

Multiword constructions in the grammar*

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1. Introduction

We take it as given that any description of a language must account for the fact that there are stored (lexical) expressions that consist of more than one word. In many cases, the meaning of such a multiword construction (MWC) cannot be accounted for by a straightforward compositional or 'Fregean' operation that combines the meanings of the words on the basis of how they are arranged in a syntactic structure. A typical example is an idiom like *sell NP down the river*, which means 'betray NP'.

Another class of MWCs, so-called *collocations*, have predictable interpretations, but their particular arrangement of words is idiosyncratic. A typical example is *back and forth* (but not **forth and back*).

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The rich profusion of MWCs in English has been taken to provide evidence against derivational approaches to grammar. Sometimes the proposed alternative is a constructional approach; sometimes it is a statistical account of linguistic structure, lacking rules of grammar altogether.

We will propose something closer to the former alternative. The general characterization of an MWC is that it has some property that is not completely predictable on the basis of the properties of its parts. However, we observe that this characterization itself assumes some notion of grammar – some regular, predictable correspondence between linguistic form and meaning, from which MWCs deviate in one way or another.

Here we survey a range of MWCs and show that in fact they almost exclusively reflect the patterns of grammatical, compositionally interpreted expressions. That is, aside from their extraordinary interpretation or restricted linear ordering, most of them look just like ordinary expressions of the language, with canonical word order and syntactic structure. This massive overlap extends to morphological behavior – for instance the verb *sell* inflects completely normally in the idiom *sell/sells/sold/selling NP down the river*. Similarly, the

intonation of MWCs aligns in perfectly regular fashion with syntactic structure.¹

This overlap between MWCs and regularly derived novel expressions thus suggests that we abandon the traditional view that knowledge of a language consists of a set of syntactic rules that are collectively responsible for generating the novel expressions of a language, plus a lexicon which is simply a repository of the fixed and unpredictable forms. Rather, the grammar has the following architecture:

- MWCs are stored in the (extended) lexicon with their internal syntactic structure.
- The syntactic, morphological and intonational rules of the language apply to stored items as well as to structures constructed online.
- Therefore, the rules of the grammar function in two ways: they are used both to create novel expressions, (as in traditional Mainstream Generative Grammar), and also to license or motivate MWCs stored in the lexicon.

In section 6 we discuss how such rules are to be conceptualized.

¹ See, e.g., Selkirk (1996), Truckenbrodt (1999).

In the intervening sections, we consider some varieties of MWCs and typical examples of each, showing that in almost every case, they conform to canonical syntactic structure. (There is substantial overlap among these varieties, but we keep them distinct here for expository purposes.)

2. Idioms

2.1. Semantic idioms

A typical example of an MWC is an idiom. Some examples are given in (1).

- (1) a. kick the bucket ['die']
b. bridge over troubled water ['calming influence']
c. asleep at the wheel ['incompetent']
d. sell down the river ['betray']
e. in the know ['possessing privileged information']

One salient characteristic of idioms like these is that they are complex forms that involve specific words. In general,

it is not possible to replace any word in (1a-e) with a synonym and retain the idiomatic interpretation.²

- (2) a. kick the pail [≠ 'die']
b. arch over troubled water [≠ 'calming influence']
c. dozing at the wheel, asleep at the steering wheel [≠ 'incompetent']
d. sell down the stream [≠ 'betray']
e. *at the know [≠ 'possessing privileged information']

However, some idioms admit a small variety of variants:
*drive NP nuts /crazy /bananas /insane /*demented/ *meshuga;*
*laugh [or any other intransitive verb] your [or any possessive pronoun] head(s) /ass(es) /butt(s) /*eyes /*legs off.*

A second salient characteristic is that for the most part, idioms are fully representative of the canonical structure of the language, even though they involve specific choices of words

² This is not to say that speakers are unable to manipulate or extend the form of an idiom, either unconsciously or for intended effect, particularly when there is some relationship between the literal meaning of the words and the meaning of the idiomatic expression (Nunberg et al 1998; Gibbs and Nayak 1989; Gibbs et al. 1989; Wulff 2008, 2009; Glucksberg 2001; Geeraert et al., 2017, this issue).

and lack fully compositional interpretations. To be sure, a few idioms, such as (1e) and (3), diverge from the canonical structure, but they are by far the exception rather than the rule.

