience, two pivotal factors in studies of argument structure, and most probably in human cognition (see Haiden 2012, for instance). The features are: (i) *c*, which determines whether or not the argument in question is necessarily responsible for causing the denoted event/change⁶. (ii) *m*, which determines whether or not the mental

⁴ Assuming PF-linearization of sister nodes and Spell-out of either the head or the tail of chains (at least), various surface VP realizations emerge. Examining the various options and possible constraints is beyond the scope of this paper. Let us nonetheless illustrate what we have in mind, taking an OV language (German) as an example. The German VP shows constituency effects different from English; as the coordination in (i) shows, the verb can form a constituent with its internal argument (compare with (6)):

(i) Ich habe gehört, dass Bill seiner Frau [ein wertvolles Buch gezeigt] und [eine
I have heard that Bill his-DAT wife a valuable book shown and a
schöne Schallplatte geschenkt] hat.
nice record given (as gift) has

This is straightforward under the thematic phase, if in German, the tail of the V-chain is spelled-out at the right edge of the VP.

⁵ The idea that thematic roles are not unanalyzable atoms but can be defined in terms of some limited set of semantic features had been proposed in earlier literature, such as Anderson (1977), Ostler (1979), Rozwadowska (1989); for a critical discussion of these approaches, see Levin and Rappaport Hovav (2005, ch. 2.3.1).

⁶ "Causing the denoted event/change" is interpretable either as causing the eventuality whether it is eventive or stative, or alternatively, as causing a change, that is, the event or activity, excluding states. If the latter view is on the right track, then states cannot involve roles positively specified for *c* as they

state (including volition and intention) of the argument in question is relevant to the denoted event. Each of these features can be valued for [+] or [-], or be unvalued. The Feature clusters (the roles) determine the relation that the corresponding participant (argument) bears with regard to the event. The correspondence of the clusters to the known θ -roles is not always one to one. Many of the clusters have varying contextual interpretations. It is nevertheless convenient to label them by the role that they are most typically related to. Let us start with the fully specified (valued) clusters.

(8) Fully specified clusters

	Cluster	Label	Causes the denoted event (change)	Its mental state (volition, intention) is relevant
a.	[+c+m]	Agent	Yes	Yes
b.	[-c-m]	Theme	No	No
c.	[-c+m]	Experiencer	No	Yes
d.	[+c-m]	Instrument	Yes	No

In addition to the fully specified clusters, there are four "unary" clusters, that is, clusters unspecified with respect to one of their features. These clusters have a greater range of interpretations, as one of their features is unvalued and can be interpreted as either positively or negatively valued in specific utterances.^{7,8} The unary clusters are given in (9), and commented on directly.

(9) Unary clusters

	Cluster	Label	Causes the denoted event (change)	Its mental state (volition, intention) is relevant
a.	[+c]	Cause	Yes	Unvalued
b.	[+m]	Sentient	unvalued	Yes
c.	[-c]	Goal, Benefactor	No	Unvalued
d.	[-m]	Subject Matter, Target of Emotion	Unvalued	No

[+c] (Cause), just like [+c+m] (Agent), brings about the denoted event and is therefore positively valued regarding the feature *c*. The difference between the Agent and Cause is that the former involves properties of volition and intention, which are captured by a positive value for the feature *m* (8a). Cause, [+c], in contrast, is unspecified for mental state (9a). It can therefore be interpreted as an inanimate Cause argument (a natural force, ambient condition etc.), an Instrument or an Agent, depending on the specific sentence it appears in. The difference between an inanimate Cause argument and an Instrument is that the latter never causes the event by itself, but requires an explicit or implicit Agent (Reinhart 2002, Siloni 2002).

involve no change. See Meltzer (2012) for the latter view, and Neeleman and van de Koot (2012), and Rákosi (2006), for the opposite view.

⁷ The system also avails itself of an empty cluster [Ø], unspecified with respect to both features. It has been argued that this cluster is relevant with regard to lexical middle-formation (Marelj 2004), light verbs (Ackema and Marelj 2012), and lexical reciprocal verbs (Siloni 2012).

⁸ Marelj (2004) proposes a principle of full interpretation that requires that underspecified clusters be interpreted as fully specified at the level of interpretation. This requirement is, of course, subject to the constraint banning the co-realization of two identical roles/clusters per predicate (Bresnan 1982, Carlson 1998; Parsons 1990, Pesetsky 1995; Williams 1981, among others).

[+m] has not been singled out as an independent role by other approaches. In the Theta System it is labeled Sentient. This cluster is associated with the subject of verbs such as *see, hear, love, know, believe*, which is usually viewed as an instance of the Experiencer role. In their interpretation, Sentients [+m] and Experiencers [-c+m] are hard to tease apart, as the sole difference between them is that the former should be able in certain sentences to be interpreted as causing the relevant eventuality. As will become clear below, in the Theta System Experiencers [-c+m] and Sentients [+m] have very different syntactic realizations (mapping), which is indeed correct: The sentient always merges externally, unlike the Experiencer, which has varying realizations. Horvath and Siloni (2011), in their study of causativization, provide further support for the split, as briefly mentioned at the end of the section and in section 4.2.

[-m] corresponds to the Subject Matter/Target of Emotion role, put forth by Pesetsky (1995): *his health* in *John worries about his health*.⁹ Like the [-c-m] cluster (Theme), [-m] is indifferent regarding the mental state of the argument; hence it is negatively valued for *m*. Unlike the [-c-m] (Theme), [-m] can, in certain contexts, be interpreted as causing the event. Thus, for instance, in *John worries about his health*, it may be *his health* that is the Cause of the worry, but it may also be, say, some doctor that caused John to worry regarding his health. Whether or not [-m] is interpreted as Cause depends on the specific context.

Finally, consider the Goal argument (e.g. *John sent a book to Goal*). This argument cannot be interpreted as standing in the Cause relation to the event; therefore its *c* value must be negative. The mental state of the Goal can be relevant or irrelevant to the event; hence, it is unspecified for the feature *m*, and corresponds to [-c].

Importantly, the feature composition of θ -roles gives rise to natural classes of roles with regard to mapping. The Cause, Agent, and Sentient, which are mapped externally, belong to the class of roles with positively valued features only (they are [+] roles); this correlation underlies the mapping instruction (10a). Theme, Goal and Subject Matter, which are internal roles, are negatively valued ([-] roles), which is captured by (10b).

- (10) a. The class of [+] clusters is mapped externally.
 b. The class of [-] clusters is mapped internally.

Experiencer and Instrument have in common their non-uniform feature composition: they both involve [-] and [+] values. In this respect, they are “mixed” clusters. As already mentioned above, they are external in certain sentences but not in others. More precisely, they are externally mapped in the absence of an external role by definition (10a). The alternating realization of mixed roles is illustrated with the Instrument in (11a) vs. (11b).

- (11) a. Sara_[+c+m] can peel the apple_[-c-m] with a knife_[+c-m].
 b. The knife_[+c-m] can peel the apple_[-c-m].

⁹ Pesetsky (1995) distinguishes between two roles: Subject Matter, which is the role he attributes to verbs such as *worry* (the Subject Matter of the worry), and Target of Emotion (the argument that is evaluated by the Experiencer as part of “the emotional episode”), which is attributed to verbs such as *anger*. These two types of roles are usually lumped together by philosophers under the cover term “object of emotion”. In the feature system, they both correspond to the [-m] cluster.

