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# Mapping Meaning onto Use

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## **Introduction**

The job of the dictionary maker is traditionally seen as being to compile an inventory of the words in the language, and to say what they mean, either by paraphrase in the same language, or by translation into a different language. Even this simple statement prompts hedges, however. ‘An inventory of the words in the language’ cannot mean ‘an inventory of *all* the words in the language.’ The vocabulary of any living language is dynamic, and a glance at the rare words in any large corpus will reveal many words that are most unlikely to recur, for example *giraffishness* and *camelization*.

Until the mid 1980s, lexicographers were reliant on individually collected citations and introspection for evidence. For this reason, it was not always easy to distinguish between a rare but conventional word on the one hand and, on the other, a dynamic coinage, no sooner coined than forgotten – unless caught by some accident in the fine mesh of a lexicographer’s trawl net. Dynamic lexical coinages are created, more often than was generally acknowledged before the advent of corpus evidence, out of the basic morphology and phonology of a living language. Some of these dynamic coinages have crept into dictionaries, as if they were conventional words. Other items are borrowed wholesale from the lexical systems of other languages, and it is not always easy to distinguish between a foreign borrowing and a term that is more or less fully naturalized.

## **A Small Infinite Set**

For these and other reasons, the notion of an inventory of *all* the words in a language is incoherent. When we have recorded all the known words, there is always one more. The number of possible words in a language is infinite. But this does not mean that the actual population of words is a very large number. Infinite means ‘unbounded’, not ‘unimaginably large’ (although the two concepts are sometimes confused in colloquial usage). If we abstract away names and errors, and ad-hoc coinages, the number of conventional vocabulary words in the English language is much less than 100,000 by any reasonable definition of ‘conventional’ and ‘word’. More than three quarters of them are

nouns. The lexicon of a natural language is a small infinite set, dominated by nouns.

An even smaller infinite set is the number of meanings associated with each word. In standard dictionaries, most words are given only one or two senses. Even the most complex words are given fewer than ninety-nine senses. And close examination suggests that in many cases, multiple senses in dictionaries represent nothing more than a failure to get the right level of generalization, or confusion of differences in context with differences in meaning.

The advent of large corpora in the 1990s, including in particular the Bank of English and continuing with the British National Corpus, introduced a new perspective. Corpora of 1 million words are simply too small for the patterns of usage of individual words to be identified clearly. But in a corpus of 100 million words, a simple right- or left-sorted concordance shows clearly most of the normal patterns of usage for all words except the very rare or very unusual. Other aspects of patterning emerge through more elaborate computational analysis.

### Defining the Word or the Context?

Despite heroic efforts by British learners' dictionaries since the 1980s, there is still much to do, lexicographically speaking, in coming to terms with corpus evidence. Old assumptions are slow to die. Dictionaries, even dictionaries for foreign learners, give equal prominence to rare and unusual words and senses, alongside ordinary conventional usage. Sometimes, indeed, the rare and usual words and senses are given prominence at the expense of the ordinary. For dictionaries aimed at native speakers, this may be a correct (or at any rate a defensible) perspective. At least part of the purpose of a native-speaker dictionary is to extend a user's understanding of unusual words. But the fact remains that giving equal prominence to all senses, when they are not equally common, is a distortion. Even when a word really does, indisputably, have more than one sense, generally just one of the senses accounts for over 80% of the uses, while the others are rare. For foreign learners and computational applications alike, lexicographic analysis needs to show a sense of proportion (or, rather, it needs to show the proportions of senses).

Corpus evidence highlights other formerly neglected issues, too, for example the pragmatics of words in use. A spoken corpus shows, for example, that in English conversation the word *right* is often used to signal conversational cooperation or acceptance of what is being said, more often than to express the truth-functional sense "factually true or correct". The expression *if you like* is

used to invite conversational cooperation or acceptance of a new concept or a new way of expressing an idea. “This is, if you like, a widget” invites acceptance of the term *widget*. It does not mean that the speaker is willing or able to turn the object in question into something completely different if the hearer takes a dislike to it.

Explanations in traditional dictionaries are driven by truth-functional notions of semantics, and tend to overlook (or explain very badly) pragmatically terms and function words such as discourse organizers (e.g. *anyway, however, all the same, be that as it may*), modal verbs, determiners, and pronouns. But now lexicographers are taking a long, hard look at the different functions of words in language in use, rather than pretending that all terms are truth-functional.

Up to now, standard dictionaries have been able to get away with wrongly focused explanation of terms such as those just mentioned on the grounds that (in the words of at least one dictionary publisher) “nobody will look them up anyway” – or because the dictionary buying public is hugely trusting of the expertise of the printed dictionary, and does not know that anything better could be expected from the inventorists of the language. (It is as if the inventory clerks in an electronic equipment store were required to classify all the items in the store according to the materials out of which they were constructed, without any reference to the different purposes for which they are used.)

But this is changing. Future developments in corpus-based lexicography will be driven more and more by the needs of machines and of man-machine interaction. For activities such as information retrieval, message understanding, and machine translation, it is essential to identify the different linguistic functions of the words of a language, to prioritize, and to tease out the apparent complexities of language, with the aim of identifying and presenting a well-organized account of the underlying simplicities that make communication possible.

