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Meaning, metaphor, and argument structure[1]

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This paper challenges what it calls the SEMANTIC DETERMINIST HYPOTHESIS (SDH) of argument licensing, according to which the syntactic realisation of a verb's arguments is a function of its semantic properties. Specifically, it takes issue with 'event schema' versions of the SDH applied to the English ditransitive alternation (*give/send* {*Jesse the gun/the gun to Jesse*}), which claim a systematic, syntactically predictive distinction between 'caused possession' and 'caused motion'. It is first shown that semantic and syntactic irregularities among the alternating verbs disconfirm such a mapping. More crucially, however, it is argued that 'non-prototypical' (metaphorical and idiomatic) usage (*The news report gave Walt an idea*, *Walt's actions gave the lie to his promises*, *The discovery sent Jesse into a fury*) is fatal to the SDH, since the hypothesis entails the existence of SEMANTIC CONSTRAINTS on argument realisation which these expressions violate.

Based on an analysis of the semantically-related verbs *give*, *send*, and *put*, it is claimed that prototypical, metaphorical and idiomatic expressions of a verb can all be licensed straightforwardly, but only if theory maintains separate syntactic and semantic representation of arguments in lexical entries, observing the 'parallel architecture' of Jackendoff (1997, 2002), and only if argument tokens are licensed by the syntactic representation alone. A type of structure called a LEXICAL ARGUMENT CONSTRUCTION is proposed, which can describe all the relevant properties of verbs and verbal idioms.

KEYWORDS: argument structure, construction grammar, ditransitive, double object, idioms, metaphor

1. INTRODUCTION

Many theories of argument structure have assumed some version of what is called here the SEMANTIC DETERMINIST HYPOTHESIS (henceforth SDH), which takes the licensing of a verb's arguments to be a function of its SEMANTIC properties and which therefore eliminates explicit SYNTACTIC representation of those arguments in lexical entries. One version of the SDH uses 'predicate decompositions' or 'event schemata', which have been claimed to overcome the shortcomings of

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'role'-based theories.[2] Pinker (1989) applies such an approach to the problem of 'syntactic alternations' in English, which includes the ditransitive, manifested by *give* and related verbs. Consider the verbs in (1) and the corresponding syntactic structures in (2):

(1) (a) Walt {gave/promised/showed/sent} Jesse the gun.
(b) Walt {gave/promised/showed/sent} the gun to Jesse.

(2) (a) [NP V NP_i NP_j]
(b) [NP V NP_j [P NP_i]][3]

According to Pinker, there is a single 'caused possession' event underlying the verbs in (1a), while in (1b) they instantiate 'caused motion', such that there is an isomorphic mapping between the respective semantic and syntactic structures. Pinker's thesis expands on Green's (1974) claim that there is an 'animacy constraint' on the indirect object of (2a) that does not feature in (2b). This putatively criterial semantic difference has formed the basis of many subsequent syntactic analyses of the ditransitive (e.g. den Dikken 1995, Harley 2003, Beck & Johnson 2004).[4]

Rappaport Hovav & Levin (2008) challenge an important part of this apparent consensus. They defend a (much) weaker variant of the hypothesis, according to which *give*, *promise* and *show* are 'caused possession' verbs in both syntactic variants. Of the verbs in (1), only the indirect object form of *send* can express a 'Path' or 'Goal', providing evidence of a 'caused motion' sense (3a, b) distinct from 'caused possession' (4a, b):

(3) (a) Walt sent/*gave/*promised/*showed the drugs {all the way to Mexico/into the desert/over the border}.
(b) Where did Walt send/*give/*promise/*show the drugs?

[2] The SDH is similar to the 'Semantic Base Hypothesis' (Koenig & Davis 2006), which the authors seek to defend, and a manifestation of what Newmeyer (2001) calls the 'Deep Alignment Hypothesis', which he argues is mistaken. Levin & Rappaport Hovav (2005: Chapters 2 and 3) assess the limitations of role-based approaches and the attempts in the literature to overcome them.

[3] The structure in (2a) illustrates what for convenience I refer to throughout as a 'double object'; (2b) illustrates the 'oblique'. The subscripts track the exchange of argument positions between the variants. Again for ease of reference only, the initial NP is called the 'subject', NP_i the 'indirect object', and NP_j the 'direct object'.

[4] In transformational generative grammar (TGG), interest in the ditransitive has borne mainly on questions concerning its proper syntactic 'projection', i.e. on how its (initial) syntactic structure is represented (see the survey in Emonds & Whitney 2006). The significance of the SDH for TGG can be understood as lying partly in its potential 'explanatory' power (see Pesetsky 1995), partly in its fit with the general trajectory of the framework towards minimising (perhaps exorcising entirely) the role of the lexicon in grammatical computation (see Culicover & Jackendoff 2005 for discussion).

The SDH is, of course, not universally assumed. 'Declarative' frameworks such as Head-driven Phrase Structure Grammar (HPSG) and its offshoot Sign-Based Construction Grammar (SBCG) (Sag 2012) formally represent syntactic argument properties in lexical entries. It is no accident that the SDH's 'derivational' nature is so closely related to the development of TGG.

(4) (a) Walt sent/gave/promised/showed {Gus/#Mexico/#the desert/#the border} the drugs.[5]

(b) Who did Walt send/give/promise/show the drugs to?

Although their conclusion that only *send* and related verbs are polysemous is convincing, this paper maintains that Rappaport Hovav & Levin fail to support the SDH for the other verbs in (1). First, their 'verb-sensitive' proposal is nothing like sensitive enough. Unlike *give* itself, there is no evidence that either *promise* or *show* have an underlying 'caused possession' event, i.e. that their indirect objects are 'Possessors' or 'Recipients'. It is concluded that the verbs undergoing the ditransitive alternation are too semantically heterogeneous to support even their substantially weakened form of the hypothesis.

More seriously, their paper glosses over what is claimed here to be a fundamental flaw with the SDH. Both role- and event-based approaches implicitly assume that the constraints the theory needs to describe are exemplified by sentences such as (5):

(5) (a) Walt gave Jesse the flask.

(b) Walt gave the flask to Jesse.

Examples of this sort intuitively represent 'prototypical' usage, since they best illustrate the 'literal' meaning of *give*: an event of volitional transfer of some concrete entity from one animate participant to the other. As argued in this paper, the sense of semantic prototypicality arises from sentences involving argument TOKENS which instantiate the semantics of the verb's argument TYPES, which can be conventionally characterised by the role array <Agent, Recipient, Theme>, assigned respectively to subject, indirect object, and direct object positions.[6]

But the semantic properties of argument types and argument tokens do not always align, something which becomes clear once we consider examples such as the following:

(6) (a) Walt gave Jesse **another chance**.

(b) Walt gave **subtle encouragement** to **the idea that he might die**.

(c) **Being a drug lord** gave Walt **a feeling of power**.

(d) **Fear** gave **intense urgency** to **Walt's efforts to control Jesse**.

(e) Skyler gave Walt **a hand**.

(f) **Walt's odd behaviour** gave Skyler **the creeps**.

(g) **The discovery** gave **the lie** to **Walt's story**.

These examples have various 'metaphorical' senses, because each expression contains at least one argument token (in bold) whose inherent semantics is at odds

[5] The symbol # is used throughout to indicate 'semantically anomalous', as opposed to 'grammatically ill-formed', for which the conventional * is used.

[6] TOKENS of arguments are instances of use, instantiating TYPES, which are abstract arguments in lexical entries, both semantic (e.g. 'animate') and syntactic (e.g. 'NP').

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with that of the verb's corresponding argument type. If the Theme is the 'entity which moves', then in contrast to *the flask* in (5), none of the NP direct objects in (6a–d) seem to qualify as such, since they are all abstract entities, while the subjects of (6c, d) and indirect objects of (6b, d) do not make good Agents or Recipients because they do not denote animates. The pattern of semantic non-alignment is complicated further by the idioms (6e–g), whose 'open' indirect object position seems to be assigned an idiom-contingent role: although they are animates, *Walt* in (6e) is more like a Beneficiary, and *Skyler* in (6f) is more like an Experiencer.[7]

Although Rappaport Hovav & Levin (2008) implicitly claim that their 'caused possession' hypothesis accounts for 'all' uses of *give*, it is argued here that it does not account for the phenomena illustrated in (6). Nor can it in principle: the SDH entails that syntactic arguments are derived via semantic constraints, but metaphorical expressions, like those illustrated, violate those constraints, and so ought not to be licensed. Yet even the idioms of (6e–g) are strikingly unexceptional in their SYNTACTIC structure. If semantically 'divergent' usage does not violate truly GRAMMATICAL constraints, then semantics cannot be the source of these – clearly in direct contradiction to the SDH.

This paper argues that it therefore NECESSARY to encode syntactic and semantic argument types as strictly separate components of lexical entries, as in Jackendoff's (1997, 2002) theory of lexical structure. Furthermore, semantic argument types do not determine constraints on argument tokens: constraints on argument realisation are purely syntactic. This hypothesis fits naturally with the analysis of metaphor in Sullivan (2013), central to which is the division of semantic 'domains' between a 'source' and a 'target', the source of a verbal metaphor being provided by the verb and its argument types, and the target by at least one of the verb's argument tokens. In this paper, the salient verb properties are encoded in a structure called a LEXICAL ARGUMENT CONSTRUCTION. This device is claimed not only to license an unbounded set of argument tokens (thereby licensing metaphorical uses without stipulation), but also to be straightforwardly extendable to the licensing of idioms as 'lexicalised metaphors'.

The paper is organised as follows. Section 2 defines the SDH and sketches its development in generative grammar. It also shows that role- and event-based forms of the hypothesis equally entail constraints on the semantic properties of argument tokens ('selectional restrictions'). Section 3 analyses the serious empirical problems of the 'strong' and 'weak' variants of the SDH applied to the ditransitive, represented respectively by Pinker (1989) and Rappaport Hovav & Levin (2008). Section 4 presents the alternative hypothesis concerning lexical entries and their relationship to argument tokens, and analyses the syntactic and semantic properties of three related verbs: *give*, the polysemous *send*, and *put*, which has properties in common with both verbs. It is shown that it is the status of

[7] A similar phenomenon was observed by Marantz (1984): the role assigned to the subject can be a function of the verb and its (idiomatic) object (as in e.g. *John threw a ball*/*John threw a fit*).