(3) for the most part
day in day out³
how dare NP VP
be that as it may
suffice it to say that S
over (and over) (again)
time and again
once again
if need be
no kidding
one another
so to speak
by and large

³This construction is deliciously restricted: *year in year out*, *week in week out*, but ??*month in month out*, **century in century out*, **hour in hour out*, **minute in minute out*.

Because idioms have unpredictable interpretations associated with them, it has been natural to argue that they must be listed in the lexicon. Since they are structurally more complex than individual words, the argument is then that the lexicon should be thought of as consisting of constructions. Constructions are correspondences of phonological form, syntactic properties and meaning, of any size or complexity. In the case of a word, the syntactic properties consist of its category and agreement features such as number and gender. But in the case of idioms, the syntactic properties must also include their phrase structure. Idioms like those in (1a-d) are unexceptional because their structure conforms to the canonical phrase structure of the language; it is necessary to say something special only for the rare idioms like (1e) and (3).

A survey of attested idioms with regular structure, such as (1a-d), shows that they fall into four major subcategories: VP idioms (1a), NP idioms (1b), AP idioms (1c), and PP idioms (1d).⁴ Each subtype has exactly the structure of a possible non-idiomatic phrase of that category. For example, in the case of

⁴ One might also characterize certain proverbs as idioms of category S, e.g., *A stitch in time saves nine* ['Don't procrastinate']. For a different sort of case, *each and every* might be thought of as an idiomatic determiner.

VP idioms, we find variants such as (4). (The underline notation X denotes a variable phrase of category X.)

- (4) a. [_{VP} V NP]: kick the bucket ['die']
b. [_{VP} V PP]: dump on NP ['criticize; accuse']
c. [_{VP} V PP]: ask for the moon ['make an unreasonable request']
d. [_{VP} V NP Prt]: blow NP away ['impress NP']
e. [_{VP} V NP PP]: beat the pants off NP ['defeat NP soundly']
f. [_{VP} V NP PP]: sell NP down the river ['betray NP']
g. [_{VP} V Adj VP_{inf}]: see fit to VP ['consider it correct or acceptable to VP']
h. [_{VP} V it PP S]: get it into NP_{pro}'s head that S ['start to believe that S']
i. [_{VP} V Adv PP]: speak highly of NP ['praise NP']

These are all possible VPs in English. Nothing special has to be said about them, except their meaning. They conform entirely to the way the language works generally: in their phonological form, in the linear order of words, in the interface with prosodic structure, in how their verbs inflect for tense and aspect and agree with their subjects, and so on. In other words, all these properties follow from the structure

that the grammar of the language imposes on well-formed strings of words.

To amplify this point, observe that both idiomatic and literal *kick the bucket* are inflected according to the regular verb inflection (*kick, kicks, kicked*), while idiomatic *blow NP away* and literal *blow* display identical irregular inflections (*blow, blew, blown*). Similarly, consider again the idiom *sell NP down the river*. The variable NP may be a pronoun, a full NP, or a heavy NP. When the NP is pronominal, it must precede the PP, whether in the non-idiomatic constructions (5a,b) or the idiomatic ones (5c,d).

- (5) a. They shipped it down the river.
b. *They shipped down the river it.
c. They really sold us down the river.
d. *They really sold down the river us.

Likewise, a heavy NP can appear after the PP in both a non-idiomatic VP (6a) and the idiom (6b). Both are instances of 'Heavy Shift', which regulates the order of constituents in the VP according to their syntactic, prosodic and information structural properties (Wasow 2002).

- (6) a. They shipped down the river [_{NP} the massive quantity of goods that they had purchased].
- b. They sold down the river [_{NP} all of the people who had been counting on them for support].

In order to properly capture these and all of the other regularities in form, the lexical entry of an idiom must involve not only its individual words, but also the syntactic structure in which the words are arranged.⁵ While there are exceptional cases such as (1e) and (3), whose structure must be specified individually, the formal properties of the vast majority of idioms follow immediately from the canonical structure of nonidiomatic sentences.

2.2. Functional idioms

Another type of idiom assigns a non-literal function to an independently well-formed structure of the language. We refer to these as 'functional idioms'; several are illustrated in (7).

- (7) a. Will you VP?
- b. Won't you VP?
- c. Would you VP?

⁵ Such a dual representation is seen in the model of Arnon & Christiansen, 2017, this issue.

- d. Can you VP?
- e. Can't you VP?
- f. Could you VP?

These cases were discussed at length in Culicover (1971). They have a number of salient properties.