Technically, the mapping instructions are captured in the Theta System by marking rules that assign to [+] roles the merging index 1, which determines mapping as external argument, and to [-] roles the merging index 2, which indicates internal mapping. Mixed clusters are not assigned any index; they are external in the absence of an external role (a role indexed 1). This is so because external mapping is preferred on grounds of economy, owing to the EPP.¹⁰

Finally, it is important to mention that the feature composition of θ -roles allows capturing additional generalizations, beyond those regarding mapping. Thus, for instance, it is shown in Horvath and Sioni (2011) that the set of verbs that can serve as input to causativization (resulting in an Agentive verb) in Hungarian constitutes a natural class under the Theta System, namely, the class equipped with a [+] role (Agent [+c+m], Cause [+c], and Sentient [+m] (but crucially not Experiencer [-c+m] and other non [+] roles). Importantly, external mapping is insufficient to define the input for causativization because mixed roles (e.g., [-c+m]) even of entries that would map them externally do not license causativization. It is the presence of a positively valued role that makes a verb an eligible input for the operation.¹¹

3.3 Back to the thematic phase

As is clear from the previous section, there are in effect three types of arguments as far as mapping is concerned: (i) those that are mapped externally in any context ([+] roles: Agent, Cause, Sentient) (ii) those that are external if possible (mixed roles: Instrument, Experiencer) (iii) those that are internal in any context ([-] roles: Theme, Goal, Subject Matter). Two additional observations are in order. First, no role is a priori obligatory (independently of the verb). Second, while the external role is

¹⁰ Reinhart's system is slightly more articulated as her marking procedure applies to two-place entries only (this ultimately derives the different mapping of unaccusatives and emission verbs). Potashnik (2012) argues that this constraint on the marking procedure is unnecessary. We abstract away from this issue here, as it is not directly relevant for our purposes.

¹¹ On syntacticocentric approaches, syntactic structure directly determines the role that the argument plays in the event, as syntactic structure is determined by event decomposition. Approaches of this sort fare nicely with certain salient generalizations regarding argument realization. Thus, for instance, the causer is external as it is merged in the cause subevent, which is higher than other subevents. The Theme is internal as it is part of a lower subevent. Moreover, if the syntactic hierarchy of subevents locates the subevent inserting the Experiencer argument (or the Instrument) lower than the causing subevent, but higher than other subevents, then it is expected to be the hierarchically highest argument in the absence of the causing subevent. Where approaches depriving the lexicon of its active role seem to fail and must resort to postulating additional mechanisms, is in explaining pairs such as (i)-(ii), where the same set of roles, Subject Matter and Experiencer, have distinct syntactic realizations, as observed by Pesetsky (1995). See Reinhart (2002) for a lexical account of these data, which ascribes a distinct lexical derivation to each instantiation (motivated among other things by the systematically different morphological form each verbal instantiation exhibits in languages with rich morphology, such as Hebrew (iii)-(iv): Only the subject-Experiencer instance bears morphology typical of valence-changing operations (iv)).

(i) His remark puzzles Sara.
(ii) Sara puzzles (over his remark).
(iii) ha-he'ara šel-o mafli'a et Sara.
the-remark of-him puzzles/amazes ACC Sara
(iv) Sara mitpalet (al ha-he'ara šel-o).
Sara puzzles/is amazed (about the-remark of-him)

exclusive (natural language allows only one external role per predicate), the others are not.

The thematic phase straightforwardly allows a structural definition for each set of arguments (roles). Recall first that we suggested in section 3.1 that internal roles (indexed 2) are mapped via the first merger (external merger) of V, while the external role (indexed 1) is mapped via remerger (internal merger) of V to the root. More precisely, since the external role is exclusive, it must be defined as the last role assigned by remerger of V; hence, its exclusiveness. What about mixed clusters (unmarked roles)? We know that unlike internal roles (roles indexed 2), a mixed role is external if the verb does not include a role indexed 1 (a [+] role). It follows that mixed roles must be assigned differently than internal roles. Assume a mixed role is uniformly assigned via remerger of V, following the first merger of V (which introduces the internal arguments). If so, then in the absence of a role indexed 1, the mixed role is automatically the last argument merged by V-remerger, and therefore qualifies as external. In case a role indexed 1 is present, the mixed role is not the last argument merged by the remerger of V and therefore does not count as external.

(12) summarizes the structural definitions of the external versus internal arguments. Any other argument is neither internal nor external: It is mapped by remerger of V and qualifies as external in the absence of a [+] role, as just explained.

(12) Structural definition of external versus internal arguments

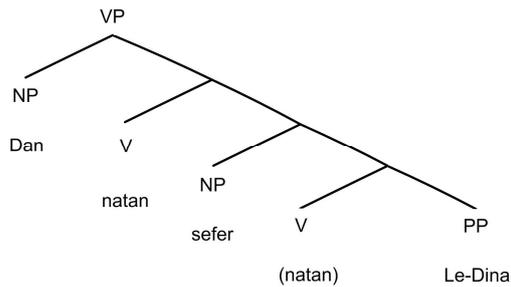
- a. The last specifier merged by V-remerger is the external argument.
- b. Any argument merged by the first merger of V is an internal argument.

As any argument merged by the first merger of the verb is an internal argument, it follows that [-] roles (indexed 2) can cooccur. In case, two arguments are marked for internality (receive index 2), we expect optionality in the merging order. A priori, either can be merged first (in the complement position), unless independent considerations block one order, e.g., case (Preminger 2006).¹² (13) illustrates this optionality in Hebrew; (14) schematizes the corresponding trees. Unlike the internal arguments, the external one is merged by remerger of V.

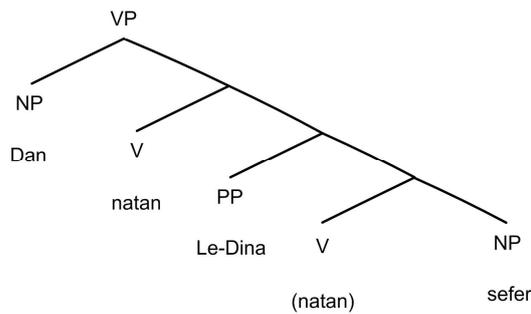
- (13) a. Dan natan sefer le-Dina.
Dan gave book to-Dina
b. Dan natan le-Dina sefer.
Dan gave to-Dina book

¹² As mixed roles do not bear index 1, they are not by definition exclusive (as noted above). This may suggest that they can in principle cooccur. Whether verbs with multiple mixed roles indeed exist is an empirical question. If they do, the order in which their mixed roles are merged would be expected to be similarly free, or being fixed by additional factors.

(14) a.



b.



Further, the structural distinction between intransitive unaccusatives and unergatives follows from our definition of externality versus internality (12). Specifically, as unergatives map externally, they must merge their argument upon remerger of V because an external argument, by definition, cannot be merged by the first merger of V. Thus, on the thematic phase approach, being unergative means undergoing external (first) merger vacuously, given that this merger cannot involve an argument. The ensuing structural definition of unergative verbs is given in (15).