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these properties as types interacting with tokens which explains the phenomena of corresponding metaphorical and idiomatic expressions. Section 5 introduces the Lexical Argument Construction, a Construction Grammar-type structure which formalises the required phonological, semantic and syntactic properties of a lexical verb and is claimed to provide an adequate constraint-based theoretical description of the data. Section 6 briefly discusses the notion of 'predictability' in the grammar. Section 7 concludes.

2. THE 'SEMANTIC DETERMINIST HYPOTHESIS'

This section defines the SDH in general terms, and briefly surveys its development in generative grammar (Section 2.1). Section 2.2 examines the implications of such 'purely semantic' specifications of argument structure for argument realisation.

2.1 *Origins and development of the SDH*

'Semantic determinism' is defined here as any hypothesis concerning verbal argument structure whereby there is a mapping from (some level of) a verb's semantic representation to the syntactic form of its arguments, such that syntactic representation of those arguments does not feature in the verb's lexical entry.[8]

Semantic constraints on argument realisation were present in early transformational generative grammar (TGG) (Chomsky 1965), but they were CO-CONSTRAINTS on 'lexical insertion'. A lexical predicate of category V (say, *sense*) both subcategorised for the number and syntactic category of its complements (7a), and also specified 'selectional features', which placed constraints on the INHERENT SEMANTIC PROPERTIES OF THE HEAD of all its arguments (7b):

(7) (a) *sense*, V, [+ __ NP]
(b) [+ANIMATE] __ [+ABSTRACT]

Note that, in isolation, a subcategorisation frame such as (7a) is sufficient to license an UNBOUNDED set of complements, as long as their categorial features match those stipulated in the frame. However, the addition of the features (7b)

[8] As Levin & Rappaport Hovav (2005: 3) phrase it, 'many current theories of grammar assume that the syntactic realization of arguments is predictable to a large extent from the meaning of their verbs'. Much hinges on what is understood by the word 'predictable' here, but the salient characteristic of the SDH for this paper is the absence of a SYNTACTIC argument structure representation from the lexical entry of a given verb and its substitution by SEMANTIC principles of some kind, which (regardless of the details) will entail the problems analysed in this and the following section. Herzig Sheinfux, Melnik & Wintner (2017) do not adhere to the SDH, since they preserve both syntactic and semantic argument representations, although it is a moot point whether the 'expressive' generalisations about semantic argument types they seek to capture need to be stated in lexical entries themselves. A theory of 'argument realisation', grounded in general semantic or cognitive principles, which constrains the notion 'possible argument structure' in Universal Grammar, does not conflict with a rejection of the SDH either: see Section 6 for some discussion.

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constrains the set of argument tokens licensed for a particular position to a certain subset, in order to putatively block the generation of a sentence like *danger senses Walt*.[9]

The development of the Government and Binding (GB) theory (Chomsky 1981) crucially changed the relationship between selection and subcategorisation, by establishing the principle that the former is a NECESSARY condition on the latter, following Stowell (1981), whose 'θ-grid' listed verbal arguments in the form of semantic ('theta') roles. Most subsequent GB work made the *de facto* assumption that theta roles are SUFFICIENT determinants of the number and category of syntactic arguments; finally, the UTAH (Uniformity of Theta Assignment Hypothesis) of Baker (1988) put in place a semantic constraint on their mapping to syntactic positions.[10]

Given well-documented problems with theta roles, which in GB were essentially conceived of as a universal list of semantic categories, some researchers (e.g. Jackendoff 1987, Rappaport & Levin 1988) have concluded that theta roles are not primitives of lexical entries, but are better understood as derived notions, being defined over lexical structure itself. In the TGG framework, 'lexical decompositions' have been formalised syntactically (following Hale & Keyser 1993), with primitive predicates such as CAUSE and HAVE analysed as heads and projecting into structures defining argument positions, while in lexicalist alternatives (e.g. Levin & Rappaport Hovav 1995), such predicates combine into 'event schemata', which define semantic argument positions, which in turn putatively map to syntactic positions.[11] But the criterial underlying claim of both approaches is equivalent: abstract semantic elements define 'configurations' from which the syntactic expression of surface arguments can be derived.

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[9] McCawley (1968) demonstrated that putative semantic restrictions cannot apply solely to heads, since modifiers can affect the properties of an entire phrase:

(i) (a) My (#buxom) neighbour is the father of two.
(b) The arm (#of the statue) is bleeding.

McCawley (1971) argued more fully that apparent 'selectional restrictions' are predictable from knowledge of verb meaning, and do not need to be encoded in the grammar – a view endorsed by the present proposal.

[10] Chomsky (1986) relabelled subcategorisation 'c-selection' and hypothesised that 's(emantic)-selection' may render it redundant. Stowell had not proposed that subcategorisation frames be eliminated, merely that theta roles 'license' them, based on the claim that a lexical verb can take a complement only if it assigns that complement a role. This claim is challenged, though, by idiomatic constructions which have semantically empty pronouns they nonetheless must subcategorise for: *Do you take *(it) that I'm wrong? *What*$_{\text{i}}$ *do you take* t_{i} *(that I'm wrong)?* In addition, 'raising to object' constructions have subcategorised (and case-marked) positions that do not have to receive a role at all: *I believe *(him) to have died/I believe *(there) to be a good reason*.

[11] Whereas in GB, the mapping was constrained by the UTAH, in the lexicalist alternatives, according to Levin & Rappaport Hovav (2005), it is performed by 'algorithms'. But although they cite a handful of (question-begging) informal rules or principles in the relevant part of their book (Chapter 5), there is nothing that formally resembles an algorithm. In the literature, elaborated, precise and testable formulations of mapping rules are hard to find.

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2.2 *Implications of the SDH for argument realisation*

Jackendoff (1987) argues that if theta roles are relational notions defined over a verb's conceptual structure (an autonomous level of representation), then they must be determined by a verb's individual meaning. He points out that there are many verbs whose theta roles cannot be captured by conventional labels (e.g. the direct objects of *pass*, *jump*, *climb*), and there is the related fact that 'selectional restrictions' can often only be stated in terms of highly specific semantic types (a liquid in the case of *drink*, a sum of money with *pay*).[12]

Such a conclusion sits uncomfortably with the SDH, even a version based on lexical decomposition. Since the semantic representation is supposed to derive the properties of syntactic arguments, it must embody semantic constraints in such a way that syntactic properties 'fall out' from them.[13] Unlike for Jackendoff (or Chomsky 1965 for that matter), the constraints must generalise: they should define sets of syntactic argument structures (and the lexical membership of those sets) independently of the individuating semantic properties of their members (verbs). This necessity arises from the obvious fact that, although there are thousands of lexically distinct verbs, there are relatively very few syntactically distinct argument structures. Much of the literature on semantic roles has therefore been devoted to tackling the problem of defining the nature of roles in such a way as to adequately predict the mapping.

The price that is paid for this gain in generality, however, is the loss of (potentially criterial) semantic distinctions between verbs which may result in an 'event schema' that fares no better than a list of theta roles. To see why, compare the paired configurations of theta roles in (8) with the corresponding event schemata in (9), which on 'strong' versions of the SDH map directly to the ditransitive double object and oblique structures respectively:

(8) (a) <Agent, Recipient, Theme>
(b) <Agent, Theme, Goal>

(9) (a) [x CAUSE [Y HAVE Z]]
(b) [x CAUSE [Z GO TO Y]]

[12] An important caveat is that Jackendoff assumes the theory must still treat selectional restrictions as item-particular constraints on semantic well-formedness; his Section 6 addresses the question of how this can be done given his assumptions. However, these constraints do not derive the subcategorisation features, which are independently stipulated (see Jackendoff 1990).

[13] The constraints must also cut both ways. For example, if a verb's Agent theta role derives its NP subject, it cannot be the case that its NP subjects are not Agents:

(i) John put some chilli in the sauce (to improve the flavour/please Mary).
(ii) The chilli put some heat in the sauce (#to improve the flavour/please Mary).

Clearly the NP subject of (ii) does not have the agentive properties (animacy, volitionality) that (i) has.

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While the roles in (8) are simply stipulated, the roles of the variables in (9) are defined in relation to the semantic 'predicates' of which they are 'arguments'. But the roles themselves are equivalent: for example, Y is the entity that is 'caused to have Z' in (9a), but the entity to which Z is 'caused to go' in (9b); in other words, Y is a Recipient in (9a), but a Goal in (9b). Hence the empirical adequacy of an event schema in predicting the mapping from semantics to syntax is still valid only to the extent that the roles it defines accurately capture the salient semantic properties of all the verbs in a syntactically-defined set.

Moreover, it is not enough to say that roles are just relations defined by a predicate: they also invoke certain semantic argument types ('conceptual categories' in Jackendoff's terms). For example, Recipients must be conceptually distinct from Goals, so there must be inherent semantic properties that distinguish them, namely that Recipients must be animate (capable of 'receiving'), whereas Goals (understood as the 'endpoint of a path') need not be, and the Theme of (8a) (Z in (9a)) must be an entity with properties enabling it to be 'received'. In this way, both configurations in (8) and (9) must determine 'selection' of candidate argument tokens according to what semantic properties they bear. Thus the SDH entails 'selectional restrictions' which constrain licit argument tokens to a subset of the syntactic types licensed by subcategorisation alone, just as in Chomsky (1965).