An important challenge in information retrieval is matching related search terms – in the words of Greg Notess, “getting away from the tyranny of text matching”. Compiling satisfactory sets of related search terms depends on distinguishing one sense from another. ‘Seizing a cargo’ is equivalent to ‘impounding a cargo’, but ‘seizing a city’ is equivalent to ‘occupying a city’, not ‘impounding a city’. ‘Toasting a piece of bread’ is equivalent to ‘grilling a piece of bread’, but ‘toasting a champion’ is not equivalent to ‘grilling a champion’. Sets of related search terms have to be matched to senses or contexts, not merely to words.

Existing dictionaries may be guilty of sins of omission (e.g. in accounting for pragmatics and function words), but they are equally guilty of sins of commission. They can make things seem even more complicated than they really are. In part, this is because the structure of a traditional dictionary entry is dictated by meanings not by use. Word meaning (if such a thing exists at all) is extremely vague and unstable. A word can have about as many senses as a lexicographer cares to perceive. Moreover, as Atkins and Levin (1991) point out, it is often difficult or even impossible to map the semantic distinctions made by one dictionary onto those of another. More specifically, human beings have a natural tendency to define the context (without admitting, even to themselves, that they are doing so), rather than focusing on the particular contribution of the word to the contexts in which it occurs. An extreme example, mercifully cancelled before publication, was a proposed definition of *throw* as 'to behave in a wild and uncontrolled manner'. When challenged for evidence, the lexicographer who wrote it pointed to the expressions '*throw a fit*' and '*throw a wobbly*'.

Less striking examples can occasionally be found in published monolingual dictionaries, having slipped through the editorial net.

Two approaches are possible in attempting a solution to this problem. One, characteristic of 19<sup>th</sup>- and 20<sup>th</sup>-century monolingual dictionaries, is to distort the natural syntax of the defining language in order to force it to fit and be substitutable for the word itself and not the context. The other, characteristic of bilingual dictionaries and Cobuild, is to pay more attention to the phraseology of usage, so that a word can be defined in its most natural context(s), or indeed so that the contexts themselves, as a whole, can be explained or translated after being stated explicitly. For this to work effectively for the user, the lexicographer must first group the corpus evidence for each word according to the contexts in which it occurs, and then decide to what extent it is possible to group different contexts together (on the grounds that they express what is essentially the same meaning), and to what extent it is necessary to make distinctions.

With the advent of large corpora, it is possible to be much more precise about the typical contexts in which a word is used, and to associate different meanings with different contexts. The crucial point here is to choose, as an organizing principle for the dictionary entry, *context* (which is objectively observable and measurable) rather than *meaning* (which is opaque and depends on the perceptions of the definer). Lexicographers should think first in terms of syntax and context (or, more strictly, syntagmatics), rather than directly in terms

of semantics. They can thus approach meaning indirectly, through syntagmatic analysis, according to a motivated grouping of the evidence. Of course, traditional dictionaries already distinguish noun senses from verb senses, and transitive verbs from intransitive verbs. What is suggested here is that the organizing principle should be both more delicate and richer. The semantic classes of words ('lexical sets': see Hanks 1996) in the co-text surrounding a target word can function as the organizing principle for the lexicographic description of the target word.

Words with a valency of three will not be treated as if they have a valency of only two, so for example the obligatory adverbial of location (e.g. 'down', 'on the table', etc.) of *put* will not simply be ignored.

Until very large corpora became available, it was not clear that such an approach was even possible. It is now clear that it is entirely practicable.

### **Contrastive Analysis in Frame Semantics**

The analysis of different senses of words in different contexts, and of different words with similar meanings, has been greatly influenced in recent years by the theory of frame semantics, developed by Fillmore and Atkins, on the basis of Fillmore's earlier work on case grammar and Atkins's earlier work on lexical analysis. In a seminal passage, they write:

A word's meaning can be understood only with reference to a structured background of experience, beliefs, or practices, constituting a kind of conceptual prerequisite for understanding the meaning. Speakers can be said to know the meaning of a word only by first understanding the background frames that motivate the concept that the word encodes. Within such an approach, words or word senses are not related to each other directly, word to word, but only by way of their links to common background frames and indications of the manner in which their meanings highlight particular elements of such frames.

(Fillmore and Atkins 1992: pp. 76-77)

These conceptual (semantic) frames are related to syntactic frames, giving actual expression not only to the concept expressed by the word itself, but also to other words and expressions that, typically, are put together with the word when people use it to make meanings. Central to the analysis of a syntactic frame is the notion of *valency*:

Each lexical item, or idiomatized phrase, can be associated with what can be called its valence description, a description that specifies, in both semantic and syntactic terms, what the expression requires of its constituent and its context, and what it contributes to the structures that contain it. (op. cit.: p. 78)

The term *valence* or *valency* was borrowed (originally by the French syntactician Lucien Tesnière, 1959) from chemistry, where it is used to express the atomic structure of molecules. Applied in linguistic analysis, it indicates the number of other terms to which a term (typically a verb) relates syntagmatically. So, for example, *die* has a valency of one: it is normally an intransitive verb with no direct object or adjunct. *Kill* has a valency of two: it expresses a relationship of the action both to a killer and a victim. *Put* has a valency of three: not only does it relate to the person doing the putting and to the physical object being put; it also relates to the place where the physical object is put.