(15) Structural definition of unergatives

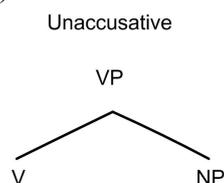
Unergative verbs are intransitives whose external merger is vacuous (fails to include an argument).¹³

The structural distinction between the two types of intransitive verbs, unaccusatives and unergatives, is schematized in (16a-b) below.¹⁴

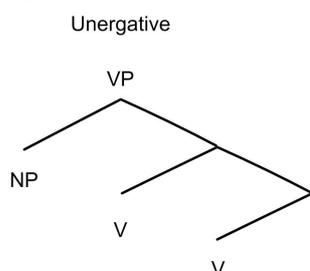
¹³ It is well-known that only unergative verbs allow the so-called argumental cognate object. More precisely, languages either (i) allow cognate objects only with unergatives (English, French) or (ii) exhibit two types of cognate objects: argumental – only with unergatives – and adverbial (possible with transitives, passives and unaccusatives, e.g., in Hebrew, see Pereltsvaig 2002 for the distinctions between the two). This peculiarity of unergatives may be an additional reflection of their inert external merger: it is either vacuous or involves a cognate object, which is to some extent "internal" to the verb.

¹⁴ Our definitions also capture the distinction between two-place unaccusatives, which map both arguments by the first merger of V, versus other two-place verbs, which merge one argument upon the first merger and the other upon remerger of V. For reasons of space we do not elaborate on that any further here, nor do we examine other interesting consequences of our approach with regard to various verbs classes and their mapping.

(16) a.



b.



Structurally, only the first argument merged via external V-merger – that is, the argument merged in the complement position – is c-commanded by all copies of the verb. The external argument is c-commanded by no copy of the verb. Intermediately merged arguments (whether by V-merger or V-remerger) occupy the midfield and are c-commanded by some but not all copies of the verb.

These structural distinctions offer an insight into the varied extraction data that these three types of arguments show. It is well-known that extraction from the verb's complement is unproblematic (17a), while extraction from its external argument is disallowed (17b).¹⁵ Under the thematic phase, extraction from a position c-commanded by all copies of the verb is possible, while extraction from a position not c-commanded by the verb is disallowed.

- (17) a. Who did you tease friends of?
b. *Who did friends of tease you?

However, one finds more variable judgments, and intermediate degrees of acceptability, when testing whether extraction is possible from diverse arguments occupying the *intermediate specifier* positions within the thematic phase (as in (14)). Thus, for instance, speakers we consulted tend to detect a mild contrast between (18a,c) and (18b,d), favoring the former over the latter versions:

- (18) a. Who did John send a friend of Mary's pictures of?
b. ?Who did John send pictures of to a friend of Mary's?
c. Which book did you show Bill reviews of?
d. ?Which book did you show reviews of to Bill?

This difference in acceptability level could follow directly from the structural distinction between the two pairs, if extraction from positions c-commanded by some, but not all, copies of the verb is more difficult than extraction from the complement

¹⁵ For evidence that what is violated in cases like (17b) is indeed a prohibition on extraction from an external argument, rather than from a subject in Spec, TP position, see Chomsky (2008).

position, which is c-commanded by all copies. Thus, in (18b,d) extraction takes place from an intermediate specifier position and hence is worse than extraction in (18a, c), which is from the complement (first merged argument) position.¹⁶

Thus, data from the realm of argument realization do not favor syntactic decomposition. The Theta System can handle mapping in an elegant fashion. It is however widely held that certain ambiguities regarding adverb interpretation provide strong support in favor of the adoption of event decomposition into syntactic structure. The next section examines this evidence.

4. Back to syntactic decomposition: Taking stock

4.1 Any support from adverb interpretations?

The interpretation of certain adverbs is commonly argued to provide strong support in favor of syntactic decomposition (a claim originating in the generative semantics literature of the '60s). Specifically, the different interpretations available for adverbs such as *again* and *almost* with certain lexical predicates have been frequently cited as direct evidence for the structural decomposition of individual predicates into multiple events, each represented by a distinct syntactic head (most prominently, in von Stechow's (1995, 1996) analysis of German *wieder* 'again'). Given the central role attributed to the adverb interpretation evidence in establishing the syntactic nature of decomposed event structure, it is important to subject these phenomena to some closer scrutiny in order to assess their validity and potential relevance.

The interpretations of *again* (see Dowty (1979)) and its counterparts in other languages are commonly used in current literature as important empirical support for syntactic decomposition. The argument is based on the so-called *repetitive* versus *restitutive* interpretations of the adverb *again*, and their syntactic analyses (e.g. von Stechow (1995, 1996); Beck (2005); Pyllkkänen (2008)).

It is noted that a simple transitive verb such as the achievement verb *open* in (19) manifests the following two interpretations for *again*:

(19) Bill opened the door again.

¹⁶ A possible alternative account that might come to mind at this point is that the (18a,c) versions are judged superior due to a preference for extraction from clause final phrases, possibly due to phonological factors (such as the phrase bearing nuclear stress). Further data however indicates that the latter idea is not on the right track, and provides additional support for our structure-based hypothesis stated in terms of the thematic phase. Consider the following contrasts, noted in Johnson (1992: 269 (24c)).

- (i) ??Who did this book worry a friend of?
- (ii) Who did you visit a friend of?

Extraction in (i) is from a clause final phrase, just like in (18a-c) above, yet its acceptability is degraded compared to (ii). On our assumptions about argument mapping couched in the Theta System, the contrast follows. The Experiencer argument of *worry* is a mixed (non-homogeneous) cluster, which is always introduced by re-merger of V, thus occupying a specifier position. Extraction from the Experiencer argument (*a friend of who*) in (i) is then correctly predicted to be degraded relative to extraction from a complement (ii) (for more on the derivation of (i), see Reinhart 2002).

- i. Bill did it again – Presupposes: he had done it before. (repetitive)
- ii. The door is in an open state again – Presupposes: it had been open before. (restitutive)

The claim utilized in syntactiocentric approaches is that these different readings are due to a *structural ambiguity* that results from the different structural positions that *again* (possessing a single constant meaning) occupies in the decomposed syntactic structure. In (19), syntactic decomposition would mean that we have a constituent denoting an outer, causing event of “Bill causing a process of the door opening”, and an embedded one denoting the result state of “the door being open”. The attachment of the adverb *again* to the constituent denoting the causing (outer) event would result in the repetitive reading; its attachment to the embedded (inner) constituent denoting the result state would derive the restitutive reading.

Based on the same rationale, the interpretations of the adverb *almost* are also mentioned sometimes as evidence for decomposition, as first suggested by generative semanticists (McCawley 1972, and more recently, Rapp and von Stechow 1999). Like *again*, *almost* seems to be able to modify the Cause meaning component of *open* as in (20i) or the Result component as in (20ii).

- (20) John almost opened the door.
- i. John almost did something that would have had the effect of the door opening.
 - ii. John did something that had the effect of the door almost being open.

In fact McCawley (1972) has already noted that *almost* gives rise to an additional interpretation; in (20) it can also mean that John did something that almost had the effect of the door opening. Moreover, Sevi (1998) and Tenny (2000) reject the claim that *almost* involves structural ambiguity, showing that it allows plenty of additional “intermediate” readings, which do not clearly fall into one of the above interpretations.

Sevi (1998) concludes that the interpretations of *almost* represent a case of vagueness. He develops a semantic analysis (also capturing the semantics of *barely*) that derives the different available meanings from the adverb's “contextual dependence”, namely its ability to choose various appropriate comparison domains (i.e., different aspects of evaluation circumstances, such as world/standard/time of evaluation).

Let us turn now to the repetitive versus restitutive interpretations of *again*, which constitutes a potentially better case of structural ambiguity. We will first apply an ellipsis test that is a known diagnostic for structural ambiguity. This diagnostic was in fact used by Kempson (1977) for the case of *almost*, and led her to question the claim that it represents a case of ambiguity.