3. Empirical problems of the SDH: The ditransitive alternation

This section identifies two different kinds of empirical problem the SDH faces as applied to the analysis of the ditransitive alternation. Section 3.1 critiques what is called here the 'strong' hypothesis. This holds that a particular syntactic argument structure is a function of semantic class, so all verbs in one semantic class will have one argument structure; therefore, if a verb shows an argument structure alternation, then each argument structure is associated with a distinct semantic class. Although there are many variations on this hypothesis, it is best exemplified by the detailed lexicalist study of Pinker (1989).[14] Section 3.2 turns to the 'weak' hypothesis of Rappaport Hovav & Levin (2008), which derives the alternation of only *send*-type verbs from distinct semantic classes, *give*-type verbs belonging to

[14] Goldberg (1995) may be understood as a 'constructional' application of the SDH. The event schemata are already encoded in her (autonomous, phonologically empty) 'constructions', so the 'mapping problem' becomes a question of what 'fuses' a verb with the right construction(s). But because of the divergence between the putative 'central sense' of the ditransitive (double object) construction and the semantics of many of the verbs that appear in it, Goldberg posits a family of polysemous constructions remarkably similar to Pinker's lexical subclasses – see Goldberg (1995: 38) – despite inveighing against the 'implausibility' of postulating 'multiple verb meanings' (the 'strong' lexicalist position), and despite the absence of any overt reflexes of 'constructional polysemy'. Her Chapter 6 acknowledges that metaphorical expressions (obscurely referred to as a 'delimitable class') violate her constructional constraints, but proposes that these are 'extensions' licensed by various metaphors. It is unclear what, if anything, distinguishes these 'extensions' of use from different 'constructions'.

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only one semantic class. However, it is shown that the SDH, even if applied to only a single verb, cannot account for 'all uses' of that verb as claimed.

3.1 *The 'strong' hypothesis*

Pinker's (1989) hypothesis can be schematised as follows:

(10) (a) [x CAUSE [Y HAVE Z]] ⇒ [NP V NP_i NP_j]

⇕

(b) [x CAUSE [Z GO TO Y]] ⇒ [NP V NP_j $_{PP}$[to NP_i]]

As can be seen, there are two kinds of mapping rule: one maps a particular event schema to a particular syntactic structure, and another converts one schema into the other. In order to explain why the second rule is not completely productive (why some verbs do not entail both structures), Pinker proposes various semantic subclasses of ditransitive verb, membership of a certain subclass being a condition for the triggering of the rule.

Pinker's proposal amounts to a claim that all alternating ditransitives manifest a systematic difference of meaning between their use in the oblique and their use in the double object. However, Rappaport Hovav & Levin (2008) demonstrate that a 'caused motion' semantics entails a Path argument, which surfaces as a PP with a variable head, or as the locative pro-form *where*, but that this is manifested only with a subset of the alternating ditransitives (examples adapted from theirs):

(11) (a) I threw/kicked the ball {halfway to Maria/behind the tree/over the fence}.

(b) I sent the package {halfway to Antarctica/over the border/into space}.

(12) (a) Where did you throw/kick the ball?

(b) Where did you send the package?

By contrast, verbs in Pinker's other subclasses ('giving', 'future having', and 'communication') do not have a Path argument: the alternating verbs allow only PPs headed by *to*, and these indirect objects cannot be questioned with *where*:

(13) (a) I gave/offered/showed the ball {*halfway to Maria/*behind the tree/*over the fence}.

(b) *Where did you give/offer/show the ball?

Rappaport Hovav & Levin conclude that these other verbs have only a 'caused possession' meaning even in their oblique form.

But even this conclusion is too strong, for three main reasons. First, it is predicted that the indirect objects of all verbs based on a 'caused possession' schema will bear the role of Recipient, yet unlike the 'verbs of giving' (14a), neither *show* (included in Pinker's 'communication' subclass) nor any of the 'verbs of future having' (14b) have this entailment:

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(14) (a) Skyler received the money by Walt giving/passing/handing/lending it to her.

(b) #Skyler received the money by Walt showing/offering/promising/owing it to her.

The *by*-phrase is anomalous in (14b) because, as sporadically observed in the literature, although giving something to somebody entails that they receive it, a person cannot receive something simply by having it shown, offered, promised, or owed to them. Therefore a 'caused possession' sense for these verbs is unsubstantiated.[15]

Second, Pinker's 'future having' and 'communication' subclasses are not syntactically valid because they are not, in fact, semantically coherent. For example, although causation is a basic component of the event schema, *owe* is a stative, not causative verb (*Walt tried to offer/promise/#owe Skyler her freedom*). Moreover, the 'communication' verbs show a lack of homogeneity among the semantic argument types associated with the DIRECT object. *Show* patterns with the 'giving' verbs in being felicitous with NPs denoting concrete entities (15a), but the other verbs included in the subclass are not (15b):

(15) (a) Walt gave/lent/handed/showed Jesse {the gun/the poison/the money}.

(b) #Walt told/read/taught Jesse {the gun/the poison/the money}.

Although the indirect object referent of *show* is inferred to SEE something (not RECEIVE it), the verb itself implies a physical act involving physical entities, just like the 'giving' verbs, and not a communicative one. It is therefore unsurprising that it makes a poor fit with the verbs in (15b).

However, the argument types linked to the direct object of these verbs do not suffice to define a coherent semantic set either:

(16) (a) Walt #told/read/#taught Jesse a letter.

(b) Walt #told/#read/taught Jesse chemistry.

(c) Walt told/read/taught Jesse a story.

Even in (16c) where all three verbs are non-deviant with the same direct object token, the NP is interpreted differently: *a story* is a message in oral form with *tell*,

[15] Hence Rappaport Hovav & Levin's (2008: 140) suggestion that the sense of *promise* can be 'captured' with *will* + *have* is misleading: 'all will have a good time' is not entailed by *promise a good time to all* as they claim; it paraphrases the content of the promise, but not the meaning of the whole expression. Earlier in their paper, they appeal to Koenig & Davis (2001), who first acknowledge the failure of the 'caused possession' entailment, then propose that what they call a 'sublexical modality' for these verbs may effectively circumscribe the event schema in order to preserve its syntactic validity. Thus *promise* 'entails a transfer of possession in models in which the set of circumstances is restricted to those in which people honor their promises' (Koenig & Davis 2001: 85). This suggests a philosophy of meaning thoroughly at odds with a mentalistic view of semantics (including Rappaport Hovav & Levin's), but since no evidence is offered in support of it, their hypothesis is unfalsifiable.

but it must be in written form for *read*, and its role in relation to the indirect object referent differs for *teach*, since it is not merely perceived but mentally acquired by him. These facts substantiate Jackendoff's (1987) argument that there are many verbs whose semantic argument types cannot be generalised by appealing to uniform semantic roles.

Finally, the mapping hypothesis is undermined by cases where semantic coherence exists, but it fails to entail syntactic coherence. Although there are near-synonyms of alternating ditransitives, they follow DISTINCT syntactic patterns:

(17) (a) Walt showed {the hiding place to Skyler/Skyler the hiding place}.
(b) Walt revealed {the hiding place to Skyler/*Skyler the hiding place}.

(18) (a) Walt promised/*threatened revenge to the gang that robbed him.
(b) Walt *promised/threatened the gang that robbed him with revenge.

(19) (a) Walt told Skyler (of/about) the problem.
(b) Walt informed Skyler *(of/about) the problem.

(20) (a) Walt gave/handed/lent {the gun to Jesse/Jesse (*with) the gun}.
(b) Walt issued/presented/supplied {the gun to Jesse/Jesse *(with) the gun}.

As we see in (20), this phenomenon is also manifested in the case of 'verbs of giving'. Therefore, only those verbs that are ACTUALLY, not potentially, in the 'giving' subclass satisfy the input conditions for the rules in (10), since only they have a 'caused possession' entailment, belong to a semantically coherent set, AND undergo the 'right' alternation. Hence the 'rules' are vacuous.

3.2 *The 'weak' hypothesis*

As already noted, Rappaport Hovav & Levin (2008) (henceforth RH&L) argue, *contra* Pinker, that *give* instantiates only 'caused possession' in both syntactic variants, i.e. they assume the mapping rule (21):

(21) [x CAUSE [Y HAVE Z]] ⇒ [NP V NP_i NP_j] / [NP V NP_j $_{PP}$[to NP_i]]

Note that, even if this rule were not vacuous (applying only to an already-enumerated subset of ditransitives), it would represent a significant weakening of the SDH, since there is no longer any isomorphic mapping to syntactic structure from event structure. This notwithstanding, RH&L's paper is remarkable for its implicit claim that 'all uses' of *give* are captured by the schema, since the verb's individual meaning (its 'root' in their terms) is said to be coextensive with it (RH&L: 134–135). This section critically examines the validity of this claim.

According to RH&L, all of the following therefore involve the same 'possessional' meaning (examples based on theirs):

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(22) (a) Brett gave Leslie an apple.
(b) The court gave the parent visiting rights.
(c) We gave a fresh coat of paint to the front door.
(d) The girl gave a black eye to the kid with the German roots.
(e) The 'Artscape' pieces gave a festive air to Park Square.
(f) You could give a headache to a Tylenol [a brand of painkiller].
(g) Nixon's behaviour gave Mailer an idea for a book.
(h) You want to give a wide berth to political discussion.
(i) Oscar will give any employee the boot.

Note that these examples include two (22h, i) they acknowledge as 'idioms', but none of them are identified as problematic for their argument that all uses of *give* 'involve caused possession'. Presumably in an attempt to claim semantic uniformity for even the most metaphorical expressions, they deny that the sense of physical transfer in (22a) betrays the basic elements of the verb's semantics (it is said to be 'illusory'), because the 'possessum' may be an 'abstract entity', in which case the inference of physical transfer fails, as in (22b).

Given that RH&L are defending the SDH ('a verb's own meaning plays a key role in its argument realization options'), what are the constraints that they assume? Although their paper nowhere states these explicitly (they appear to assume no constraints at all on either subject or direct object position), their argument clearly hinges on the properties of the indirect object: if *give* is a 'caused possession' verb, the variable Y in (21) must bear the role of Possessor (and not Location, which would imply MOVEMENT of Z to Y and therefore 'caused motion'). Since a Possessor is by definition an animate, and the syntactic alternation no longer correlates to a difference in meaning, Green's (1974) 'animacy constraint' on the indirect object in BOTH syntactic structures follows.

However, it is not the case that the indirect object is restricted to the expression of animates: (23a–h) are 'echo' responses to examples (22a–h):

(23) (a) {*What/Who} did Brett give an apple to?
(b) {*What/Who} did the court give visiting rights to?
(c) {What/*Who} did you give a fresh coat of paint to?
(d) {*What/Who} did the girl give a black eye to?
(e) {What/*Who} did the five 'Artscape' pieces give a festive air to?
(f) {What/*Who} could I give a headache to?
(g) {*What/Who} did Nixon's behaviour give an idea for a book to?
(h) {What/*Who} do I want to give a wide berth to?
(i) {*What/Who} will Oscar give the boot to?