Where linguists in the European tradition talk of valency or valence descriptions, linguists trained in the American transformational-generative tradition use the term *argument structure*. The two concepts are very similar. However, there is this difference: *argument structure*, a term taken from formal logic, necessarily implies an underlying logical form of a clause or proposition, whereas *valency* does not. For this reason, the notion of valency is both more powerful and more flexible than that of argument structure. It can, for example, deal with performatives such as *I promise ...* It can describe structures without having to transform them into a presupposed underlying logical structure. The valency of a word is simply an analysis of its relationship, actual or potential, to other words in clauses in which it is used. Relating the valence description of a clause to the logical form of a proposition is an additional step, which may or may not be taken. Given that Fillmore and Atkins want to relate clause structure to a fairly delicate system of semantic roles, *valency* (or *valence description*) is a more appropriate term for this kind of lexical analysis. "First, let's get the syntactic structure clear," they might say. "Then let's relate that structure not only to a logical form but also to the whole conceptual framework within which the word exists." Syntactic structure and semantic structure are independent variables, and relating them is an interesting challenge for lexicographers and linguists alike.

Having introduced the notion of valence descriptions, Fillmore and Atkins go on to present a case study of the word *risk*, showing how the whole context fits together in a broad semantic frame, while different contexts affect the meaning of the word. At a high level of generality, *risk* and semantically related words (including the nouns *danger*, *peril*, *hazard*, and *venture*, and the verbs *gamble*, *invest*, and *expose*) all share the notion of *the possibility of an unwelcome outcome*. But not only are there contrasts among the different words; there are also different meanings arising from different contexts or uses of the same word.

Fillmore and Atkins discuss the semantic frame of *risk* in two important papers: (1992) and (1994). There is some variation of terminology. In the 1994 paper (p. 367), the relevant frame elements are presented as follows:

**Protagonist:** the central person in the frame

**Bad:** the possible bad outcome, or harm

**Decision:** the decision that could trigger this

**Goal:** the desired outcome

**Setting:** the situation within which the risk exists

**Possession:** something or someone valued by the Protagonist and endangered by the situation

**Source:** something or someone which could cause the harm.

These frame elements are very similar (but different in interesting respects) to those presented two years earlier:

**Chance:** uncertainty about the future

**Harm:** the possibility of an unwelcome development

**Victim:** the individual who stands to suffer harm

**Valued object:** the thing that is in danger of being lost or damaged (e.g. one's money or good name)

**Situation:** the state of affairs within which someone might be said to be at risk

**Deed:** the act that brings about a risky situation

**Actor:** the person who performs the act that puts someone or something at risk.

And four secondary categories (all concerned with Actor's intentions):

**(Intended) Gain:** Actor's hoped-for gain in taking a risk (e.g. *you've risked your health for a few cheap thrills*)

**Purpose:** Actor's intention (if any) in doing the risk-inducing act

**Beneficiary:** the person for whose benefit something is done

**Motivation:** the psychological source of Actor's behavior

It is immediately clear that frame semantics is a much richer schema for representing meaning than is used in any current dictionary. It might be objected that this schema invokes excessively subtle distinctions, some of them quite far removed from the valency of risk itself in any normal context of use. However, this would be to miss the point. The point is that, to use *risk* – or any other word – correctly, one must understand the whole context in which it is used, and know the roles of all the players, and that these roles, whether present or absent in any particular utterance, must be specified as part of the meaning of the word. The players, or rather, more strictly, an idealization of the playing positions, must be understood before meaning can take place.

Any cricket player who has ever read definitions of cricketing terms written by baseball-playing Americans, or any baseball player who has ever read definitions of baseball terms written by cricket players, or indeed anyone who has ever tried to write definitions of the terminology of card games, will

appreciate the point being made here by Fillmore and Atkins, which is that the meaning of a term can only be fully understood in the full context of the relevant “specific schematization of experience”. To know what a *googly* is, the reader must understand the whole semantic frame of the game of cricket, focusing in particular on the different techniques used by bowlers in their attempts to get batsmen out. To avoid solecisms, the definer writing definitions of such terminology will ideally himself or herself be a user of the terms.

Not all of the frame elements are always explicitly present in the text on every occasion when a term is used, but in order to understand the meaning of the term fully, it is necessary to understand that whether realized in actual words or merely implied, all these roles are present.

Where does all this leave the definition writer? Well, in the first place, it reminds her or him that it is necessary to take account of the domain and semantic context in which different senses of words are used. It is often difficult for compilers of dictionaries and glossaries to decide how much knowledge can be assumed on the part of the reader, and how much explicit contextualization is necessary in a definition. A good starting point is to examine the evidence for the various semantic frames within which the words is used, and to draft classifications of the different sets of relevant frame elements accordingly.

Secondly, it reminds the definition writer to take a long hard look at the different syntactic contexts in which each word is used. I shall return to this point shortly.

Fillmore and Atkins note that the noun *risk* often occurs in the predicate phrase *at risk* (*these children are at risk*), with a slightly different meaning from the phrase *at the risk of*, where the nature of the potential Harm is specified (e.g. *at the risk of seeming stupid*). As a direct object it occurs most often after the verbs *take* and *run*. They comment,

We have found no dictionary that offers an account of the difference between *run a risk* and *take a risk*. (p. 85).

They draw attention to this difference: that *taking a risk* is a deliberate, voluntary act, while *running a risk* has a broader meaning, encompassing also involuntary actions, as in 1.

1. *Puppies in closed cars on hot days run the risk of heat stroke.*

But does this distinction belong in a dictionary, and if so does it belong under the headword *risk*? This is fairly typical of the kind of issues that confront the working lexicographer on a day-to-day basis, analysing corpus evidence. The lexicographer must decide, not only whether such a fine distinction justifies the amount of space that it would require, but if so, where the distinction should be



made (are there other, similar distinctions between *take* and *run*, involving different direct objects?), and above all how much time to devote to agonizing over the issue. A good lexicographical training will alert the trainee to such subtleties, at the same time as insisting on the virtues of a sense of proportion in practical lexicography.