Let us first reproduce the line of reasoning underlying the ellipsis diagnostic. Recall that an elided sentence must be structurally parallel to its antecedent sentence (Sag 1976, Williams 1977, Fox 1995, 2000). For example, the sentence in (21a) is structurally ambiguous: either the PP *with a stick* is dominated by the embedded predicate *walk* (as it modifies it), or it is outside the embedded constituent, attached to the matrix predicate (as it modifies the causing eventuality *make*). In the ellipsis

construction (21b), this structural ambiguity is preserved, but both the antecedent and elided sentences must involve the same interpretation (both matrix or both embedded construal for the PP).

- (21) a. Max made the patient walk with a stick.
b. Max made the patient walk with a stick and so did Felix.

The same ellipsis test can be applied to assess the two interpretations associated with *again*, namely to test examples such as (19) for the presence/absence of structural ambiguity. Consider the scenario in (22) described by Paul, a nosy neighbor of John and Bill, who had to report their movements this morning to the police. Paul's last sentence (italicized) is an ellipsis construction, in which *again* can only have the restitutive reading in the antecedent sentence, although it most naturally has the repetitive reading in the elided sentence. This would be unexpected if the two readings resulted from structural ambiguity, given the parallelism requirement exhibited by ellipsis constructions (see (21) above). The (b) version of (22) shows that the last sentence of (22) is also licit when *again* has the repetitive interpretation in the antecedent and the restitutive one in the elided clause (i.e., the reverse of what we have in (22a)); thus the choice of restitutive or repetitive in the antecedent of the ellipsis seems to make no difference for the acceptability of the construction.

- (22) a. Paul: "This morning I saw John closing his door, which was installed wide open yesterday and left open since. When closing it, he must've heard that Bill, his neighbor next door, opened his door briefly to pick up the newspaper. *Afterwards John opened the door again and so did Bill.*"
b. "...*Afterwards Bill opened the door again and so did John.*"

The behavior of the (italicized) elliptical sentences in (22a,b) is clearly very different from the case of structural ambiguity (e.g., (21)); only the latter categorically disallows a distinct interpretation in the antecedent and in the elided clause.

However, it must be noted that the ellipsis test in cases such as (20) involves subtle acceptability judgments, which also manifest some cross-speaker variation. A factor that may raise doubts about any strong conclusion drawn just based on this is the fact that the restitutive meaning of *again* in *open the door again* is entailed by its repetitive interpretation. Consequently, in spite of the context establishing that Bill had in fact opened the door once before and then repeated his action, this still might leave room for the speaker to ignore the repetitive nature of Bill's action, while judging the italicized elliptical sentence (22a,b), thus considering Bill only as having caused a second occurrence of the door being in an open state – an interpretation indeed factually true in the context. To get a reliable judgment for (22), the speaker must be sure to keep apart the two potential meanings. This makes the judgments more difficult, and the evaluation of their actual validity less unequivocal. But beyond the results of the above ellipsis test, there are a range of other facts that raise serious doubts about the claim that the two interpretations of *again* result from structural ambiguity.

First it must be noted that the accessibility of the repetitive versus restitutive readings observed for *again* differs sharply and systematically: across the board, the restitutive reading of *again* is much more difficult for speakers to access, and often can be

induced only by providing an explicit explanation of the relevant state of affairs. On a strict structural ambiguity account for the two readings such an asymmetry would be quite unexpected.¹⁷

Another kind of problem for the syntactic decomposition approach is observed by Chierchia and McConnell-Ginet (1990:359). They note that the expected repetitive versus restitutive ambiguity is in fact not exhibited uniformly by the set of verbs that would be expected to show it, if it were structural. This can be seen when we compare the behavior of the verb *clean* (23) with (19) above. The interpretation of *again* in (23) is unambiguous: only the repetitive reading is available.

- (23) John cleaned the jacket again.
i. John did it again. (repetitive)

The restitutive reading “the jacket is clean again” is unavailable with *clean* (23), in contrast to the ambiguity observed with *open* (19). This is brought out most clearly given the following scenario for (24):

- (24) John bought a new jacket in a clean state which had never been cleaned before; when it got dirty with use, he cleaned it.

Under these circumstances, it is impossible to use (23). Further, it is observed that the periphrastic (25), unlike (23), indeed exhibits the repetitive versus restitutive ambiguity, as expected; this is so because *again* can be structurally associated with either the matrix or the embedded predicate.

- (25) John caused the jacket to be clean again.

So the question for proponents of syntactically decomposed event structure is why a verb such as *clean* would fail to exhibit the same structural ambiguity. Importantly, *clean* is an accomplishment verb that can denote a telic eventuality, which involves a CAUSE and a RESULT STATE. This is indicated by well-established aspectual

¹⁷ Beck, Berezovskaya and Pflugfelder (2009) provide quantitative evidence that in current English the restitutive use of *again* is in fact significantly reduced compared to 19th century English, and thus conclude that it is in the process of disappearing. If true, this would be a highly implausible scenario for language change and cross-linguistic variation under the syntactic decomposition view. Under decomposition, such a process would have to mean that English is currently undergoing either (a) a change in its syntactic representation of the RESULT meaning component of predicates, or as suggested by Beck et al. based on Rapp and von Stechow (1999) (b) a change in the set of legitimate adjunction sites of adverbs, and specifically *again*. To implement this, a “Visibility Parameter” is postulated, specifying whether or not a particular adverb can modify phrases headed by the trace of a raised predicate, rather than an overtly realized lexical predicate. Option (a) is directly discarded by Beck et al, for good reasons; however option (b), which they adopt, also appears to be an implausible candidate for a parameter capturing cross-linguistic variation. Why would certain adverbs be sensitive to whether they modify an overtly headed or a trace (copy)-headed constituent? There is no known precedent for such a condition. If so, the decomposition-based view of the repetitive vs. restitutive interpretations of *again* is in fact weakened by the empirical findings of Beck and al. In contrast, the observed diachronic change, as well as cross-linguistic variation in general, regarding the availability of the restitutive reading falls in place naturally under accounts that do not rely on the syntactic decomposition of predicates, such as lexical ambiguity proposals for *again* and its German counterpart *wieder* (e.g. Fabricius-Hansen 2001), or semantic underspecification-based accounts (e.g. Maienborn 2003).

diagnostics of the lexical semantics literature, such as the felicitous occurrence of the verb with adverbials denoting finite temporal duration of an event (expressions meaning ‘in X amount of time’), as shown for both *open* and *clean* in (26a)-(27a); as expected, the verb *clean* gives rise to an entailment regarding the result state (26b), on a par with *open* (27b).

- (26) a. John cleaned the jacket in an hour.
 b. After that the jacket was clean.
- (27) a. John opened the door in five minutes.
 b. After that the door was open.

Under syntactic decomposition, the complex event structure of these verbs would be represented by (at least) two distinct syntactic heads, as in (28).

- (28) [John CAUSE [$\sqrt{\text{open/clean}}$ [the door/the jacket]]
 ↑ _____ |

But if this were the structure, we would expect that the (alleged) structural ambiguity of *again* would arise equally with both *open* and *clean*, contrary to fact.