The test shows clearly that the indirect object referents in (22c, e, f, h) are not animate, and are therefore not Possessors. Consequently, RH&L's statement that

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the indirect object of the oblique is constrained by the fact that *to* 'only takes animate complements and not inanimate complements that designate places' (RH&L: 138) is evidently false.[16] This claim is more clearly contradicted by examples not in their data, not just in respect of the oblique:

(24) (a) Ken Livingstone gave **London** the Congestion Charge.

(b) The Dutch gave the name 'New Amsterdam' to **the city now called New York**.

(c) Did the drug trade give **Albuquerque** a bad reputation?

Contrary to the claim RH&L cite from the literature, the indirect object NPs in bold are NOT in these cases metonyms for animate referents. They are places: in (24a) *London* does not mean '(a particular set of) the people of or in London'; rather, it refers to the city as an (abstract) whole.[17]

The only independent support given for their assertion that the expressions cited above as (22c–e) 'involve caused possession' is that the relation between the indirect and direct objects 'can be described using the verb *have*' (RH&L: 139) (their examples (20a–c)):

(25) (a) The front door has a fresh coat of paint.

(b) The kid with the German roots has a black eye.

(c) Park Square has a festive air.

This argument turns on the question-begging assumption that *have* uniformly lexicalises a 'subevent' of the schema in (21), i.e. that it always means 'possess'. But it does not. Whereas *John has a house* means either that 'John owns' or 'has use of' a house ('possesses', in their sense), neither *John has a brother* nor *John has a bath every day* mean that he 'owns' or 'has use of' a sibling or an act of bathing, and the same is true of all the subjects in (25). Moreover, these subjects can be construed (metaphorically or not) as LOCATIONS rather than Possessors, and locational PPs can therefore be adjoined, as seen in (26):

[16] Their paper is replete with confusing and contradictory claims about the indirect object, which is curious given that the nature of the constraint is crucial to their argument. Their Section 4 states that 'with all verbs' it is 'semantically restricted' to the expression of a 'recipient' (said to be 'generally an animate entity capable of possession'), yet on page 156 they note that in their earlier examples (see 25c, e, f) the indirect objects are indeed inanimate. Their footnote 10 cites another example of an inanimate indirect object (*give **the page** a number*); they comment that 'certain instances of inalienable possession' can license inanimates, though without elucidation.

[17] An anonymous *JL* referee comments that *London* may nonetheless have an 'institutional reading' that *Park Square* in (22e) cannot. Names of places and organisations can be metonymically animate, but this is a property independent of syntactic context (***The school** called and gave Walt the sack*; *As an ex-employee of **the library**, John decided to donate all his books to **them***). It remains the case that *Ken Livingstone gave who the Congestion Charge?* is a markedly infelicitous echo response to (24a).

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(26) (a) The front door has a fresh coat of paint **on it**.
(b) The kid with the German roots has a black eye **on him**.
(c) Park Square has a festive air **around/over it**.

This is not possible, however, for the other instances of *have* just mentioned (including the possessional (27a)), even though all three can also be related to *give*-sentences:

(27) (a) John has a house (#**on him**) ↔ Mary gave John a house.
(b) John has a brother (#**on him**) ↔ John's parents gave him a brother.
(c) John has a bath (#**around/over him**) every day ↔ John's mother gives him a bath every day.

These uses of *have* are therefore semantically non-uniform, and do not support the claim that a 'caused possession' event underlies (22c–e).[18]

It is reasonable to conclude, then, that the expressions in (22b–i) only have various METAPHORICAL senses of 'caused possession', *contra* RH&L. But this is not an option for their 'single meaning' version of the SDH, which entails that the verb imposes UNIFORM semantic constraints on its argument tokens (see Section 2.2 above). RH&L appear to try to pre-empt this difficulty by stating at the outset of their paper that the notion 'possession' should be 'construed broadly' – broadly enough, apparently, to include the idioms (expressions they define as having 'a non-literal meaning') in (22h, i), but not *give birth*/*rise*/*way to* NP, regarding which they surprisingly comment that the verb 'seems to have been bleached of its possessional meaning' (RH&L: 155).[19] However, if the concept 'possessor' is ITSELF 'metaphorical', then it predicts nothing, because any NP at all could qualify as a 'possessor' and be licensed as an indirect object, and since

[18] It is somewhat suspicious that the 'possessive' relation as represented in (21) so directly reflects the syntactic structure of the dyadic verb *have* in English. Consider by contrast the way the relation is expressed in Russian and Turkish (thanks to Benet Vincent for supplying these examples):

(i) U John-a est' dom. (Russian)
at John-GEN is house

(ii) John'un bir evi var. (Turkish)
John-GEN a house there.is
'John has a house.'

Since the relation of the 'possessor' to the 'possessum' is expressed in a radically different way to English, it is not clear how the putative semantic structure would map to morphosyntactic structure in these languages.

[19] The seemingly random distinction they make points to the difficulties that idioms pose for the SDH. O'Grady's (1998) treatment of idioms assumes the SDH but does not address them: his use of a 'thematic hierarchy' is a (somewhat forced) attempt to account for the structure of idioms without regard to their special meanings. A *JL* referee points out that a conservative application of the SDH would treat them simply as lexicalised exceptions to the mapping rules, therefore 'listed'.

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according to the SDH, semantics is the SOLE source of grammatical constraints, it would follow that there are no constraints on grammatical structure at all.[20]

The *reductio ad absurdum* of this position is that there is no way of distinguishing between 'caused possession' and 'caused motion'. Consider the pairs in (28) and (29):

(28) (a) Skyler gave the door a coat of paint.
(b) Skyler put a coat of a paint on the door.

(29) (a) Skyler gave Walt the blame.
(b) Skyler put the blame on Walt.

According to the SDH, *the door* and *Walt* are Possessors or Recipients when they appear with *give* but Locations when they are arguments of *put*. Yet the paired expressions are clearly synonymous, and have the same entailments ('the door is covered with paint'; 'Walt is made responsible'), so there is no way to distinguish one event schema from the other, and no logical riposte to the counterhypothesis that *give* and all the other ditransitives 'metaphorically' instantiate the 'caused motion' schema.[21] Any meaningful comparison of hypotheses is therefore impossible.

3.3 *Conclusions*

This section has shown that the SDH cannot be maintained as an adequate account of the ditransitive alternation. The 'strong' hypothesis, whereby distinct event schemata, 'caused possession' and 'caused motion', map to corresponding syntactic structures, is disconfirmed by the absence of systematic polysemy among the alternating verbs, the absence of a general 'caused possession' semantics, and the failure of a 'caused possession' semantics to entail the alternation. Even the 'weak' hypothesis, which holds that a single 'caused possession' event maps to 'all uses' of one verb – *give* – fails in the face of metaphorical and idiomatic expressions which violate the constraints that the SDH entails.

4. THE INTERACTION OF VERBAL SEMANTICS AND SYNTACTIC ARGUMENT STRUCTURE: FROM 'PROTOTYPICAL' USE TO IDIOM

This section sets out the alternative hypothesis of lexical entries, concerning the relationship between a verb's lexical meaning, its semantic arguments, and its

[20] RH&L appear to assume the sort of deep 'cognitive metaphor' (operating at the hidden level of conceptual structure) which is invoked by Pinker (1989) at various junctures, and (in support of the same classification of ditransitive verbs) by Gropen et al. (1989: 207), who assert that '[v]erbs of communication . . . fit into the hypothesis under the assumption that they are mentally represented as metaphoric extensions involving the notion of ideas being possessed and transferred'. In truth, this assumption is a kind of *deus ex machina*, which can be summoned as required to save the SDH from falsification.

[21] In fact, Goldberg (1995: 89–95) makes just this proposal for the ditransitive oblique, claimed to be a 'metaphorical extension' of the 'caused motion construction'.

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syntactic arguments. The crucial principle is that syntactic arguments are represented discretely from semantic arguments, which are types that do not constrain the realisation of argument tokens, although it will be shown that the semantics of types versus tokens is critical to (metaphorical) interpretation. The hypothesis stated in Section 4.1 is then applied to three semantically and syntactically related verbs: 'caused possession' *give*, polysemous *send*, and the non-alternating 'location' verb *put*. It is shown that a correct characterisation of these verbs' semantic and syntactic argument types accounts for the 'argument realisation' phenomena of these verbs in both prototypical and non-prototypical (metaphorical and idiomatic) use. Section 4.2 addresses more directly the principles of verbal metaphor generation, based on Sullivan (2013), and shows how these support the hypothesis. In the light of these principles, Section 4.3 addresses the question of what a verbal 'idiom' is.

4.1 *A non-determinist hypothesis of lexical entries*

The alternative hypothesis concerning the properties of lexical entries is stated informally as follows:

(30) (a) The lexical entry of a verb contains all stipulated phonological forms (minimally, that of the verb itself), the meaning of the verb, all its semantic arguments, and all its syntactic arguments (morphosyntactic categories).

(b) Semantic arguments are types determined by the meaning of the verb and are linked to, but do not determine the form of, syntactic arguments.

(c) Syntactic arguments are morphosyntactic types and are the only part of the lexical entry licensing argument tokens.

Nothing in (30) precludes a lexical entry from having a single set of semantic arguments but more than one set of syntactic arguments. The hypothesis is neutral as to whether the verb's meaning itself is 'structured' in the sense of e.g. Jackendoff (1990), but semantic arguments are the only part of meaning 'visible' to argument structure.

Some evidence for semantic arguments as types, existing independently of syntactic realisation, is supplied by the following:

(31) (a) It was surprising that **they** died so suddenly.

(b) (For **them**) to shine so much was surprising.

(32) (a) It was surprising that **they** gave **them** that.

(b) (For **them**) to owe that to **them** was surprising.

Devoid of context, the pronominal subject arguments of *die* and *shine* in (31) are likely to be construed as animate and inanimate respectively, since it is animates that die and inanimates that shine. Similarly, in (32), the subject and indirect object

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arguments of *give* and *owe* have their 'default' animate interpretation. However, as we have seen, argument tokens need not conform to these properties:

(33) (a) It was surprising that the computers died so suddenly.
(b) For the girls to shine so much at school was surprising.