Confirmation of the relevance of the Protagonist's intention as an important element in the *risk* frame comes from examination of verb uses. The verb is always transitive, but the semantic roles of the direct objects can be very different, as the following examples make clear:

2. *He risked his life* [[Valued Possession]] *for her* [[Beneficiary]].
3. *He risked his life* [[Valued Possession]] *by going for a swim* [[Deed]].
4. *He risked being drowned* [[Harm, Bad Outcome]].
5. *He risked going for a swim* [[Deed]].

In 2 and 5, the Protagonist is clearly risking his life intentionally for some beneficial outcome. In 4, it seems equally clear that he is risking his life unintentionally. At the very least, the examples in a dictionary should be chosen to indicate the range of contrasting semantic roles of the typical direct objects and motivations, if any.

## Case Studies

*Risk* is a sophisticated and complex concept. The rest of this paper consists of two much simpler case studies, illustrating how modern lexicography can approach the analysis of corpus evidence for verbs, adjectives, and nouns, and come up with results that map meaning onto use. Frame Semantics will be taken into account, but the focus will be on more basic syntagmatic distinctions. How many different senses does a given word have, and how can we distinguish one from another?

### Case Study 1: *lean*

#### *Getting started*

The corpus is a 250 million word corpus, consisting of the “balanced and representative” British National Corpus, counterbalanced by American texts from four years of the Associated Press Newswire. Unfortunately there is as yet no American National Corpus. The word selected for analysis is *lean*, which illustrates most of the most basic issues that come up in mapping meaning onto use.

Corpus analysis of the lexicon of a language depends on sampling and concordancing. The first step is to decide what to sample. In the case of *lean* this is comparatively easy: we can start by using a regular expression (*lean\**) to get from the corpus all the strings beginning with the four letters *l-e-a-n*. In the case of other short words, such as *set* and *go*, the process of sampling calls for more ingenuity, both to exclude words that are not part of the lemma (*settee* and *settle* are not part of the lemma *set*, nor *goat* of *go*) and to include irregular forms of the lemma (*went* has nothing in common, orthographically speaking, with *go*). Some corpus tools packages include a lemmatizer, in which all forms of a lemma are stated in advance. But even a lemmatizer cannot deal effectively with the small number of cases, e.g. *found* and *wound*, in which forms of one lemma are inextricably interwoven with forms of another. For such cases, only manual sorting on contexts (or very sophisticated context-sensitive automatic lemmatization, which comes to much the same thing) can distinguish them. But for most words in English, a fairly simple string search, with wild cards and options, usually gets satisfactory results.

To start the analysis of *lean*, I selected 510 lines at random and eliminated 10 of them, mostly oddities and lines with misprints (for example, errors for forms of *learn*), from which nothing can be learned about the meaning and use of *lean*. A small margin for irrelevant items is always a wise precaution. For practical purposes, samples smaller than 500 lines can often be sufficient to give an overview for purposes of structuring a dictionary entry.

The first step after elimination of irrelevancies is sorting by lemma. The English word *lean* is well established as both a verb and an adjective. Noun senses are more debatable, as we shall see. As it happens, the verb and the adjective have different etymologies: both words are of Germanic origin, and they were spelled and pronounced differently until the Middle English period, when they fell together. The verb is Old English *hleonian*, related to Greek *klimax* 'ladder'; the adjective is Old English *hlaene*. But from the point of view of the analyst of conventional modern usage, the origins are irrelevant. What matters is identifying the conventions of meaning and usage (linguistic behaviour) that members of a speech community rely on in order to use words to communicate with one another.

Working with a 500-line sample, we sort all the occurrences into different categories, first on broad syntactic grounds (separating adjectives from the verbs), then into more delicate semantic and syntactic frames (e.g. separating 'lean meat' from 'lean businesses') and finally making more subtle distinctions on semantic grounds (e.g. separating different meanings of 'lean on someone',

according to the perceived purpose of the person doing the leaning, i.e. reliance or choice). The sorted results may be seen in Appendix I. It should be emphasized that the level of detail used in categorization of corpus lines is a matter of choice and judgement: even more delicate subcategorization is possible, or different patterns may be lumped together in a single category.

### *Analysing Verb Senses*

The sortal categories required differ in matters of detail from word to word, and are dictated, at least in part, by the patterns observed in the corpus rather than by rigid a-priori sets of categories. Nevertheless, some broad a-priori generalizations are possible for most classes of words. The primary subcategorization of verbs will start with the following schema or one very like it, expressing the possible valency roles of the verb:

SP: Subject – Predicator (simple intransitive): *Hoover died; lexicography lives.*

SPO: Subject – Predicator – Object (simple transitive): *Chomsky killed semantics.*

SPOO: Subject – Predicator – Object – Object (ditransitive): *Fred gave Chloe a baby.*

SPOA: Subject – Predicator – Object – Adjunct (transitive with adjunct): *Fred gave a baby to Chloe.*

SPA: Subject – Predicator – Adjunct (intransitive with adjunct): *Fred leaned on the gate.*

SPC<sub>s</sub>: Subject – Predicator – Subject Complement: *Chloe is a programmer; Chloe looks happy.*

SPC<sub>o</sub>: Subject – Predicator – Object Complement: *Fred made her pregnant; they named the child Ichabod*

More complex schemas are required for a small number of verbs, in particular those that take a clause (in particular, reporting verbs, but also what Dixon (1992) calls ‘secondary verbs’).