It should be noted here that *clean* has an activity meaning ingredient. Thus the question might arise whether the availability of the restitutive reading of *again* with the verb *open* but not with the verb *clean* could possibly be due to this aspectual difference (achievement vs. accomplishment) between the two. That this is not the case is demonstrated by verbs such as *dig*. In (29a), together with the delimited object *the cave*, *dig* describes an accomplishment comprising the result state of being dug. This is shown by the felicitous addition of the *in*-phrase (29a), and the entailment in (29b). As shown by the scenario in (31), *dig* exhibits the restitutive reading of *again* (30ii) (in addition to the repetitive one (30i)).¹⁸

- (29) a. They dug the cave in an hour.
 b. After that the cave was dug.
- (30) They dug the cave again.
 i. They did it again. (repetitive)
 ii. There was a cave again (restitutive)
- (31) Story tellers used to meet every year in a huge natural cave in mount Ida for a story telling festival. Ten years ago the cave collapsed. The locals dug the cave again and intend to renew the tradition.

Moreover, the adverb in (31) does not even involve the result state subcomponent of *dig*, namely the sentence *The locals dug it again* does not mean that the cave was in a

¹⁸ Another difference between *open* and *clean*, as noted by an anonymous reviewer, is that the latter fails to have an unaccusative (inchoative) alternate. However this difference too cannot be the source of the absence of the restitutive interpretation in the case of *clean*, as is shown by the examination of the verb *dig* below. The latter verb is parallel to *clean* also in not having an unaccusative alternate, yet, as shown in (31), it does exhibit a restitutive interpretation with *again*.

‘dug’ state again (since, having been a natural cave, it never had been dug before). Rather, the restitutive reading entails only that once again there exists a cave; this cannot be the result of modification of the result state constituent.¹⁹

The above discussion of the verb *clean* versus *dig* seems to pose a challenge for the claim that the interpretations of *again* in cases like (19) are instances of structural ambiguity, and thus these interpretations cannot be taken to provide evidence for the *syntactic* representation of subeventual structure.

A further set of cases that are observed to manifest both a repetitive and a restitutive interpretation for *again* and that have often been claimed to involve syntactic decomposition are verbs whose meaning manifests a CAUSE component and a Possession (HAVE) relation (see Beck and Johnson (2004)). This is exemplified by the verbs in the double-object construction, such as *give*, where the possession relation is claimed to hold between the Goal (Possessor) and the Theme:

(32) a. ..._{[vP-Cause} Mary give _{[HaveP} John the book_{]]}

Potashnik (forthcoming) shows that a restitutive reading for *again* is found also with verbs where although the above detected Possession relation (the RESULT) holds, yet no syntactic constituency can exist that would capture it (the possessor being the external argument and the possessee – the Theme, both marked in bold).²⁰

(33) a. **Sandy** grabbed / captured / caught **the ball** again.
b. I think I found God, but now **I**’ve lost **him** again.

(Potashnik, forthcoming)

In sum, the above observations cast doubt on the claim that the repetitive and restitutive interpretations of *again*, and its counterparts in other languages, are cases of structural ambiguity. If they are not, then they provide no evidence for the syntactic decomposition of lexical verbs.²¹

¹⁹ This observation regarding the restitutive interpretation of *again* with the verb ‘dig’ is not an isolated one. Additional verbs manifesting a restitutive interpretation with *again* that does not involve modification of a syntactic RESULT subcomponent of the verb, but rather of something inferred from an entailment of the activity denoted by the verb are pointed out by Potashnik (forthcoming). Some naturally occurring examples he presents to demonstrate this involve the verbs *slam* and *abandon*, for example:

(i) But as suddenly as they appeared, *the visitors abandoned the zoo again*. By midweek there was no soul in sight.

²⁰ Potashnik discusses in detail different potential syntactic representations of the possession relation aimed at capturing the restitutive reading in cases such as (33), and shows that none of them is tenable.

²¹ For conceptual and empirical arguments against versions of the decomposition approach, see Fodor, Fodor and Garrett (1975) and Fodor and Lepore (1999) (who present psycholinguistic evidence). For a comprehensive summary and discussion, see Chierchia and McConnell-Ginet (1990).

Another phenomenon often cited as evidence in support of the syntactic decomposition of change of state verbs is the possibility of adding a temporal modifier (a *for*-phrase in English) that appears to delimit the result state, not the whole eventuality. This is demonstrated by examples such as (34a-b).

- (34) a. I gave Bill the car for 3 days.
b. They opened the store for 4 hours on Saturday.

Some further exploration, however, suggests that the picture is not that simple, and immediately raises doubts as to the reliability of the above argument. Consider the contrast between the (a) and (b) versions in (35)-(36), on the result state modification interpretation (the fact that the activity can be modified by the *for*-phrase in the (a) examples is irrelevant).

- (35) a. *?I cleaned the room for a day.
Intended meaning: I cleaned the room so that it will be clean for a day.
b. The room was clean for a day.

- (36) a. *?I dried the towels for a few days.
Intended meaning: I dried the towels so that they will be dry for a few days.
b. The towels were dry for a few days.

(35a) and (36a) sound strange (infelicitous) when the *for*-phrase is interpreted as modifying the result state. The *for*-phrase here does not modify the result but rather coerces a “planned”, “intentionally delimited” interpretation on the part of the Agent. And this interpretation is strange in cases such as (35a)-(36a) since it is not normal to clean or dry something with an intention for the cleaned/dried state to end in a certain period of time. This in turn suggests that a simple (Agent-intention free) statement of the temporal duration of the result state in change of state verbs (the lower eventuality under the syntactic decomposition treatment) is in fact impossible, contrary to expectation.

In contrast, in the periphrastic causative construction, modification of the result state is possible (in the appropriate context). Thus, compare the illicit (36a) with its acceptable periphrastic version (37b). If the transitive verb were syntactically decomposed into a CAUSE constituent and a RESULT one (the state of being dry), one would expect modification of the latter by the temporal *for*-phrase in (37a) to be no less felicitous than in the periphrastic (37b). (37a) is infelicitous because our world knowledge dictates that it is odd/impossible to plan the period of time for which the towels will remain dry. (37b) is acceptable because here the *for*-phrase specifies the period of time during which the towels were dry, without involving the intention of the Agent. The contrast between the two cases constitutes evidence against the claim that the temporal *for*-phrase modifies, and thus diagnoses, a syntactic RESULT constituent in transitive verbs.²²

²² Notice that the contrast between the infelicity of temporal *for*-modification of the result state in (37a) and the felicity of the periphrastic version (37b) cannot be attributed to the fact that the complement in the latter is an infinitival clause (*the towels to be dry ...*), whereas in the decomposed structure of the transitive verb *dry* in (37a), the result state complement is claimed to be a (stative) Small Clause (*the towels dry...*). As shown in (i), stative Small Clause complements denoting result states do permit pure temporal *for*-phrase modification (without intentional/planned duration interpretation), so there is no

- (37) a. *I dried the towels *for (at least) a few days*, by storing/hanging them in a well-ventilated area of the house.
 b. I caused the towels to be dry *for (at least) a few days*, by storing/hanging them in a well-ventilated area of the house.

The above conclusion is further tested and reinforced by data, where the *for*-phrase modification examples are placed in contexts that eliminate the intentional, “planned duration” interpretation, and thus isolate a clear and pure temporal *for*-modification of the result state. Consider for instance the verb *open* in (38). Notice that this verb is actually one of the best-known examples used for demonstrating syntactically decomposed event structure (see e.g. (34b) above).

- (38) I opened the box for a few minutes/for a whole day.

While (38) is fully acceptable, let us consider it in a context that eliminates the interpretation of the Agent having “planned” the temporal limitation specified (39). As in the previous examples, it turns out that the sentence permits no pure modification of the result state of the *opening* event (40a), in contrast with its adjectival counterpart (40b), and periphrastic paraphrase (40c).