(34) (a) It was surprising that steel tubes gave the designs such a 'retro' look.
(b) For the experiments to owe their success to atmospheric conditions was surprising.

Nonetheless, as was shown in the echo-question test (23), the non-prototypical tokens RETAIN their inherent semantic properties:

(35) (a) It was surprising that **what** died so suddenly?
(b) For **who** to shine so much at school was surprising?

(36) (a) It was surprising that **what** gave **what** a 'retro' look?
(b) For **what** to owe their success to **what** was surprising?

In other words, the semantic properties of the argument types and the argument tokens are DISJOINT, a phenomenon which will be returned to below.

In this light, we now look at *give* in more detail. The *Oxford English Dictionary* gives the 'general sense' of the verb in modern English as 'to make another the recipient of (something that is in the possession, or at the disposal, of the subject)'.[22] The definition intuitively characterises a physical act of transference involving three participants, which can again intuitively be distinguished: (i) an agentive, animate (prototypically human) agent; (ii) an animate recipient; (iii) an inanimate physical entity capable of being passed from (i) to (ii).[23] These semantic properties characterise and individuate the verb's semantic arguments.

Note that it is not sufficient for the direct object argument to be inanimate; it must also possess certain concrete properties (e.g. solidity and mobility) to be physically transferable. When an argument token lacks one or more of these properties, there is a concomitant effect on the construal of the act of transfer itself. Compare the following:

[22] The *OED* entry goes on to say that the cognate verb in Old English had the more restricted sense 'of freely and gratuitously conferring on a person the ownership of a thing, as an act of bounty' (as in the nominal *gift*). Of modern English, the *OED* observes that 'both the wider and the narrower senses are still current'.

[23] 'Prototypical' usage does not necessarily align completely with the property of a semantic argument. To take another example, the object of *kiss* is prototypically human, but one can kiss all kinds of things (*the cat*, *a crucifix*, *the tarmac*) without the act of kissing becoming metaphorical. Similarly, it is not clear that the subject and indirect object arguments of *give* are typed specifically as 'human', because although typically they are realised by NPs with human reference, a sentence like *The cat gave the kitten a piece of fish* still describes a physical act of transference and not a metaphorical one such as *The cat gave the kitten a lick* or *The noise gave the kitten a fright*.

(37) (a) Gus gave Walt **a new lab**.
(b) Gus gave Walt **a punch**.
(c) Gus gave Walt **an important task**.
(d) Gus gave Walt **an hour to get ready**.
(e) Gus gave Walt **three reasons to betray Jesse**.

While a laboratory is inanimate, it has properties (size, mass, immobility) which make the inference of physical transfer fail; only the inference of transfer of ownership or use remains. The NPs *a punch* and *an important task* have (possible) physical manifestations, but lack concrete properties; the nouns *hour* and *reason* denote entirely abstract entities. This mismatch between the properties of the semantic argument and those of the tokens results in the 'transfer' meaning denoted by the verb being only metaphorically interpretable; in all apart from (37a), even the notion of 'possession' becomes abstract.

As already borne out by the data in Section 3.2, the indirect object can be realised by non-animate tokens (see also (38b–d) below), but the same is true of the subject, where inanimate tokens 'conflict' with the agentive, animate argument type associated with this position:

(38) (a) **The helmet** gave Athelstan an idea.[24]
(b) It's the **tomatoes** that give this dish its sharp flavour.
(c) **Honesty** gives moral strength to a person's character.
(d) **The fact that we were strangers** gave our information a strange importance.

Again, the subject NPs retain their inherently inanimate reference (as a *what?* test will confirm) and therefore are not inherently 'agentive'. But their syntactic position, where an animate argument type is interpreted, triggers an interpretation whereby they cause 'transfer' of some entity to a metaphorical recipient.

What of the relation between the verb's semantic arguments and its syntactic argument structure? As already established, *give* has two syntactic structures, but only one meaning, and therefore only one set of semantic arguments, so the same arguments must be mapped to both structures. Furthermore, since the verb has no sense of 'caused motion', the preposition *to* of the oblique cannot denote a Path, and as the oblique is synonymous with the double object, it follows that *to* is meaningless, and must be simply a stipulated form in the lexical entry.

The role of syntactic arguments in determining constraints, plus that of semantic arguments in the triggering of metaphor, are supported by a brief initial consideration of *give*-idioms, of which a small sample is provided in (39):

[24] Example from Sullivan (2013: 100).

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(39) (a) Skyler gave Walt **the elbow**.
(b) Jesse gave the formula **a go**.
(c) Hank gives **his all** to police work.
(d) Walt finally gave **the green light** to Skyler's plan.
(e) Jesse wanted to give meth-making **a rest**.
(f) Skyler gave **birth** to a girl.

Four things are striking: first, that *give*-idioms, in principle at least, occur in both syntactic variants. Second, as noted by Hudson (1992: 262) and Bruening (2010: 536), the 'fixed' part of *give*-idioms (in boldface) is always the direct object, never the indirect object alone. Third, as can be seen in (39b–e), the 'open' indirect object position can be occupied by an inanimate. Fourth, the fixed direct object, though inanimate in its literal reference, does not otherwise conform to the physical properties of the argument type, so we do not find idioms like *give* NP *a book*. Idioms therefore share properties with metaphorical uses in that (i) they obey the verb's syntactic constraints; (ii) they do not observe putative semantic constraints; (iii) at least one argument token (the direct object in the case of idioms) must be semantically disjoint with the verb's corresponding argument types.[25]

We turn now to *send*. Given the premise that this verb is polysemous, it has two sets of semantic argument types. One set, entailed from the 'caused possession' sense, will be assumed to be identical to that of *give* above, and these arguments will be mapped to the same alternation, repeated below:

(40) (a) [NP V NP_i NP_j]
(b) [NP V NP_j [P NP_i]]

It is then predicted that *send* in this sense should behave in principle just like *give* in allowing subjects and indirect objects in either variant to be realised by inanimates as well as animates, and direct objects to be non-concrete:

(41) (a) **Walt's act of violence** sent {his enemies/**Albuquerque/the world**} a chilling message.
(b) **Walt's act of violence** sent a chilling message to/*towards {his enemies/**Albuquerque/the world**}.

As (41b) shows, the hypothesis that the argument type linked to the indirect object is a Recipient is supported by the fact that only *to*, and not a true Path preposition, is licensed. It is also notable that, as with *give*, there are no idioms with a fixed indirect object and open direct object. On the other hand, the ability of an inanimate indirect object to have a 'metaphorical recipient' interpretation seems considerably more limited than *give*:

[25] At least one violation of the syntactic constraints is *give* NP *to understand* 'allow NP to infer'. But given the sheer number of *give*-idioms, their syntactic regularity remains overwhelming.

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(42) (a) Walt gave/#sent **the house** a complete makeover.
(b) Walt gave/#sent **the idea he might die** subtle encouragement.
(c) Fear gave/#sent **Walt's efforts to control Jesse** intense urgency.

However, this restriction can be attributed to the fact that *send*, even in the above sense, has a more specific lexical meaning than *give* (something like 'transfer by causing to go') and is therefore less readily available to metaphorical usage *per se*.[26]

In its 'caused motion' sense, *send* has a Path argument instead of a Recipient. This argument maps to a PP, which consists of a preposition specifying the Path, and an NP complement specifying its endpoint. Unlike *give*, there is no lexical restriction on the preposition:

(43) Gus sent the drugs {to the warehouse/over the border/towards Mexico}.

In fact, the head of the PP is clearly semantic, so in this context *to* is 'allative', i.e. it has its meaning of 'up to an endpoint', and is not a meaningless grammatical marker. The preposition is therefore lexical, and itself selects its NP complement (its 'subject' being the direct object of the verb). Therefore, the internal properties of the PP are not relevant to the syntactic argument structure of the verb, which is as follows:

(44) [NP V NP PP][27]

Further evidence that the Path argument is mapped to the whole PP (and not to the NP inside it) is provided by a comparison between the 'caused possession' sense of (45a) and the 'caused motion' one of (46a):

(45) (a) Gus sent {the Mexicans the drugs/the drugs to the Mexicans}.
(b) Who did Gus send the drugs to?
(46) (a) Gus sent the drugs over to the Mexicans.
(b) Where did Gus send the drugs?

[26] Metaphorical usage seems relatively restricted even when the indirect object is animate (*send* ***someone*** *confirmation/a sign/one's best wishes*), and there are markedly fewer idioms (*send* NP *word* is a candidate for the latter), all of which are metaphorical acts of communication. If the DIRECT object is realised by an animate (*Gus sent the Mexicans his most trusted employee*), it is metaphorically 'received' by the indirect object, given the assumptions concerning the semantic argument types above.

[27] The verb *show* also has a 'motion' sense, in which case it patterns with *send* in subcategorising for a lexically unspecified PP (*show/send somebody* {*into the room/out of the building*}). In this case it means 'accompany along a path', not 'demonstrate': *John showed Mary out of the building* (*by walking her down the corridor/#by drawing her a map*). This 'caused motion' sense is appealed to by Larson (2017: 412) to suggest that *show somebody the door* is an idiomatic caused motion construction with an 'elided' preposition. However, it is obscure why the idiom would have the double object form if it is based on a verb with a Path argument, something impossible with a caused motion verb otherwise: *send/take Mary* *(*towards*) *the exit*. The idiom must therefore be based on the 'cause to see' sense and the double object form.

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In (45a), *the Mexicans* realises a Recipient argument and is animate, as shown by the use of *who?* in (45b). But in (46), where *to* is a (modifiable) Path preposition, the PP is questioned with *where*, and so is a Path argument and interpreted as one, even though the answer is 'to the Mexicans' (meaning that *the Mexicans* is a metaphorical 'endpoint').

The polysemy view of *send* solves an apparent 'idiom anomaly' illustrated by the following expressions, originally cited in Larson (1988: 340) as evidence that (some) 'goal' indirect objects of ditransitives can be idiomatic:

(47) (a) Lasorda sent his starting pitcher to **the showers**.
(b) Mary took Felix to **the cleaners.**
(c) Felix threw Oscar to **the wolves**.