Further subcategorization is carried out according to the typical semantic arguments that fill each of the clause roles just outlined. So, for example, a very large number of verbs in English are of pattern SPO: sense distinctions are made by grouping the words that fill the S and O roles into lexical sets according to their semantic type, enabling the lexicographer to distinguish *seizing a cargo* from *seizing someone’s arm*. A fair amount of art is called for in deciding how to group the words into lexical sets: for example, the lexicographer may have to decide whether *seizing a drug smuggler carrying heroin* is more like *seizing a cargo* or more like *seizing someone’s arm*, or whether these should be treated as three separate senses (splitting) or all as just one big, broad sense (lumping).

With this in mind, let us proceed with the analysis of *lean*. It is both a verb and an adjective. The verb is the pivot of the clause. If a word with an unexpected semantic value occurs in a clause, the verb coerces the meaning of

the noun more often than vice versa. Thus, any attempt to interpret an unusual sentence such as *John leaned the sky on the mantelpiece* will typically involve assigning an unusual semantic value to the direct object (*sky*) rather than to the verb. For this reason and others, other things being equal, it is best to start an analysis of a lexical item with verb senses lexicon with verbs.

What is an appropriate semantic frame within which to consider the verb *lean*, and what are the relevant frame elements? A distinction is often made between verbs expressing an action and verbs expressing a state, but in the case of *lean* the distinction is blurred. In 6, for example, it is not clear whether this should be interpreted as a dynamic act of leaning, or a static description.

6. *He leaned on his spade.*

It is important to note that *lean* is not merely intransitive, but that an adjunct (or adverbial), expressing position, is normally obligatory. (There are exceptions to those, in certain jargons, and we shall come to those shortly.) It shares this characteristic with other verbs of position, e.g. *lie*, *sit*, and *stand*.

Levin (1993: p. 112) classifies these as “verbs of putting in a spacial configuration”. Levin’s choice of name for this little group of verbs is infelicitous: “putting” implies transitivity, but *lean*, like *dangle*, *hang*, *perch*, *sit*, and *stand*, is a characteristically intransitive, inchoative verb. Transitive uses are accounted for by the causative alternation that is characteristic of inchoative verbs. It is not clear why Levin includes *lay* as a member of this set.

The case roles (frame elements) involved are comparatively simple:

**Protagonist:** a human agent or a physical object (doing the leaning)

**Theme or Patient:** the thing that gets leaned somewhere

**Position:** the direction of the leaning, including the object leaned on, if any.

Gravity is involved in leaning. The semantic frame invokes the interrelationship of physical objects in a world governed by gravity. The protagonist is typically taller than broad. A low, flat thing does not normally lean, unless stood on its side. If the Protagonist is a human being, and the Theme is that Protagonist’s own body, then the motivation is often to take rest or relief. But it would be stretching analysis to identify motivation as a frame element. The motivation for leaning against something or in a particular direction is, as lexicographers like to say, “any of various”: e.g. to get a better view, to be heard, to reach out and grasp something, to stay on one’s feet in a high wind, or to rest. Or there may be no motivation at all.

The Theme is hardly ever expressed explicitly, for the simple reason that (unless otherwise stated), it is co-referential with the protagonist. You *can* lean a

bicycle against a lamppost, but it more typical for a person to lean [0] against something (intransitive), i.e. to lean their own body against it.

Position, by contrast, is always explicit. It is normally expressed in a prepositional phrase, where the prepositional object denotes a physical object. However, object-free uses are also found. You can lean forwards, or sideways, or westwards, without actually coming into contact with anything.

In short, *lean* is a very intransitive verb, much simpler and less dynamic than *risk*. There is much less going on in leaning than in risking.

### *Exploiting the Norm*

The ways in which the basic sense of this intransitive verb have been exploited are interesting. Three patterns – phrasal verbs – have become established as separate senses in their own right:

7. [[ Person]] lean { on [ ^[ PhysObj]]} (= rely on)

7 says that if a person is leaning on something that is **not** a physical object, the sense is likely to be that they rely on that thing for some purpose, as in 8.

8. The administration was leaning heavily on its argument that ....

Interpretation becomes rather complex when a person is said to be leaning on another person (see 9). This can mean that the person is putting pressure on the other person, as exemplified in 10. However, ‘leaning on someone’ can also mean relying on them.

9. [[ Person]] lean { on [[ Person | Institution]]}

10. ... provide benefits only by leaning on them to pay taxes.

To complicate things still further, it must be noted that a person is both a cognitive being and a physical object. It is quite possible for someone to lean on someone else in the most literal, physical sense, as is the most probable interpretation of 11 and 12.

11. Mothers leaned on children for support ...

12. one woman sobbed, leaning on her husband 's shoulder.

The co-existence of both literal and metaphorical senses of particular phraseological expressions is generally overlooked in dictionaries. If a metaphorical sense is recorded, the fact that the same words can also be interpreted literally is generally left to the reader’s imagination.

This is as a good point as any to remind ourselves that concordances may be a very useful tool for the lexical analyst, but they do violence to meaning in text. Meanings are built up as texts go along. In practice, ambiguity (in the sense of genuine doubt as to which of two possible meanings is intended, of the sort

sometimes observable in a concordance) very rarely arises in real texts: potential ambiguities are already resolved by the co-text before the potentially ambiguous word or phrase is uttered.