- *Can you, Can't you, etc.* are not constituents.
- *Can you VP* is a constituent, in fact a sentence.
- Each form has a conventional interpretation as an imperative with a particular level of politeness. So, for example, *Will you sit down?* is a somewhat less polite request than *Won't you sit down?*, while *Can't you sit down?* is decidedly rude.
- Each of these constructions, when used with imperative force, has exactly the same form as the corresponding literal yes-no question.

Observations such as this led to the conclusion in Culicover (1971) that each of the forms in (7) is a construction with imperative force. Culicover (1971) argued that it is no accident that it is just these forms that have this force associated with them -- they are adaptations of the systematic, rule-governed structures afforded by the grammar of English.

Bach and Harnish (1979) explain why it is just these forms that have been adapted in this way, based on their literal meanings and the plausible implicatures that they trigger when used in conversation.

Culicover (1971) also discusses the form in (8).

(8) Why don't you VP?

As in the case of (7), *why don't you* is not a constituent. The construction has the form of a *why*-question, surely not an accident. And it has the force of a suggestion. In effect, *why don't you VP* means 'I suggest that you VP'. (And *why don't we VP* means 'I suggest that we VP'.)⁶

Another type of case is illustrated in (9).

- (9) a. What do you think you're doing?
b. Where do you think you're going?
c. Who do you think you're talking to?

⁶English also has three constructions with the same force as *why don't you/we*, but with anomalous syntactic structure: *Why not VP*, *How about XP*, and *What about XP*, all of which express a suggestion and/or offer.

These questions are not really about thinking. Paraphrases are given in (10).

- (10) a. You are doing something and I am not sure I like it.
b. You are going somewhere and I am not sure I like it.
c. You do not realize that I, your addressee, am liable to take offense at what you are saying.

The conditions on this form are complex. The subject of *think* may be the addressee, or it may be a third person (11a). The subject of the sentential complement must be coreferential with the subject of *think* (11b). The sentential complement is preferred without the *that*-complementizer (11c), even though extraction from a *that*-clause is in principle possible (11d). (We use the notation '&' to indicate that an example does not have the intended non-literal interpretation.)

- (11) a. What does Otto think he's doing? Where does Otto think he's going?
b. &What does Otto think I'm doing? &What do you think Otto's doing? &Where do you think Otto's going?
c. What does Otto think (?that) he's doing?
d. &What do you think that Otto tried to do?

Once again we are led to our central observation: these constructions are distinguished not by their form, but by the fact that they are parasitic on the form made available for productive, compositionally interpreted expressions by the grammar.

3. Collocations

Another type of MWC is the collocation. Many collocations are MWCs with literal meanings, but with a special status for the particular combination of words. Some examples are given in (12). (# indicates a non-collocation.)

- (12) a. black and white [cf. #white and black]
b. here and there [cf. #there and here]
c. come and go [cf. #go and come]
d. (walk) up and down [cf. #(walk) down and up]
e. absolutely ridiculous [cf. #absolutely funny]
f. make a change [cf. #do a change]
g. do an experiment [cf. #make an experiment]
h. a big decision [cf. #a large decision]
i. mow the lawn/grass; cut the #lawn/grass
j. fast and furious [cf. #furious and fast]

k. this and that [cf. #that and this]

There are many thousands, perhaps tens of thousands, of such collocations (Jackendoff 1997, chapter 7).

One special category of collocations consists of so-called 'light verb constructions'. These are collocations of a noun phrase that conveys thematic structure with neutral verbs such as *have*, *take*, *make*, *do*, as in (13).

- (13) a. take a walk ['walk'; #have, #make, #do a walk]
b. have/take a drink ['drink'; #make, #do a drink]
c. make/have/take a try ['try'; #do a try]
d. do a review ['review'; #take, #make, #have a review]
e. make a decision (American); take a decision (British)

The interpretation of light verbs is predictable to some extent from the interpretation of the noun. For example, *take a walk* denotes walking. As before, the formal properties of light verb constructions are those of canonical V-NP verb phrases.

Other collocations involve the pairing of heads and complements in what appears to be a non-systematic way. For example, in English there are seven verbs that can pair with an

adjective with the meaning 'become': *become, get, turn, fall, come, go, grow*. But not every verb pairs with every adjective. Not surprisingly, the verb *become* can take any adjective as complement --

(14) become { red
tall
taller
obvious
angry
strong
silent
loose
ugly
crazy }

But the other verbs select restricted classes of adjectives. For instance, the data for *get* and *turn* appear in (15)-(16).