However, as Larson (2017: 423) concludes, these idioms are in fact not true ditransitives, but based on 'caused motion' verbs. If these verbs have Path arguments interpreted on their PP, then the bolded NPs are metaphorical endpoints like *the Mexicans* in (46a) (in the idioms they are actually metaphorical endpoints of METAPHORICAL Paths).[28]

The third verb to be considered is *put*, which superficially seems similar to 'caused motion' *send*, subcategorising for a PP, but permitting a 'free' choice of preposition:

(48) Walt put the gun inside/on/under/over/beside the bed.

Although Jackendoff (1987: 391) remarks that the verb has a 'curious selectional restriction', disallowing a preposition of source (*from*), direction (*to*, *towards*) or route (*through*), this is not an absolute restriction, as the following metaphorical/idiomatic expressions show:

(49) (a) put NP **from** one's mind, put NP **out of** pocket
(b) put NP **to** bed, put NP **to** the test, put money **towards** NP
(c) put NP **through** a window, put NP **through** his/her/its/their paces, put NP **through** an ordeal

Thus subcategorisation for a lexically unspecified PP must be correct; the apparent 'selectional restriction' says something about the argument type mapped to this PP.

Comparison with *send* and *put* in a prototypical context shows that their Path argument is not of the same type:

(50) (a) send/#put the drugs {towards the mountains/(halfway) to Mexico}
(b) put/#send the drugs {into the drawer/at the side of the desk}
(c) put a student {in jail, in a different seminar group}
(d) send a student {to jail, to a different seminar group}

[28] Some other 'caused motion' idioms of *send* are *send* NP {*to Coventry*, *into a tailspin*, *off* NP*'s rocker*, *out of* NP*'s mind*}. The variety of possible prepositions supports (44) as the correct argument structure.

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This distribution of PPs suggests that this argument of *put* describes a trajectory, but also a spatial relationship between the complement of the preposition and the direct object of the verb (concepts that *to* and *towards* cannot denote), so the verb does not really lexicalise 'caused motion', but something more like 'caused location'. In contrast, as we have seen, the Path of *send* includes an endpoint (concepts denoted by *to* and *towards*).

In fact, the meaning of *put* is arguably at least as close to *give* as to *send*. As expected, metaphorical and idiomatic usage reveals the lack of semantic constraints on argument realisation, but *put* manifests both metaphorical Themes (like *give*), and metaphorical Paths (like *send*) (non-prototypical forms in bold):

(51) put something into **a category**, put {**a curse** on, **the wind** up, **the fear of God** in} **somebody,** put **somebody**/something at **risk**, put **somebody** {at **ease**, in **the picture**, in **a mood**, under **observation**}

Nonetheless all these examples meticulously respect the syntactic argument structure represented in (44).

If there are no semantic constraints on argument realisation, there is a further prediction. Although semantically 'mismatching' argument tokens might lead to coherent metaphorical interpretations, they need not. Thus expressions with 'fictional' senses are licensed by the grammar (52a), as well as surreal (52b) and nonsensical ones (52c):

(52) (a) The acacia tree gave the honey badger a tail-brush.
(b) Dali's lips put the set of all prime numbers inside the Horsehead Nebula.
(c) Sincerity may send forgetfulness towards bravery.[29]

If argument tokens are subject only to syntactic constraints, then expressions such as those above are entirely non-deviant as far as the grammar is concerned.

In conclusion, the hypothesis of (30) correctly predicts that the only grammatical constraint on argument tokens of these verbs is provided by their syntactic argument structure, with a verb's semantic argument types only determining their interpretation. Hence metaphorical and idiomatic expressions are licensed in principle. However, this does not in itself account for how metaphorical expressions 'work', or how they are related to 'idiomatic' expressions. The next two sections turn to these questions.

[29] As McCawley (1971: 219) noted, many 'violations' of semantic constraints 'are quite normal in reports of dreams, reports of other people's beliefs, and science-fiction stories'.

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4.2 *The relation between verbal semantics and metaphor*

Lakoff (1987) observes that metaphor is universal and pervasive in natural languages, but his contention that metaphor moulds the grammatical system itself is unpersuasive. Sullivan's (2013) study of metaphoric language emphasises that the reverse is true: grammatical structures have an essential role in CONSTRAINING metaphorical interpretations. Metaphors are cognitive phenomena that involve a process of mapping a 'source' concept (usually of a concrete kind) to a 'target' concept (usually abstract). Crucial to the understanding of verbal metaphors is the fact that, in Sullivan's terms, verbs are conceptually 'dependent' elements (in the sense of usually requiring other 'autonomous' elements – arguments, in fact – for their interpretation): verbs therefore make good 'source domains' for metaphors involving 'target domain' arguments. For this to be possible, metaphors must belong to the conceptual system, which is independent of the grammatical system (one of the key principles of 'representational modularity' argued for in Jackendoff 1997). In this light, we can now understand that the empirical problems which metaphors pose for the SDH derive directly from the LACK of any syntactic argument structure representation, which makes it impossible for 'source' and 'target' domains to be distinguished.

The principle that source and target domains must be conceptually distinct allows us to be more precise about the role of semantic arguments in terms of the present hypothesis. It is the meaning of a verb and its semantic argument TYPES that provide the source of a metaphorical interpretation, and argument TOKENS that provide the target.[30] A metaphorical interpretation can then be triggered if at least one argument token is semantically disjoint with the corresponding semantic argument type. Compare again:

(53) (a) Walt gave Jesse a gun.
(b) Walt gave Jesse a punch.

The lexical meaning of *give* and its semantic argument types provide the source: the basic sense of transfer by an animate Agent of a concrete Theme to an animate Recipient. In (53a) the semantic properties of every token are 'subsumed' by the properties of the corresponding type, so the 'target' NPs are understood as instantiations of the source types – hence the 'prototypical' sense. In (53b), the metaphorical interpretation – 'Walt punched Jesse' – is triggered by the target *a punch*, whose semantic properties are now disjoint with the properties of the

[30] Sullivan's formulation of the salient grammatical properties rests on Goldberg (1995), which makes it difficult to identify 'source domains' distinct from 'target domains' with any clarity, one reason being the lack of any formal representation of syntactic structure in that theory (the 'syntactic' level of Goldberg's 'ditransitive construction' only mentions grammatical functions, such as 'OBJ1'; yet grammatical functions represent notional RELATIONS BETWEEN forms, not the forms themselves). Sullivan does not discuss the oblique of (2b), but since for Goldberg this is itself a 'metaphorical extension' of the 'caused motion construction', it is obscure how the oblique could also function as a source domain, as metaphorical usage (*London Underground gave each station to a different architect*) shows it must.

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source type linked to the direct object position.[31] Combined with the (source) sense of 'transfer' from the verb and the source types of the other two arguments, this generates the metaphor (that punching somebody is like transferring an object to them).

4.3 *The relation between verbal metaphor and idioms*

The notion of an 'idiom', as addressed in the literature, encompasses a rather miscellaneous collection of 'multi-word' expressions, ranging from highly irregular (including grammatically fossilised) forms at one extreme (see van Gestel 1995 for Dutch data) to 'conventionalised' phrases such as *center divider* (Nunberg, Sag & Wasow 1994) at the other. Another property that has been held to be criterial, particularly for verbal idioms, is semantic opacity or 'non-compositionality', as evidenced by *kick the bucket* and *shoot the breeze*, although it has been observed that it does not, in fact, appear to be very typical of expressions which are intuitively idiomatic.[32] Having established that metaphorical usage fully respects the syntactic argument structure of the verb, and that the only difference between prototypical and metaphorical usage lies in the properties of the argument tokens themselves, it is possible that there is no basis for positing a separate category of 'idioms' for any of the expressions studied here. Indeed, Larson (2017) argues that there are NO true ditransitive idioms at all. Consider the following three sets of expressions:

(54) (a) give NP a cold, a headache, the mumps . . .
(b) give NP a kiss, a push, a smile, a wave . . .
(c) give NP the creeps, flak, a hand, the boot, one's all . . .

Larson first draws attention to expressions of type (54a), whose direct objects denote communicable illnesses: these seem 'completely productive', and the direct objects all have their usual dictionary meanings. The same can be said for the 'denominal' direct objects in (54b): as the meaning of the direct object is

[31] Sullivan claims that, in metaphorical ditransitives, minimally the direct object must be the target (as in this example). Although this seems usually to be the case, it is not an absolute constraint. Compare *American industrial production gave us ready-sliced bread*; *John gave us ready-sliced bread*. The direct object token conforms to the properties of the argument type in both sentences, yet it is clearly *American industrial production* in the former which provides the target for the metaphor.

[32] Everaert (2010) points out that semantic non-compositionality entails nothing about the proper theoretical description of an idiom: given an appropriate theory and notation, even *kick the bucket* can be given a compositional analysis. Compositionality has been related in the literature to the internal modifiability of idiom constituents, and to 'syntactic flexibility' (ability to undergo passivisation, extraction, etc.), which has motivated analyses where there is a representational difference between idioms of different subtypes (Jackendoff 1997, Horn 2003). Discussion lies beyond the scope of this paper, but syntactic inflexibility does not entail a special structural representation. Postal (2004: 233–285) details numerous cases of verbs in non-idiomatic use that fail to passivise, though not for any lack of the 'right' structural properties. For that reason, syntactic mutability as a diagnostic for idiomaticity is ignored here.

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transparent, the meaning of its combination with the verb can be derived. Larson goes on to argue that expressions of the type in (54c) (where the regularity of the direct objects is less convincing) are no different: for example, if *the creeps* means 'a feeling of apprehension or horror', then the expression *The Count gave me the creeps* can be generated without special stipulation.