A third exploitation of the core meaning of *lean*, verb, is found with the preposition *to* or *towards*, with the sense “be likely to choose or consider choosing”. Again, it is hard to identify the criteria that make us choose one sense rather than another: ‘leaning towards someone’ admits both literal and metaphorical interpretations. Not only has this exploitation become conventionalized in its own right, but also it has given rise to a further exploitation in the jargon of American political journalism, as in 13.

13. Historically, women lean Democratic.

#### *A Variety of Semantic Frames*

All of the minor, somewhat metaphorical senses just illustrated involve a change of semantic frame. ‘Leaning on someone’, when not meant literally, is part of a social interaction frame in at least two places: with verbs of persuasion and with verbs of dependency. The corpus analyst makes these judgements on a probabilistic basis on the grounds of clues in the immediate co-text. A cluster of clues may add up to a virtual certainty, but they can never add up to a necessary condition for selecting a particular sense. Note, too, how rare these metaphorical exploitations are compared with the overwhelming frequency of the basic, physical, literal verb sense. It would be entirely reasonable to say that the verb *lean* has only one basic sense, which is exploited both grammatically and metaphorically in various ways in different frames. Postulating four or five independent senses, as large traditional dictionaries do, is merely misleading.

#### *The problem of verbal nouns (and verbal adjectives)*

Neglected but pervasive problems are posed by *-ing* forms in English. In some cases it is impossible to say whether these are verbs, nouns, or adjectives. For example, in 14, the word *making* is governed by a preposition (*for*), which implies that it must be a noun; but on the other hand it governs a direct object (*beer*), which means that it must be a verb.

14. The apparatus needed for making beer.

- 14a. The apparatus needed for beer making.

14a is no less grammatically well formed than 14, but much more nouny. Here *beer*, which is logically the direct object of the verb *to make*, is placed as a noun modifier before the verbal noun *making*. It may be argued that 14 and 14a are examples of a problem that may trouble text analysts but not lexicographers. These examples do not constitute a case for adding *making*, noun, as a

dictionary entry. However, before heaving a sigh a relief and deciding that they can safely ignore the problem of *-ing* forms, lexicographers should note that such global policy decisions have been responsible for some very poor lexicographical practice. The fact that the noun *breeding* (“the good manners regarded as characteristic of the aristocracy and conferred by heredity” – NODE) is derived as an *-ing* form from the verb *breed* does not obviate the need to give it a separate entry in a dictionary. On the other hand, it is less clear the same word in the sense “the mating and production of offspring by animals” needs to be entered in a dictionary. And placing the “good manners” sense as a semantic derivative of the “reproduction” sense is not defensible.

The expression *breeding ground* was systematically overlooked in standard English dictionaries for many years, presumably on the flawed argument that, because *breeding* in this expression can be analysed as a verbal adjective modifying *ground*, it is part of the grammar, not part of the lexicon. But the semantic connection between the two elements is not easily inferred from normal rules of syntax. The syntax is clear, but the meaning is opaque.

To take another example more at less at random, it is not clear why Cobuild records *handling* as a verbal noun derivative of *handle* in the transitive sense (“*the military’s handling of Robert’s death*”), but not in the inchoative sense (“*the car’s handling is beautiful*”). NODE’s decision to omit all reference to the verbal noun *handling* is even more surprising. In fact, problems presented by *-ing* forms are pervasive in the English lexicon. A reappraisal of lexicographic policy with regard to *-ing* forms, in the light of corpus evidence and users’ needs, is overdue.

In the case of *lean*, the verbal noun is usually plural (*leanings*). Neither the form nor the meaning are predictable on the basis of the verb, so this is a lexicographical no-brainer. *Leanings* (plural) belongs in any self-respecting dictionary of English.

#### *Analysing Adjective Senses*

Next in line are adjective uses. In some linguistic analyses, adjectives are regarded as transformed versions of verbs, and in certain languages the verblike quality of adjectives is more obvious than it is in English. The approach to the analysis of adjectives can be very similar to that of verbs. An attributive adjective typically has a valency of one, i.e. its meaning is analysed in relation to the head noun that it modifies.

Predicative adjectives, on the other hand, are more like verbs. For example, *glad* is typically predicative, followed by a *that*-clause (*she was glad that he had*

told her), a conditional clause (*I shall be glad if you could help*), a to-infinitive (*she was glad to hear it*), or a prepositional phrase (*she was glad about what had happened*). As in the case of verbs, a lexicographer doing corpus analysis must decide whether these different complementations should be grouped together, as all expressing basically the same meaning of *glad*, or whether some semantic difference can be attached to the different syntactic patterns. In the case of *glad*, grouping seems appropriate. There is only one sense of *glad*.

However, one very particular pattern is worth noting separately used for a particular **pragmatic** purpose. A first-person declarative sentence in which *glad* is governed by a verb phrase containing the modal *shall*, *will*, *should*, or *would* plus the verb *be* (e.g. *I would be glad to contribute*) expresses an offer to do something for the benefit of someone else. Formally, it could be analysed as a prediction about a condition that would bring about the speaker's future happiness, but of course that misses the point of the utterance. As we have already noted, conventional pragmatics of this kind were neglected in traditional lexicography.