- (39) Danny found the big wrapped box that contained the present his parents bought for his birthday. He immediately wanted to see what he was getting, so he opened the box. He took a look at the present, and intended to close the box and wrap it up right away, before anybody noticed. But then he was called to dinner, and later forgot about the open box and went to sleep. He remembered to close it only the following afternoon.
- (40) a. #So Danny opened the box for a whole day (due to his forgetfulness).
 b. So the box was open for a whole day (due to Danny’s forgetfulness).
 c. So Danny caused the box to be open for a whole day (due to his forgetfulness).

Siloni (to appear) observes that a *for*-phrase referring to the result state of transitives is incompatible with an inanimate subject that could not have planned (or determined) the period of time denoted by the modifier. This is illustrated in (41), where the subject *the wind* cannot have planned (determined) an open state lasting for a period of five minutes. This incompatibility further reinforces the present characterization of the temporal *for*-phrase.

- (41) #The wind opened the door for five minutes.

Finally, consider the durative adverb *briefly*. As is clear from (42), it can modify the result state, even when it appears in pre-verbal position. This is unexpected on a

reason why being a Small Clause should cause a problem in (allegedly) decomposed cases, such as (37a).

- (i) While trying out the new lighting system, they accidentally made [the stage-lighting blue for several minutes].

syntactic decomposition account, because in this position the adverb cannot be attached to the lower, RESULT constituent.

- (42) a. The patient briefly opened his eyes.
b. The guard briefly opened the gate.
c. We briefly darkened the room (to be able to see the screen more clearly).

In the next section we provide criteria for delineating the role of the lexicon and the syntax in the theory of argument structure and realization.

4.2 The Litmus test for an active lexicon

We have seen that adverb interpretation does not warrant syntactic decomposition (section 4.1). Furthermore, the need to accommodate arguments and the inability of the traditional θ -roles to capture linguistic generalizations do not provide evidence in favor of syntactic decomposition. This is so because (i) the thematic phase can take care of argument accommodation (sections 3.1, 3.3), and (ii) the feature composition of θ -roles proposed by the Theta System does give rise to natural classes that capture mapping (among other) generalizations across θ -roles (section 3.2). This raises doubts as to whether event decomposition should indeed have been adopted into syntactic structure without further examination.

As mentioned in section 2, Marantz (1997) argues that the “word” does not merit having its own storehouse as it does not define a domain with particular properties. He consequently proposes that the traditional lexicon is a storehouse of roots, and as such cannot be active to the extent that it cannot host derivational operations forming words.²³ Marantz's conclusion is based on his conception of lexicalism as the claim that words are created in the lexicon by processes different from syntactic processes. Unlike Marantz, we do not think that this is a good reason to void the lexicon of its operational role. An active lexicon does not entail that words constitute a domain with particular properties. To decide whether or not the lexicon allows valence changing operations, one should directly examine whether there is evidence that some such operations must apply before syntactic merger has taken place (as explained directly below).

In recent years a series of papers that grew out of extensive work on the lexicon-syntax interface have repeatedly shown that certain valence changing operations must apply before any syntactic merger has taken place. Studies examining various verbal diatheses have shown time after time that certain diatheses must be lexical outputs on the basis of criteria such as (i) their formation makes use of information that indisputably cannot be considered syntactic; (ii) their formation cannot make use of syntactic structure, in sharp contrast with the formation of other diatheses or the formation of the same diatheses in other languages; or (iii) their formation involves an operation illegitimate post-lexically by standard assumptions, but plausibly licit pre-syntactically. Below we briefly throw light on these criteria.

²³ Evidence that the lexicon stores specific thematic instantiations of verbs, i.e., derived lexemes (rather than merely roots) is presented in Horvath and Siloni (2009).

An example for (i) was already mentioned at the end of section 3.2. Horvath and Siloni (2011) show that the set of verbs that can serve as input to causativization (resulting in an Agentive verb) in Hungarian is the class of verbs equipped with a [+] role. Having an external argument is insufficient for an entry to qualify as input, as certain externally mapping verbs can serve as input, while others cannot. What does manage to capture the common denominator to all inputs is the feature composition of their roles, which undoubtedly (its proponents as well as opponents would agree) is not the type of information available to the syntactic component.²⁴

Next, (ii) states that if syntactic structure is inaccessible to the operation, then there is good reason to suspect that the relevant predicate formation takes place prior to syntax. Let us explain the rationale of the argument. Reflexive verbs across languages involve associating their subject with two thematic roles. Thus, for instance, in *John dressed*, John is both the Agent and Theme of the event of dressing. However, in certain languages (Romance languages, West and South Slavic languages) reflexive verbs allow for one of these θ -roles to be the role of a distinct predicate that the syntax merges in the local domain of the reflexive verb (e.g., in its ECM complement). Other languages (English, Hebrew, Hungarian, East Slavic languages) require that the θ -roles associated with the subject of the reflexive verb belong to the reflexive itself (i.e., be part of the same grid, that of the input). This distinction suggests that while in the former languages the reflexive verb is formed in the syntactic component, in the latter it is formed by a lexical operation, which given its locus of application, does not have access to syntactic structure (for a detailed discussion, see Reinhart and Siloni 2005). A parallel argument can be made with regard to reciprocal verbs (see Siloni 2001, 2008, 2012) middles (Marelj 2004), and causatives (Horvath and Siloni (2011)).²⁵

Finally, as stated in criterion (iii), if there is evidence in favor of an operation whose workings are infelicitous or illegitimate post-lexically, but plausible pre-syntactically, then not all operations can be syntactic. Reinhart (2002) and Reinhart and Siloni 2005 argue that the operation forming unaccusative verbs and alternating subject Experiencer verbs eliminates the Cause role of the input altogether. Horvath and Siloni (2011) provide independent motivation for this claim (see also Horvath and Siloni (2013) for additional discussion). Abstracting away here from the specifics of the operation and its justification, let us utilize it to explain the rationale behind the criterion.

Total reduction of a role is at odds with the spirit of syntactic decomposition: It seems senseless to propose a syntactic reduction of an argument if arguments are added by the syntactic component. What could such a proposal mean: adding an argument in

²⁴ Syntactic accounts may try to postulate a particular “flavor” of little v selected by the causative verb, in order to capture what external argument the lexical verb (i.e., the input) must have. But notice that this would not provide a viable alternative account: there is no syntactic head that could reasonably be claimed to introduce Cause, Agent and Sentient arguments ([+] roles that map externally), but exclude Experiencers (a mixed cluster, which in case of subject-Experiencer verbs maps externally).

²⁵ The relevance of the (in)accessibility of syntactic structure to diathesis formation was already discussed by Wasow (1977). Wasow applied the criterion regarding adjectival versus verbal passivization. The evidence in that case, however, only shows that the verbal passive involves syntactic movement while the adjectival one does not. It does not show where the operation on the external argument of the input takes place.

the syntax in order to reduce it altogether? Under approaches that do associate θ -information with lexical entries, eliminating a θ -role post-lexically would violate any version of the principle requiring preservation of lexical-semantic information that entries are equipped with when merged (the traditional Projection Principle of Chomsky (1981) or any alternative formulation). In contrast, we believe that total reduction is not illicit in the lexical component, as explained right below.