(15) get { red
tall
taller
#obvious
angry
strong
silent
loose
ugly
#crazy }

(16) turn { red
#tall
#taller
#obvious
#angry
#strong
#silent
#loose (in the sense of 'become loose')
ugly
#crazy }

One might suppose, as do Bybee and Eddington (2006) in their study of similar cases in Spanish, that the observed V-Adj pairs are distinguished simply by their statistical properties. But, while *become* pairs freely with adjectives, the other verbs have selectional properties that account at least in part for the statistical distribution. These are summarized in (17).

- (17) a. *get*: Adj denotes a position on a scale, e.g. *get angry, get angrier*
- b. *fall*: Adj denotes an absence, e.g. *fall silent, fall dead, fall asleep*
- c. i. *turn*: Adj denotes a negative property, e.g. *turn bad, turn dark, turn sour, turn ugly*
- d. ii. *turn*: Adj denotes a color, e.g. *turn red, turn orange, turn blue*
- e. *come*: Adj denotes a positive change, e.g. *come alive, come clean, come free, come loose, come open, come true*
- f. *go*: Adj denotes a dramatic or extreme property, e.g. *go bad, go black, go blind, go crazy, go wild*
- g. *grow*: Adj denotes a higher position on a scale, e.g. *grow better, grow big, grow restless, grow tired*

The observed restrictions show that some apparent collocational phenomena may have a partly semantic explanation. In this case, the explanation involves specifying the lexical entries of the individual verbs that mean 'become', and restricting their combinatorial properties with respect to their adjectival complements in the configuration [_{VP} V AP].

Note finally that the term "collocation" is also often used to refer to a sequence of words that do not necessarily form a constituent and have no special interpretation but appear to have some psychological status as a processing unit. Let us call these 'pure' collocations. Typical examples are *it's a*, *do you wanna*, *have a*, *see the* and so on.

A pure collocation comprises several distinct components of the interpretation – e.g., *it's a* consists of a pronominal subject, the present tense copula, and a determiner. This interpretation arguably is not computed online, but is stored as a part of the collocation. It is plausible that pure collocations reflect the tendency of the language processor to bypass grammar-driven parsing and interpretation where possible (Ellis, 2017, this issue). An account of how the language processor is organized would certainly incorporate pure (and other) collocations.

But even if pure collocations are listed in speakers' lexicons, their structure is entirely determined by the rules that must independently be part of the grammatical description.

4. Compounds

Compounds are MWCs that function syntactically as words rather than as phrases. Some examples of English noun-noun compounds are given in (18).

- (18) a. car chase ['chase of a car']
b. bat boy ['boy who picks up bats', or, 'boy who looks like a bat']
c. tire track ['track made by a tire']
d. man cave ['cave for a man to occupy']
e. tree house ['house in a tree']
f. firewood ['wood for a fire']
g. dog person ['person who likes dogs']
h. bird dog ['dog for tracking birds']
i. dog biscuit ['biscuit to be eaten by a dog']
j. animal cracker ['cracker shaped like an animal']
k. car coat ['coat to be worn in a car']

English also has noun-adjective compounds, illustrated in (19).

- (19) a. fire engine red ['red like a fire engine']
b. car sick ['sick from riding in the car']
c. girl crazy ['crazy about girls']
d. house poor ['poor because of a house']
e. trigger happy ['eager to pull the trigger']

Even these few examples illustrate some striking facts about compounds. First, their interpretation is not always predictable from the interpretation of their parts and their structure. The structure of a noun-noun compound is simply [_N N N] and that of a noun-adjective compound is [_A N A]. In some cases the interpretation is idiomatic, e.g. *trigger happy*, and in some cases it is simply unspecified, as in *X-ray*. Jackendoff (2010) argues for no less than fourteen classes of semantic relationships to be found among English compounds, plus generative principles for constructing more complex relationships, such as in *bike helmet* 'helmet to be worn while riding a bike'. But in any given case, the actual relationship is either conventional, or made up on the spot.