#### *The Adjective lean*

Returning to our analysis of *lean*, we come to an example of another of lexicography's pervasive and recurring problems. Is the distinction between *lean meat* and *lean muscle* in Appendix 1 justified? A fair amount of variation is possible in the level of detail in any analysis, and choices will be determined by the intended application. There is a constant danger of overinterpretation, i.e. of importing subcategorization distinctions into the syntax on the basis of the interpreter's own beliefs. With these caveats in mind, the reader might argue that, after all, meat is muscle. But then, if we are not distinguishing the sense of *lean* in *lean meat* from its sense in *lean muscle*, is it worth making a distinction between *lean muscles*, *a lean body* (containing lean muscles, presumably), and *a lean person* (i.e. one having a lean body)? Here we have run into examples of what Apresjan (1973) calls 'regular polysemy'. Adjectives denoting physical characteristics of a body part are regularly applied also to a person having such a body part. Likewise, adjectives denoting abstract qualities are applied equally to behaviour and to people or animals exhibiting such behaviour: *a courageous act*, *a courageous person*; *a ferocious attack*, *a ferocious dog*.

The semantic frame of an adjective is determined by the head noun whose meaning it modifies. The adjective *lean* modifies an interesting variety of head nouns. How to group the head nouns modified by *lean*? There is a continuum



from *lean meat* through *lean muscle* to *lean limbs, a lean person or animal*, and then a metaphorical leap to *lean businesses* and *lean years*.

In all but the last of these, *lean* is used with positive connotations. Lean meat is good, lean muscle is good, and a long lean look has been fashionable for decades. Only lean years are bad, and that expression is of biblical origin. Even the bad adjective *mean* acquires positive connotations when associated with *lean* in the cliché *lean and mean*, which is identified as a desirable goal for businesses and public institutions.

The use of *lean* as a term of approval makes it a particularly ready candidate for metaphorical exploitation. We find not only regular alternations (e.g. *lean muscles, lean limbs, lean people*) but also irregular exploitations (*lean songs, lean clothes, a lean trade fair*). The lexicographer has to decide which of these expressions are normal and conventional (and therefore candidates for dictionary entry) and which are exploitations of the norm, ignorable for lexicographical purposes.

#### *Noun Forms Associated with lean*

Before leaving *lean*, we turn to some problematic noun forms. Is *lean* itself a noun? And what about derivatives? The orthographic type *leaner* in most cases lemmatizes as the comparative form adjective. However, there is one line, 15, in which it is clearly being used as a noun.

15. I became a wearer of double-breasted suits, a leaner on bars, a discussor of interest rates.

It would be a lexicographical error to treat this single occurrence as sufficient evidence for the existence of an English noun: "*leaner*: one who leans". The correct analysis is that this is an agent nominalization of the verb *lean*: an ad-hoc product of a grammatical rule, not an item in the conventional vocabulary. The same goes for *discusser* and *wearer* in the same citation. This guideline is, however, only a guideline. The distinction between products of a grammatical rule and lexically distinct conventional vocabulary items is necessarily fuzzy. Indeed, it is not only fuzzy, but also constantly moving. Yesterday's exploitation may be tomorrow's norm. Different lexicographers will draw the line in different places, but it is important that all members of a lexicographic should observe team discipline and try to draw it in roughly the same place. With this in mind, it is surprising to see that "*leaker*: someone who lets people know secret information" has been added to the third edition of Cobuild, a dictionary that used to pride itself on the judicious selection of entry words.

The *Shorter Oxford English Dictionary* (NSOED) is much larger than Cobuild. It contains a sense of *lean*, *noun*: “the act or condition of leaning; inclination”. Leaving aside the rather curious use of the word ‘inclination’ in the definiens, the question arises whether this sense belongs in a general dictionary at all. On the one hand, it is entirely predictable according to the rules of English word formation: any action verb can be used as a noun. (A piece of anecdotal evidence: the question “Did you have a good read last night?” prompted the answer, “No, but I had a good write.”) If leaning is an action, then a noun *lean* is inevitable. But on the other hand, the very fact that it is predictable constitutes an argument against including it in a general dictionary, in the absence of further evidence. If found, it may be regarded as an exploitation of the verb, rather than as part of the lexicon in its own right. Its inclusion in NSOED is justified by four examples in OED:

1776 G. Semple, *Building in Water*. Pressure from either side would give them a lean to the other side. 1850 P. Cunningham, *Handbk Lond*. Leaden coffins piled thirty feet high, and all on the lean from their own weight. 1851 *Jrnl R. Agric. Soc*. The corn has a decided lean in one direction. 1890 Clark Russell *Ocean Trag*. The rounds of her canvas whitened into marble hardness with the yearen and lean of the distended cloths.

This evidence may be considered conclusive, which is no doubt why so many general dictionaries have followed OED in including it. But before joining the throng, a lexicographer working on a general dictionary of modern English might think twice. There is something slightly odd about at least two of the four OED citations. For the compiler of a modern lexicon of English, the real question is whether *lean* is so well attested as a noun in modern English texts that it must be recorded as part of the vocabulary of general, conventional English. It does not occur in our 500-line sample. But we must also beware of the “failure-to-find” fallacy. The fact that we have failed to find something in a sample does not mean that it does not exist. So to resolve our dilemma we must widen the search. Widening the search takes two forms: if we want to make a decision with confidence, first we must forage beyond our sample and skim through all 2164 corpus lines for *lean* and all 411 for *leans*. Secondly, we must be prepared to consider traditionally collected citation evidence, which tends to focus on rare and unusual uses.