On our view (and in contrast with various lexicalist approaches), lexical information does not involve (ordered) λ -representations, e.g., $\lambda y \lambda x \lambda e (break(e) \ \& \ Agent(e, x) \ \& \ Theme(e, y))$. Rather lexical information includes formal, semantic, and thematic (θ -role) features. Let us explain why. The order of the λ -operators in a semantic representation necessarily reflects the order of merging, namely, structural hierarchy. Structural hierarchy, in turn, is not always dictated by lexical information exclusively. Case considerations, for instance, may affect the order of merging. Hence, semantic representations must be read off (composed from) syntactic structure. (Attempting to build the full argument hierarchy into the lexicon would amount to duplicating the syntax in the lexicon.)

Eliminating an argument from a λ -representation seems problematic. This is the rationale behind views (made explicit by Koontz-Garboden (2009) in his Monotonicity hypothesis) that consider removal of roles from lexical-semantic representations impossible. But if lexical entries do not involve λ -formulas, nothing blocks role reduction in the lexicon, which forms a new lexical entry (derivationally related to the input). For some more argumentation along these lines, see Dimitriadis (2012). Thus, if there indeed is an operation of total reduction, it has to apply in the lexicon.

Note that in contrast to the above hallmarks identifying operations that must be pre-syntactic, the assignment of lexical status to operations in earlier literature has often relied merely on manifestations of various idiosyncrasies in their application (i.e., on the existence of gaps in the paradigm, or special meanings exhibited by input or output). Thus, it is worth pointing out here that the force of the above diagnostics is crucially distinct. While the existence of idiosyncrasies is of course fully consistent with a particular operation being lexical, there are ways of capturing them also within models placing all operations in the syntax. Marantz (1997, 2001), for instance, proposes that such idiosyncrasies can be accounted for as effects typical of the local domain of the root, which constitutes a derivational phase. Specifically, the root phase is claimed on Marantz's theory to be comprised of the root and its syntactic domain up to the point where the first category-determining head is merged. Thus, assuming that the root is the source of idiosyncratic information, only heads within the root's phase will have access to it; beyond the root phase, the derivation will be predicted not to exhibit idiosyncrasies. Independently of the question whether idiosyncrasies indeed are limited to the root phase, observe that reliance on domains in a layered syntactic structure (such as the root phase and beyond) cannot deal with findings regarding information or mechanisms that ought to be pre- or post-syntactic by nature.

The above are just a handful of examples for the type of direct evidence that should enable linguists to determine whether or not the lexicon allows valence changing operations and must consequently list actual predicates (verbs, adjectives etc.) with their thematic information. We believe evidence of this type strongly suggests that the lexicon is active. We are thus convinced that linguists must examine such evidence

thoroughly before they commit to approaches discarding lexical operations. The reader is referred to Fadlon (2012), Horvath and Siloni (2008), Horvath and Siloni (2009), Horvath and Siloni (2011), Hron (2011), Marelj (2004), Meltzer (2012), Reinhart (2002), Reinhart and Siloni (2005), Siloni (2002, 2008, 2012) for arguments in favor of lexical operations.

Appendix: Special meanings and the external argument

A predecessor of the syntactocentric approach, representing an initial step in the direction of syntactic decomposition, was the proposal to sever the external argument from the lexical verb. This approach, developed in the mid '90s, introduced the external argument into syntactic structure via a separate (functional) head, e.g. Kratzer's (1996) Voice head or Chomsky's (1995) little-*v*. Below we will briefly examine the motivation and empirical merits of this proposal. Note that the direct syntactic insertion of the external argument apparently acted as a catalyst for the move towards full syntactic decomposition. The proposal has had direct implications as to the (im)possibility of certain lexical operations: it makes the prediction that the external role cannot be involved in any lexical operation affecting the lexical verb, as it is not part of the verb's lexical entry. This implication clearly conflicts with results of recent studies arguing that a number of independently motivated lexical operations must involve the external role of verbs, e.g., reflexive verb formation (Reinhart and Siloni 2005), reciprocal verb formation (Siloni 2008, 2012), middle formation (Marelj 2004), and causative formation (Horvath and Siloni 2011) in certain languages, and reduction of the external role (Reinhart 2002) (alias decausativization) across languages.

The arguments cited for eliminating the external role from the lexical verb's theta-grid were based on two related long-standing generalizations regarding special meanings (originating in Marantz 1984): (i) the asymmetry of semantic composition between the external versus internal arguments, and (ii) the (alleged) non-existence of subject idioms. Generalization (i) captures the observation that the choice of the internal argument can affect the interpretation of the verb, and hence the interpretation assigned to the external argument (subject), but the choice of the external argument cannot do that. For instance, the interpretation of the verb in cases such as (43), (44) below varies with the choice of internal argument, which in turn influences the interpretation of the subject. In contrast, no instances seem to exist where the choice of subject would have a comparable effect on the meaning of the verb and hence on the interpretation of the internal argument (Marantz 1984).

- (43) a. John killed a cockroach.
b. John killed an hour/an afternoon.
c. John killed a bottle/the wine.
- (44) a. John took a pen.
b. John took a pill/some vitamins.
c. John took a bus/the train.

The closely related generalization (ii) involves an asymmetry of idiom formation, and specifically, is based on the set of verb phrase idioms made up of a verbal predicate

and (some of) its arguments. The claim due to Marantz (1984) is that although English has many idioms consisting of the verb and an internal argument (e.g., *pull strings*, *spill the beans*, *kick the bucket*, *saw logs*), there are no verb phrase idioms consisting of the verb and the external argument excluding the internal argument.

It is the above semantic asymmetries that led researchers in the mid '90s to conclude that the external argument cannot be an argument of the lexical verb, and inspired the postulation of a variety of functional heads to introduce it outside the verb's maximal projection. A closer examination of the above observations reveals that they do not warrant such a conclusion.

Addressing the issue of how the external argument could be prevented from affecting the meaning of the verb the way its internal counterpart does, (i.e., how to account for the difference between the internal versus the external argument regarding the ability to affect verb denotations), Kratzer (1996) notes that semantics in principle allows arguments of the same predicate to impose special meanings on the predicate irrespective of order of semantic composition in the sentence.²⁶ Specifically, her argument is that if both the external and the internal argument were arguments of the lexical verb, then it would be impossible to preclude restricting the function (that is the verb's denotation) based on the external argument, but not based on the internal argument. If so, particular choices for the external argument or for the internal argument would be equally able to impose special meanings on the verb, contrary to fact. This conclusion leads Kratzer to propose that the external argument must then be an argument of an independent predicative head and this is the reason why it cannot access the lexical verb and affect its meaning.

Severing the external argument from the lexical verb, and stipulating an extra (functional) head (vP or $voiceP$) to introduce it raises the issue of how to integrate the two phrases in semantic interpretation. Kratzer's system achieves this via "Event Identification", a process that combines the denotations of VP and vP . This is meant to take care of the interpretation of e.g. *John killed a cockroach*, along the following lines: there is a "causing" event and a "killing" event, and *John* is the Agent of the "causing", *a cockroach* is the Patient of the "killing", and the "causing" and the "killing" are the same event (after Event Identification); i.e., using a rough paraphrase, John caused the killing of a cockroach.