A second fact about compounds is that they are X^0 s, i.e. nouns, adjectives, or verbs, rather than phrases. Hence it is straightforward to construct arbitrarily complex compounds by taking each N to be an N-N compound itself. Jackendoff (2010)

gives the example *child camel jockey slavery* from the New York Times of 3 June 2007. Here are some other real ones:

- (20) a. Arts and Sciences chairs short term planning committee
- b. National Book Critics Circle Award
- c. distribution system improvement charge price change
- d. braised beef tongue toast
- e. Math Recovery Intervention Specialist Handbook
- f. childhood lead poisoning prevention program property transfer lead paint notification package [a document involved in a real estate closing]

Each compound is a noun, and it pluralizes like one by taking the appropriate plural morphology on the final noun, the head, e.g. ... *Awards*, ... *toasts*.

Compounds, like idioms, show that the rules of the grammar apply equally to license both conventionalized MWCs that are stored as lexical items and novel MWCs such as *software engineer training program fee* (which we have just made up). The complex items in the lexicon that conform to more general structural principles (e.g. idioms such as *kick the bucket*, *sell down the river*) and compounds (e.g. *snow man*, *bat boy*, *girl crazy*) can be treated simply as specialized instances of general schemas.

5. Constructions

We conclude with syntactic constructions that are MWCs, but not idioms in the sense of section 2. As noted, the classic notion of 'construction' is one of a correspondence between form and meaning (or function). The most familiar examples of constructions are those whose interpretation cannot be determined compositionally. In this sense, most of the phenomena discussed above, except pure collocations, are constructional.

But there are other constructions that are more than simply lexically restricted versions of productive structures. (21) illustrates some that are discussed at length in Culicover (1999) and Culicover and Jackendoff (2005).

- (21) a. He refuses to work, no matter (how big) the salary.
[no matter]
- b. Sandy went to the movies but I don't know who with.
[Sluice stranding]
- c. The more I eat, the happier I am. The bigger they are
the harder they fall. [Comparative correlative]

The *no matter* construction in (21a) is characterized by *no matter* + wh-phrase, but it lacks a verb. Sluice stranding (21b)

appears to allow only a restricted set of pairs of wh-word and preposition (e.g. ... *I don't know who with* but **I don't know who without/against*, *... *I don't know what after/under*).

The comparative correlative (21c) is very productive -- it allows comparison of quantities expressed as NPs, APs or AdvPs. Notice that with APs and AdvPs, it follows the standard comparative pattern of *more* with polysyllabic adjectives and *-er* with monosyllabic adjectives and bisyllabic adjectives ending in *-y*: *the more beautiful she is* vs. *the prettier she is*. However, its overall syntactic structure – two clauses joined paratactically, each of which is introduced by *the* plus a comparative phrase – is idiosyncratic to this particular construction.

A last construction of some interest is *can't seem to*, illustrated in (22), discussed originally by Langendoen (1970).

(22) Terry can't seem to stay out of the cookie jar.

While *seem* with a referential subject alternates with *it seems* (23a), *can't seem* does not (23b). Rather, the acceptable alternation is one in which *can't* is in the subordinate clause (23c)

- (23) a. Terry seems to like cookies; It seems that Terry likes cookies.
- b. *It can't seem that Terry stays out of the cookie jar.
- c. It seems that Terry can't stay out of the cookie jar.

At first glance it appears that *can't seem to* is an idiom (hence a MWC) with the interpretation 'seem to be unable'. But the following examples show that the idiom must be stated in terms of sentential negation scoping over *can* and *seem*, as Langendoen observed.

- (24) a. No one can seem to get it straight.
- b. Parents of few children can seem to take good care of their children's education

Here, the negative operator is in the subject, not in the auxiliary, yet it licenses the construction.

Furthermore, topicalized negative phrases that trigger negative inversion also have sentential scope; they too license *can seem to*.

- (25) a. On not many occasions could anyone seem to understand what was happening.
- b. On not many of those problems can he seem to make any progress.
- c. Only on rare occasions could Terry seem to operate the espresso machine.

Never, scarcely, hardly and similar adverbs also license *can seem to* when they are in the auxiliary (26a), but not if they are elsewhere (26b).

- (26) a. He can never/scarcely/hardly/rarely/barely seem to solve those problems.
- b. *He can seem to never/scarcely/hardly/rarely/barely solve those problems.

Finally, sentences with restrictive *all* and semantically parallel operators show the same pattern. There is no literal negative element in the sentences in (27), yet the restrictive interpretation in the relative clause licenses *can seem to*.

- (27) a. All I can seem to do is the first problem.
- b. The only thing that I can seem to do is pick up the phone and call room service.