Larson's analysis is plausible in principle, but there are a number of problems with it. If the expressions of the (54c) type are indeed compositional, it is necessary that their direct objects combine in that form, since they are generally invariant:

(55)	(a)	give NP the creeps/*a creep/*creeps	'make NP feel uneasy'
	(b)	give NP a hand/*the hand/*hands	'help NP'
	(c)	give NP the boot/*the boots/*a boot/*boots	'rudely dismiss NP'

Therefore there must be in the lexicon an idiomatic NP 'the creeps' meaning 'feeling of unease', an NP *a hand* meaning 'help', an NP 'the boot' meaning 'rude dismissal', and so on, in order for the expressions to be computed as Larson claims. Furthermore, these NPs and their relationship to the verb are no different from those in generally uncontested idioms such as *keep **tabs** on* 'monitor closely', *spill **the beans*** 'reveal a secret' or *pull **strings*** 'exert influence', in two respects. First, their direct objects have the specially idiomatic property that they supply metaphorical SOURCES, not targets, together with the verb (as noted by Sullivan 2013: 96). For example, both *spill* and *the beans* evoke 'reveal' and 'a secret'. Equally, *give* evokes 'transfer' and *a hand* evokes 'help'. Second, Larson's contention that the apparent *give*-idioms are merely 'collocations' (a collocation being a 'conventionalized co-occurrence') is problematic, because for him, 'conventionalized' appears to mean only that words are 'used together frequently' (Larson 2017: 399), like *rancid butter* and *dead serious*. But while the collocation of *rancid* and *butter* can be PREDICTED from the meaning of *rancid*, the same cannot be said of *give* and the direct objects in (54a–c). The meanings of *lend* NP *a cold*, *put a kiss on* NP, and *throw* NP *the boot* are compositional/computable, but they are not collocations because they are not conventionally associated with the meanings that the expressions in (54) are. Rather, the direct objects of (54) collocate with *give* in the sense of being 'conventionally associated in the lexicon'.[33]

A further problem is that Larson does not succeed in showing that ALL ditransitive idioms are syntactically productive. Since *give* syntactically alternates in both prototypical and metaphorical use, we would expect all candidate idioms to do the same. But this is by no means clearly the case:

(56)	(a)	?Walt gave {a cold/the mumps/a smile/a wink} to his baby daughter.
	(b)	??Walt gave {a kiss/a tickle/a wash} to his baby daughter.

[33] The productivity of the expressions in (54a, b) could be accounted for if only one or two exemplars are actually listed. On that basis, further expressions could be generated freely.

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(c) ??Jesse gave {a go to the new formula/a rest to meth-making}.
(d) ??The discovery gave Walt's story the lie.
(e) *Skyler gave the child birth.
(f) *Walt gave his worries voice.
(g) *Walt gave fortune hostages.[34]

For these reasons, we must conclude that ditransitive idioms are genuine, and fit into the hypothesis (30) as 'partly lexicalised' metaphors, in the sense that (i) the idiomatic constituent is represented phonologically; (ii) the metaphorical meaning, like that of *kick the bucket*, is therefore stored with the whole expression. In Section 5 it will be shown how a theoretical description can account for both 'compositionality' (of metaphorical and prototypical uses) and (partial) 'non-compositionality' (of idioms).[35]

4.4 *Conclusions*

This section has confirmed that the three verbs analysed do not determine semantic constraints on argument realisation. Constraints on argument tokens are syntactic, in respect of which the inherent semantic properties of argument tokens are irrelevant. One apparent constraint – the 'selection' of a lexical preposition with 'caused motion' *send* and *put* – is in fact a side-effect of the semantic argument type linked to the PP in the syntactic representation. Metaphorical interpretations occur when the semantics of one or more argument tokens (the 'target') are disjoint with the corresponding semantic argument types

[34] All judgements are mine. A Google search, as well as scattered judgements in the literature, unsurprisingly suggest variation in acceptability, although context/pragmatic factors may of course play a part. Larson (2017) does not really address syntactic productivity as a diagnostic, but remarks (on page 413) that genuinely alternating ditransitive idioms are a problem for (TGG) analyses that reject a derivational relationship between the double object and oblique structures. If there are 'no' ditransitive idioms as he claims, then the empirical problem simply goes away.

Larson claims that the expressions in (56e, f) (others are *give rein/rise/way to* NP) are not synchronically ditransitive at all, but 'compound verbs' inserted directly under a V node, on the basis that *give* is 'virtually' inseparable from the nominal element. But as implied by the hedge, it is not absolutely inseparable and the nominal can be modified (*give* ***unexpected*** *birth to*, ***excessive*** *rein to*, ***sudden*** *rise to*, ***timid*** *voice to*, ***partial*** *way to*), so these elements must still have syntactic representation as NPs. It is a safe conclusion that they are both syntactic forms AND idioms.

[35] An unanswered yet intriguing question remains as to why there are no ditransitive idioms with lexicalised indirect objects only. It is suggestive that the concept 'human' (not merely 'animate' as claimed in Nunberg et al. 1994) seems to provide a poor metaphorical source in general, and that indirect object types, belonging to the source domain, are animate. However, since inanimate NPs can be indirect objects, it is not clear why these could not themselves provide a source domain in idioms, as inanimate NPs usually do (*kiss the dust*, *obey a call of nature*). It is possible for the indirect object position to be filled by an NP that is itself idiomatic (*I decided to give shanks's pony* ['walking'] *a try*), but the whole expression is not an idiom. In the very few ditransitive idioms where both NPs are lexicalised – Nunberg et al. (1994) cite *give the devil his due* and *give hostages to fortune* – only *the devil* is an indirect object that is (arguably) a source (even so, it can be substituted by the neutral *a person*).

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determined by the verb (both part of the 'source'). Consideration of idioms as partly lexicalised metaphors confirms this view: both their syntactic structure and metaphorical nature have their roots in the syntactic and semantic properties of the head verb.

5. A UNIFORM REPRESENTATION FOR LEXICAL ENTRIES

This section presents a theoretical description of the results above. After setting out some general theoretical assumptions in Section 5.1, the 'Lexical Argument Construction' is introduced (Section 5.2), an argument-licensing structure which represents the required properties of a verb including grammatical constraints. Lexical Argument Constructions are then illustrated for the three verbs analysed in Section 4, as well as for a *give*-idiom, to show how the description can incorporate the representation of idioms using the same principles.

5.1 *Theoretical background and assumptions*

Although no particular theory of syntax will be adopted here, a constraint-based, Construction Grammar (CxG)-type framework is assumed. CxG takes the lexicon of the grammar to consist of CONSTRUCTIONS: in the most general terms, constructions are associations of 'form' with 'function'. The main theoretical value of constructions for the present study is that they are NON-DERIVED and NON-UNIFORM: they may be as small as morphemes, or be syntactic units (possibly semi- or fully-lexicalised). Hence CxG is readily amenable to the representation of idioms and other idiosyncratic expressions (see e.g. Kay & Fillmore 1999).[36] But if the argument properties (syntactic and semantic) of a lexical head are taken to be non-derived, then a lexical head and its dependants are a candidate construction also.

This notion of 'construction' is combined with the compatible principles of lexical structure proposed in Jackendoff (1997, 2002). Jackendoff's model for lexical items conforms to the properties of his 'parallel architecture': a tripartite linguistic system composed of strictly autonomous generative subsystems (phonology, semantics, syntax) linked by 'interface rules'. On his view, a lexical item is a form of INTERFACE CONSTRAINT, since in the typical case it registers information from all three systems. As Jackendoff (2002: Section 6.5) argues, the properties of idioms require these too to be stored (as phrasal 'lexical items'), but in his model these properties can easily be handled by the interface rules. In the present proposal, this form of idiom representation is generalised to an argument-taking lexical head itself, so that the head appears in a syntactic configuration with its argument types. The major advantage is that the structural principles of a

[36] The phrasal listing of idioms is argued for by Di Sciullo & Williams (1987) and van Gestel (1995), but 'phrasal insertion' is clearly disfavoured in 'Minimalist' (post-Chomsky 1995) work. Larson (2017: 402) admits the theoretical possibility; even so, it seems that lexically 'discontinuous' idiomatic phrases would be ruled out in principle.

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verbal idiom are then identical to those of its (non-idiomatic) head verb, the major difference being in what is represented.

5.2 *The Lexical Argument Construction*

A Lexical Argument Construction (henceforth LAC) is a subtype of construction that represents the phonological, semantic, and syntactic properties of a lexeme (e.g. a lexical verb). It takes the form of an attribute-value matrix, where the attributes are phonology (PHON), semantics (SEM), and syntax (SYN), and the values are the specified corresponding properties of the LAC. The PHON value is that of the verb and any other stipulated lexemes; the SEM value is the meaning of the LAC (usually just the verb) plus a representation of the semantic arguments (SEM-ARGS) that it entails; the SYN value specifies the category of the head (X) plus those of its syntactic arguments (SYN-ARGS) in phrasal (XP) form (plus any other relevant morphological properties). A SYN-ARG is therefore a purely formal type, e.g. 'NP'.

Following Jackendoff (2002), the three components of an LAC are linked in various ways by 'correspondence rules' in the form of co-indexing. The strict separation of the components means that (i) 'lexicalisation' of any part of an LAC means representation as a PHON value; (ii) the properties of the SYN-ARGS and SEM-ARGS are independent of each other and therefore non-redundantly stateable; (iii) there need be no fully isomorphic mapping between the elements of the three components.

To make things concrete, the LAC for the lexeme *give* is illustrated below:[37]

(57) LAC of *give*

$$\begin{bmatrix} \text{PHON} & \langle give_i\ ,\ to_j \rangle \\ \text{SEM} & \text{`give'} \langle \text{GIVE-AGT}_x, \text{GIVE-RCT}_y, \text{GIVE-THM}_z \rangle \\ \text{SYN} & \big[\text{NP}_x\ \text{V}_i\ \text{NP}_y\ \text{NP}_z\big], \big[\text{NP}_x\ \text{V}_i\ \text{NP}_z\ \big[\text{P}_j\ \text{NP}_y\big]\big] \end{bmatrix}$$

[37] As an LAC is a form of 'lexeme', it embodies only one source of constraints on the realisation of verbs in surface structure, where (for example) the subject argument may be unrealised, as in *ing*-VPs (***Giving the formula to Gus*** *was unwise*) and passive VPs (*Gus wanted* ***the formula given to him***). From (57) it can be seen that the LAC already encodes the 'default' VO syntactic order for English. Müller & Wechsler (2014: 5), as part of their critique of CxG, state that 'phrasal' representations in the lexicon 'would allow' for only one surface exponence, e.g. an active clause. However, the notation they adopt from HPSG makes the same assumption that 'the underlying argument structure of the stem is basically specified as that of an active verb' (their footnote 3). The differences between their 'predicate argument structure' and an LAC are therefore mostly notational, although the advantages of the LAC are: (i) a more rigorous separation of components; (ii) a uniform type of representation that can handle idioms (and other lexicalised phrases) as well. Otherwise, their 'lexical rule' approach to morphological derivation (passive verbs, deverbal adjectives, etc.) seems compatible with the theory of lexical entries set out here.