But there needs to be more to the VP - vP relation than this. Not only the type of event, or the type of external role, specified by the v head needs to be compatible with the interpretation of the lexical VP , but semantic selectional relations holding between the lexical verb and the external argument also would need to be specifiable. Thus

²⁶ The representation of special interpretations such as in examples (43a) versus (43b), under the "traditional" view that *kill* is a two-place verb, is assumed by Kratzer (1996) to look like (i) and (ii), respectively:

- (i) $KILL_1$ is a function that takes an argument x and turns out a function that takes another argument y and turns out:
truth value= TRUE iff x is an animate being and y **kills** x
- (ii) $KILL_2$ is a function that takes an argument x and turns out a function that takes another argument y and turns out:
truth value=TRUE iff x is a time period and y **wastes** x

consider the following selectional phenomena involving the external argument of the transitive verbs in (45):

- (45) a. The bees stung John.
b. *The bees bit John.
c. The snake/the mosquito bit John.
d. *The snake/the mosquito stung John.

These distinctions cannot be attributed to the nature of the external role, which is uniformly an Agent in (45a-d). To capture such phenomena, one would have to allow the process of event identification to specify the (fine-grained) semantic restrictions that the lexical VP imposes on the external argument in the *v*P. But whatever mechanism is employed to achieve this will automatically also make possible the specification of various semantic restrictions on the meaning of the verb based on the choice of the external argument. Event identification has to reconstruct all the lexical-semantic restrictions imposed by the traditional V (which bears the external role). So the question still is: what could be the reason that while the external argument is accessible to selection by the lexical verb (45), it apparently cannot itself affect the interpretation of the verb. Introducing the external argument via a separate head thus turns out to be unable to explain the observation for which it was designed. With or without a “little *v*” type projection, the question remains: Why do lexical-semantic restrictions seem to be bottom-up – from the verb+internal argument to the external argument – and not the other way around (i.e., from verb+external argument to internal argument)?

We claim the asymmetry in the effect the internal versus external argument has on special meanings exhibited by verbs ((43)-(44)) stems from the way verbs acquire such special meanings in the first place. As these new meanings evolve based on the conventionalization of compositionally interpreted syntactic structures, the resulting verb denotations reflect the hierarchical syntactic asymmetry between the external and internal argument. The development of special meanings (such as those in ((43)-(44))), just like the development of phrasal idioms, happens via a conventionalization process of particular interpretations that have been used consistently in specialized contexts. We believe that semantic composition proceeds gradually, along the syntactic derivation, assembling step-by-step the interpretations of successive structural units. The internal argument merges with the selecting lexical verb before the external argument does and thus, the two form an interpretative unit. We therefore expect that these V + internal argument units will be able to develop special and idiomatic meanings productively. The external argument is higher in syntactic structure than the internal arguments even without a stipulated extra functional head. Under our approach, it is merged last, at the edge of the thematic phase (see section 3.3).²⁷ Therefore, there is no interpretative unit composed only of the verb and the external argument that excludes the internal one.²⁸ We claim that this is reflected in the

²⁷ It is worth noting here that the proposed step-by-step compositional procedure does not mean that the range of external arguments could not be restricted by the selecting lexical verb (as in (45) above). On the contrary, selectional phenomena regarding the external argument are straightforward to state under our proposal: they are imposed by the interpretative unit V + internal argument.

²⁸ In a somewhat different context, Bresnan (1982) and Grimshaw (1990) also claimed that the asymmetry in question is due to the order of semantic composition of the external versus the internal arguments (and thus it does not conflict with considering the subject a true argument of the verb). Their

lexicalized outcomes of conventionalization processes, such as special meanings. It is thus expected that special verb meanings (and also phrasal idioms) involving V + external argument, and excluding the internal argument, will not arise productively.

If our account is on the right track, then contra Kratzer's claim, the observed asymmetry of verb meanings provides no reason to sever the external argument from the lexical verb. Importantly, notice that our proposal diverges from Kratzer's in an interesting way in its predictions for special verb meanings in the case of one-place verbs (the Marantz-Kratzer argument relied only on the behavior of transitive verbs). Specifically, let us consider here briefly the case of one-place unergatives. As Kratzer's account of special verb meanings relies on the external argument not being an argument of the lexical verb, it predicts that the subject of unergatives, being an external argument, will behave exactly as the external argument of transitives with respect to special meanings: namely, it will not give rise to special meanings. In sharp contrast to this, our proposal, which takes the external argument to be an argument of the lexical verb, predicts that the external argument of unergatives will be able to give rise to special verb meanings. This is so since unlike transitives, unergatives have no other, structurally closer argument composing with the verb.

The following examples of unergative verbs exhibiting special meanings (46)-(47) seem to bear out our prediction, and poses a challenge/problem for accounts severing the external argument from the lexical verb.

- (46) a. The boys ran.
 b. The engine/the printer ran.
 c. The hot water ran.
 d. His nose ran.
 e. The colors of the fabric ran.
- (47) a. The geese/the plane flew.
 b. John/the patient flew.
 c. Bullets flew.
 d. Insults/rumors flew.
 e. Time/the days flew.

Next, turning to the claim regarding subject idioms, a further look at the set of V + argument idioms shows that, contrary to the commonly assumed generalization (ii), we do find (a small number of) external arguments in such idioms. The following examples, from three unrelated languages, demonstrate that the external argument is not precluded from occurring within verbal idioms.

- (48) a. *a little bird* told me that X
 b. *Lady Luck* smiled on X

- (49) a. elkapta X-et *a gépszíj* (Hungarian)
 caught-3sg.DEF. DO X-ACC the driving-belt. NOM

claim is explicitly dismissed by Kratzer (1996), on the grounds that the order of semantic composition is a matter of the syntactic derivation, while the observed asymmetry is a generalization about existing versus non-existing verb meanings. Our proposal, based on the syntactic (compositional) origin and evolution of special lexical meanings, is not subject to this objection, as explained in the text.

and indicates the existence of some further, independent factor contributing to the scarcity of idioms containing the external argument.

This further contributing factor appears to be the conjunction of two general cognitive preferences. First, as observed by Nunberg, Sag and Wasow (1994), idioms describe abstract situations in terms of concrete ones and not vice versa. The second relevant fact is claimed by Nunberg, Sag and Wasow to be that animate noun phrases tend to preserve their animacy in metaphoric and idiomatic meanings. We suggest here a refinement. We draw a distinction between noun phrases denoting *human* versus those denoting *non-human* animates (animals). Non-human animates occur in idioms, often denoting abstract entities (such as in: *beat a dead horse*, *throw someone to the wolves*, *let the cat out of the bag*, *smell a rat*, *cook someone's goose*, *put the cat among the pigeons*, *kill two birds with one stone*, *take the bull by the horns*). In contrast, human-denoting noun phrases are essentially unable to refer to non-humans, and consequently unable to stand for abstract entities.³⁰ It is the conjunction of the above two cognitive principles that is the additional factor contributing to the scarcity of external arguments within idioms. Since the external argument is predominantly human, and since humans preserve their [+human] nature, they can hardly be used to describe abstract entities to fit idiomaticity. It follows that the external argument rarely appears in the fixed part of idioms (quantitative data regarding this hypothesis is provided in Nunberg, Sag and Wasow (1994)). This account is supported by the fact that Goal-Recipients (Kiparsky 1987) and Possessors (Marantz 1984) – which are not external arguments – are also rare in idioms. Since the latter are also characteristically human, their nonoccurrence in the fixed part of idioms is predicted.

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³⁰ Only a couple of sporadic instances of idioms can be found where a [+human] noun occurs referring to an abstract entity. Our informal survey turned up *baby* in the idiom *throw out the baby with the bathwater*, and possibly *devil* (if considered [+human]), in idioms such as *the devil is in the detail*.

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