- c. One of the few things that I can seem to do is pick up the phone and call room service.

These examples show that the idiom here is indeed a MWC, but one that has to be stated not just in terms of particular forms in a particular sequence -- *can seem to* -- but instead as a complex negative polarity item, rather like *any*.

6. Implications for the status of rules of grammar

It is clear that speakers store thousands of MWCs in the lexicon, right alongside words. We have seen here, though, that with few exceptions, MWCs conform to normal syntactic and morphological patterns of the language. We conclude by discussing what this implies for the nature of grammatical rules.

In the generative tradition, rules have been treated as procedural: informally, "expand an S as an NP plus a VP", "move a wh-phrase to the front of its clause", "insert a lexical item under a terminal node in a syntactic tree". A freely generated VP such as *throw the pail* is created by expanding VP into V plus NP, expanding NP into Determiner plus Noun, and inserting *throw*, *the*, and *pail* independently under V, Det, and N respectively. The meaning of the phrase is computed from the stored meanings

of the three individual words, guided by their syntactic configuration.

It might be claimed that characterizing the possible structures of a language in terms of the computations that generate them is simply a convenient metaphor. But it is more than that, even in contemporary versions of generative grammar. For instance, Chomsky's notion of economy in the Minimalist Program (Chomsky 1995) relies crucially on the number of computational steps required to derive a discontinuous dependency.

MWCs have always been problematic for this procedural conception of rules. For instance, an idiom like *kick the bucket* must be stored in the lexicon and inserted all at once as a VP, along with its idiomatic meaning – in other words, it cannot be inserted word by word in canonical fashion. However, if it were inserted as a chunk, the fact that this VP has normal VP structure and that its verb inflects like a normal verb would not be captured in a systematic way in the grammar – its structure would have no connection with the rule that generates novel VPs. Its structure could be completely *sui generis*, just like the extremely rare examples such as *so be it*.

Observing this overlap between the structures of idioms and the productive structures of the language, Jackendoff (1975) proposed that phrase structure rules, which are normally generative, can also be used as “lexical redundancy rules,” which license or motivate the structure of stored phrasal expressions. At the time, this proposal could not be fleshed out in more precise terms, because the formalisms for phrase structure rules and lexical redundancy rules were incompatible.

The advent of constructional approaches to syntax (e.g. Goldberg 1995, Culicover and Jackendoff 2005) has made possible a rapprochement: procedural phrase structure rules are replaced by declarative schemas or templates for licensing pieces of well-formed syntactic structures. Instead of “expand a VP as a V plus an NP”, or “build a VP by merging a V and an NP”, as in (28a), they take the form “a V plus an NP constitutes a legal VP,” as in (28b). That is, this general schema licenses a string of words that consists of a member of the category V followed by a subsequence that can be analyzed as an NP.

- (28) a. $VP \rightarrow V NP$
b. $[_{VP} V NP]$

Such licensing can be achieved in two ways. First, the schema can be applied to arbitrary strings that satisfy its constraints: its variables can be instantiated with items from the lexicon or with other schemas to form a novel expression, just like a traditional rule. We call this the *generative* use of the schema. But the schema can also be used *relationally* to measure the extent to which stored items in the lexicon conform to the canonical patterns of the language (Culicover 1999, 2013). For instance, the structure of the idiom *chew the fat* (29a) and of the collocation *chew gum* (29b) contain within them the VP schema (28b), except that they instantiate the schema's variables, i.e. fill them with content.

- (29) a. [VP [V chew] [NP [Det the] [N fat]]]
 b. [VP [V chew] [NP [N gum]]]

The relation between the schema and its lexically specific instances is often characterized in terms of *inheritance*: the MWCs in (29) inherit their syntactic structure from the schema. At the same time, the individual words of the MWCs inherit their syntactic category, their morphological structure, and (in the case of the collocation but not the idiom) their meaning from the independent words *chew*, *the*, *fat*, and *gum*. In particular, irregular verbs in idioms inflect just like their independent

counterparts, e.g. in our earlier example *sell/sold NP down the river*. By virtue of this inheritance relation, the lexicon is simplified (Pollard and Sag, 1987, Goldberg, 1995).