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It will be seen that the PHON attribute specifies the phonological content of the LAC, which here consists of the lexical verb and the preposition *to* (which must be stipulated). These items are coindexed with heads in the SYN attribute, thereby associating each PHON form with its respective lexical category.

The SEM part of the LAC represents the meaning of *give* ('give') and also identifies its SEM-ARGS arguments, distinguished by the symbols shown.[38] Each is co-indexed with NPs represented in the SYN attribute. There is no coindexing between *to* or P and any part of SEM, ensuring that the preposition is semantically 'void'. However, it will be noticed that whereas the SEM component contains only one representation, the SYN part contains two, and the SEM-ARGS are linked differently. This describes the fact that although there is only one meaning of *give*, its SEM-ARGS arguments can be realised in two syntactic variants (with no effect on meaning).

The importance of the co-indexing of the SEM-ARGS and SYN-ARGS is that it indirectly links semantic sources with semantic targets (argument tokens) via the syntactic licensing of the latter.[39] The SYN value represents a constraint on argument realisation: only tokens which are NPs will be licensed in each position. However, the coindexing ensures that a licensed NP will be interpreted by the corresponding SEM-ARG. For example, any NP token licensed in indirect object position (NP_y) will be linked to the SEM-ARG <GIVE-RCT> and interpreted as an 'instance' of this type, if, as explained in Section 4.2, the semantics of the token is subsumed by the semantics of the type. If one or more tokens is semantically disjoint with the corresponding type(s), then a metaphorical interpretation may be triggered. Other than preventing the licensing of any item which is not of the stipulated category, the SYN representation exercises NO FURTHER CONSTRAINTS on argument realisation. The corollary is that an unbounded set of phonologically filled NPs may unify with the phonologically empty (i.e. unlinked) argument positions in the LAC.

On this basis, we now look at how the LAC represents verbal idioms. The LAC for *give a hand* (*to*) is illustrated below:

(58) LAC of *give a hand* (*to*)

$$\begin{bmatrix} \text{PHON} & \langle give_i\,,\ a\ hand_j\,,\ to_k \rangle \\ \text{SEM} & \text{'help'}\ \langle \text{HELP-AGT}_x,\ \text{HELP-BEN}_y \rangle \\ \text{SYN} & \left[\text{NP}_x\ \text{V}_i\ \text{NP}_y\ \text{NP}_j\right], \left[\text{NP}_x\ \text{V}_i\ \text{NP}_j\ \left[\text{P}_k\ \text{NP}_y\right]\right] \end{bmatrix}$$

[38] The labels should be understood as representing verb-contingent arguments of the required type, and not to imply that they instantiate some generalisation.

[39] Unlike the theta-criterion of GB, nothing forces a SYN-ARG to be linked to a SEM-ARG (deriving the semantically null subjects of e.g. 'weather' verbs in English).

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Comparing (58) with (57), we see that the PHON string *a hand* is stipulated, which is now coindexed with the NP_j (direct object) positions in SYN. This has the effect of 'blocking' the licensing of any other NP in that position. The SEM-ARG linked with that position in the LAC of *give* is now absent, since the meaning of the verb (glossed as 'help') can now be thought of as associated with the whole string *give a hand (to)*. Only two SEM-ARGS remain, which are coindexed with the subject and indirect object NPs unlinked to phonological material. The NPs that they are linked to will license NP tokens in the same way as with *give* above, but of course they will now be interpreted differently, since the SEM-ARGS are now of different types, in line with the special meaning of the idiom.[40] This representation assumes, of course, that this idiom is truly alternating. If the string *give a hand to* cannot be licensed, then the PHON representation of the preposition and the oblique SYN representation are simply omitted.

We now illustrate the LACs for *send*.

(59) LAC of 'caused possession' *send*

$$\begin{bmatrix} \text{PHON} & \langle send_i, to_j \rangle \\ \text{SEM} & \text{'send'}\langle \text{SEND-AGT}_x, \text{SEND-RCT}_y, \text{SEND-THM}_z \rangle \\ \text{SYN} & \left[\text{NP}_x\ \text{V}_i\ \text{NP}_y\ \text{NP}_z\right], \left[\text{NP}_x\ \text{V}_i\ \text{NP}_z\ \left[\text{P}_j\ \text{NP}_y\right]\right] \end{bmatrix}$$

(60) LAC of 'caused motion' *send*

$$\begin{bmatrix} \text{PHON} & \langle send_i \rangle \\ \text{SEM} & \text{'send'}\ \langle \text{SEND-AGT}_x, \text{SEND-THM}_y, \text{SEND-PATH}_z \rangle \\ \text{SYN} & \left[\text{NP}_x\ \text{V}_i\ \text{NP}_y\ \text{PP}_z\right] \end{bmatrix}$$

As two senses are postulated for this verb, accordingly two LACs are represented: (59) illustrates the 'caused possession' sense. In its formal properties it is identical to *give*. However, (60) has a somewhat different representation: (i) there is only one SYN structure; (ii) no internal structure is represented for the PP, and there is no PHON material linked to it; (iii) the PP is coindexed with a different SEM-ARG <SEND-PATH>. This entails, as desired, that any kind of PP token will be licensed. But if its meaning is disjoint with the SEM-ARG <SEND-PATH> to which it is linked, it will be interpreted as either metaphorical or deviant: as with *give*, a prototypical interpretation will only result if the semantics of all argument tokens are subsumed by the verb's SEM-ARGS.

[40] The reader is invited to compare the representation with that of *take to task* in Jackendoff (2002: 169–170).

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Finally, we show the LAC for *put*:

(61) LAC of *put*

$$\begin{bmatrix} \text{PHON} & \langle put_i \rangle \\ \text{SEM} & \text{`put'}\langle \text{PUT-AGT}_x, \text{PUT-THM}_y, \text{PUT-LOC}_z \rangle \\ \text{SYN} & [\text{NP}_x\ \text{V}_i\ \text{NP}_y\ \text{PP}_z] \end{bmatrix}$$

As the reader can verify, this LAC is syntactically identical to that of (60), but it is the properties of the SEM representation that account for the differences identified in Section 4.1: for example, the linking of the PP to the SEM-ARG <PUT-LOC> entails a different type of interpretation on a PP token. Idioms of both verbs would follow the same principles as illustrated above for *give a hand to*, representing a different meaning, different and fewer SEM-ARGS, and more PHON material (e.g. for *put* NP *at risk*, the PP would be coindexed with *at risk*).

6. Discussion: Argument structure and 'predictability'

The analysis of argument structure presented in this paper requires often subtle and non-generalisable semantic properties to be registered in lexical entries, partly in the form of discrete SEM-ARGS, together with explicit and non-derived representation of SYN-ARGS. Since these properties are stipulated for each lexical verb, syntactic information is repeated for each member of a syntactic argument class. An obvious consequence is that lexical entries no longer directly embody any 'principles' of correspondence between semantic and syntactic argument types, *contra* the SDH. It can therefore be objected that intuitively necessary generalisations cannot be stated and that syntactic argument structure patterns are no longer 'predictable' but completely arbitrary.

However, the necessity for argument structure representations to be 'predictable' should be treated with some scepticism. Typically, the notion 'predictable' is conflated with the notion 'algorithmic', which is a necessary assumption of the SDH. But predictability is not algorithmic. Predictability is needed in order to inductively construct hypotheses about argument structure, so is certainly relevant to the child's acquisition of the grammar, but predictions can be disconfirmed by data. It is not relevant to the adult's knowledge. For example, the argument structure of neologisms (*text us your entry*/*your entry to us*) and creative uses (*sneeze the napkin off the table*) cannot be said to be a matter of 'predictability'; rather, such phenomena say something about the nature of a grammar ALREADY ACQUIRED.[41]

[41] The *sneeze* expression, among others, is cited in Goldberg (1995) as *prima facie* evidence for the existence of autonomous constructions. However, as pointed out by Croft (2003) and Boas (2008), her account implies that such expressions should be fully productive, which they are not.

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On the other hand, in a descriptively adequate theory, generalisations about argument structure can be stated elsewhere: in terms of the mental organisation of lexical items, the conceptual 'motivation' of argument structure, and the organisation of concepts more generally (all of which can be used to make generalisations about argument structure patterns across languages). There is no corollary that such generalisations need to be built into the representations of the grammar itself. This is akin to claiming that *donate* has a Latinate 'etymology feature', preventing it from syntactically alternating like Germanic *give* (historical factors explaining how its argument structure 'came to be', to be sure, but not relevant to the speaker's knowledge of that verb).

7. Conclusions

This paper has argued that neither the 'strong' nor 'weak' versions of the SDH successfully account for the ditransitive alternation, the former because the semantic properties of the alternating verbs are too semantically heterogeneous to support it, the latter because the SDH entails that the grammar imposes semantic constraints on argument tokens – but metaphors and idioms clearly violate them. The alternative hypothesis, which requires syntactic argument structure to be explicitly represented in lexical entries, is able to account for non-prototypical use because it maintains discrete representations of semantic and syntactic argument types, and (correctly) attributes the licensing of argument tokens solely to the properties of the latter.

In sum, the analysis (re)confirms the necessity in any syntactic theory of formally representing syntactic argument properties in lexical entries. It also confirms the relevance of lexical semantics to argument structure, though not in the sense of the SDH. Apparent 'selectional restrictions' on PP complements of *send* and *put* can be accounted for with reference to SEMANTIC argument types preserving the strictly autonomous, syntactic nature of argument licensing. Further research into the subtleties of verbal semantics will clearly be crucial to an elucidation of links between meaning and argument structure and the still quite poorly-understood (yet undoubtedly real) principles of idiom formation. But seeking support for the SDH in that domain will probably remain a misdirected effort.

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