We do not go into the mechanisms of inheritance or its generalizations here (see Jackendoff and Audring, 2016; in preparation). The main point is this: **by granting schemas this relational function alongside the generative function, we can immediately consolidate the structural regularities in stored MWCs with those of freely licensed novel structures.**

Other syntactic patterns are lexically restricted. One case mentioned above is sluice-stranding, which allows (*...but I don't know*) *who with/what for* but not **... who about/what beside*. Similarly, the light verb construction licenses a huge variety of instances, but one is not free to make up new ones. A more complex case, also mentioned earlier, is *drive NP [or go] nuts /crazy /bananas /insane / wild /*demented/ *meshuga*. Here the choice of NP is free and can be satisfied generatively, but the verb must be either *drive* or *go*, and the adjective has to be one of a designated subset of words denoting extreme states of mind.

The possibilities are not predictable, so they have to be listed.⁷

In each of these cases, then, there is a schema that captures the general pattern. But it functions only relationally, and does not lend itself to free generation of novel forms.

Significantly, the same contrast between two kinds of schemas appears in morphology. On one hand, some morphological patterns are completely productive, aside from listed exceptions, for instance the regular English plural in *-s* (*coelacanth*s), the regular present participle in *-ing* (*obfuscating*), and perhaps the deadjectival noun in *-ness* (*picturesqueness*). One can immediately apply these patterns to new words, as shown by the well-known *wugs* test (Berko 1958). Yet at the same time, one surely stores many instances of these patterns, e.g. *trousers*, *being*, and *happiness*. Similarly, as seen above, compounding is productive – new ones are coined all the time – but the compound schema also supports thousands of lexically listed instances.

⁷ It is still more arbitrary: we have *drive NP up the wall* and *go postal* but not **go up the wall* (= 'go crazy') or **drive NP postal*.

On the other hand, many (perhaps most) morphological patterns are not productive. One has to learn, for example, that the irregular past tenses of *sing* and *cling* are *sang* and *clung* rather than **sung* and **clang*. Similarly, one has to learn that the nominals of *confuse* and *refuse* are *confusion* and *refusal* rather than **confusal* and **refusion*. Yet there are clear patterns that can be captured by schemas: there are about a dozen verbs that work like *sing/sang* and about the same number that work like *cling/clung*; there are hundreds of *-al* nominals and thousands of *-ion* nominals. However, the relevant schemas function only relationally; their instances have to be listed.

These nonproductive morphological patterns are what led to the notion of lexical redundancy rules in early work such as Jackendoff 1975. It is now possible to nicely characterize their relation to phrase structure rules. In the present approach, both are realized as schemas that can be used relationally within the lexicon. "Lexical redundancy rules" are schemas over morphological structure that have only the relational function, while "phrase structure rules" are schemas over phrasal syntactic structure that can be used either relationally or generatively.

A different way of looking at this result is this: **All** rules of grammar can serve in the relational role, capturing generalizations among stored items. But in addition, some of the rules – those that are fully productive⁸ – have in effect “gone viral”: they can be used to create an unlimited number of new expressions.

The upshot is that MWCs have much the same status as morphologically complex words. They are stored in the lexicon, but at the same time their structure is supported or motivated by structural schemas that relate them to larger patterns in the language. This point is developed in more detail in Jackendoff and Audring (2016; in preparation).

These parallels between MWCs and morphologically complex words suggest as well a parallelism in how they are acquired. Learners plausibly first acquire complex words as unanalyzed units. Only later are they able to identify morphological structure. The identification of such structure forms the basis for positing rules of word formation, however these might be characterized. It is equally plausible that such a progression may take place in the domain of syntax. On this view, learners

⁸We leave open the question of what constitutes productivity, the nature of gradient productivity, etc.

could acquire multiword sequences as unanalyzed units (Farron & Christiansen, 2017, this issue; McCauley & Christiansen, 2017, this issue; Theakston & Lieven, 2017, this issue). More general constructions would emerge as learners identify systematic correspondences between form and meaning (Tomasello 2003, Culicover and Nowak 2003).⁹ For both syntax and morphology, discovering which constructions are productive and which are not would then constitute a subsequent step.

The existence and sheer quantity of MWCs, then, does not undermine the notion that speakers structure their language in part by means of an abstract grammar. One cannot get rid of rules. However, MWCs do play a major role in arguing for the abandonment of traditional *procedural* rules. The proper revision of the theory is to reconceive of rules as declarative schemas, with the dual function of supporting generalizations within the lexicon and, in certain cases, permitting the unlimited creativity that remains a hallmark of language.

⁹Of course, we cannot rule out a priori the possibility that other, more “top-down” processes are also at play.

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