For the corpus-based *New Oxford Dictionary of English* (NODE), the clincher that decided the lexicographer to include this sense was a citation from *Know Your Land Rover*, by Robert Ivins (1991):

16. The vehicle has a definite lean to the left.

The conclusion of this detailed discussion of the lexicographical dilemma whether to include borderline senses such as *lean*, *noun*, “the act or condition of leaning” is that it really *is* a borderline case. Lexicographers compiling a modern dictionary should protect themselves against a natural predisposition to be overwhelmed by OED’s sometimes overwhelming historical evidence, and think. Modern corpora may provide enough evidence to offset OED’s collection of old citations, illuminating though those may be for purposes of understanding the history and development of a word. The wise lexicographer will resist the temptation to include such cases unless overwhelmed by evidence of present-day usage. (‘Overwhelming evidence’, be it noted, may consist of no more than a handful of textually well-formed and convincing modern uses.)

The problem of sparse data is a constant one in lexicography, and calls for policy decisions which, in practice, are rarely discussed explicitly. Is the policy of the dictionary to record all imaginable words? That seems like a recipe for disaster, and yet it seems to be the policy attempted by some dictionaries, for example in their choice of undefined run-on entries. Or should it be all words ever found? But, as we have already seen, large corpora contain many, many examples of creative coinages that can hardly be regarded as an established part of the language. All words used by two or more independent authors? All words in conventional usage? If the latter, by what definition of conventional? There is no single correct answer to these questions, but it behoves dictionary makers to think about them and to make policies explicit.

A final remark before we leave “the act or condition of leaning; inclination”. Earlier, I questioned the inclusion of “inclination” as part of SOED’s definition. The normal meaning of *inclination* in modern English has nothing to do with *leaning*. Having written a satisfactory explanation or definition, the lexicographer should leave it at that, resisting the temptation to have another go at it – though in present-day English dictionaries this guideline is more often breached than observed. Anna Wierzbicka, for one, has argued strenuously (e.g. 1993: p.48) in favour of saying what you have to say and then shutting up:

There is no need to add anything; the simple short definition is okay; on the contrary, it is the longer one that is faulty, because, as Aristotle pointed out 25 centuries ago, in a definition every superfluous word is a serious transgression.

#### *Names in corpora*

The base form *Lean* occurs not only as a word but also as a name. Human beings recognize names in text with little difficulty, and for this and other

reasons, many dictionaries do not include names at all. Others offer a selection of names of famous people and places, with short identifying descriptions, as part of the cultural heritage of a language, or (in the case of bilingual dictionaries) in order to give translation forms of a name where the forms are different in the two languages. No dictionaries attempt to list all the conventional surnames and place names known to a language, let alone business names and product names. The dictionary would be completely swamped with useless information – useless, that is, for human users.

However, for a computer program processing text, it is a nontrivial task to distinguish proper names from vocabulary words in text, and to know whether a name is a place name, a personal name, or a business name. And for applications such as speech generation and speech recognition, a lookup table of phonemic transcriptions of names can be invaluable. Some lexical database developers now report that over 80% of the items in their databases are proper names, and the percentage is growing. Because names are more or less conventional but do not have a meaning like other words, there can be no more dramatic illustration of the need for lexicography in the age of the Internet to be application-driven. The decision whether or not to collect and store names is determined by the application. And if names are collected, what is said about them is likewise determined by the needs of the application.

In printed texts proper names are usually marked by an initial capital letter. However, this distinction is not reliably observed on the Internet or in email correspondence and is of course completely absent in speech. Corpus-based lexicography designed to support text processing now recognizes named entity recognition as an important part of the task of text analysis. When all the place names and all the personal names in the world have been added to the computational lexicon (always allowing for the fact that new ones are generated from time to time), lexical inventors will need to turn their attention to names of business corporations, brands, and products. Names of brands and products are a particularly rich source of new vocabulary.

At this point, common sense intervenes and says, “You don’t need to know very much about a name. Wouldn’t it be better to generate the relevant information as part of text processing, rather than storing it in a database?” To do this successfully in a powerful general-purpose natural-language processing system, we would need at least to have procedures for determining that a term is a name of a certain kind, fulfilling a particular semantic role. These procedures would determine information of the following kinds:

- a) Is it a place name, a personal name, or a business name?
- b) If it's a place name, where is the place, and what class of place is it (e.g. country, city, mountain, river, street)?
- c) If it's a personal name, does it contain information about the ethnicity and/or gender of the bearer? Is it the name of a famous person, and if so what is he or she famous for? If we encounter the expression *David Lean* in text, how do we know that it denotes the film director and not some other citizen?
- d) If it's a business name, is it the name of a firm, or a brand or product?
- e) If it's the name of a brand or product, what's it for? (E.g., can you eat it, or do you use it to cut holes in metal?)

These are the main broad categories about names, but of course there are a myriad other subcategories of information about names that can be of great importance, constituting a database of conventional shared knowledge. For example, if the answer under (c) is "He is famous for making films," we might add supplementary questions such as "What films did he make?" Thus, the lexicon that includes names becomes not merely a list of vocabulary words, but also a collective cultural index.

As it happens, only three of the uses of *Lean* in our sample are proper names. To understand one of them, it is necessary to know that David Lean is a film director. This information may be available from a standard encyclopedic dictionary, which would be less likely to include anything about *Lin Lean Lim* or *Gangsta Lean*. In computational text processing, the identification of such strings as proper names in general texts is likely to be dependent on coercion from the local context for many years to come. On the other hand, *Gangsta Lean* is already stored in many Rappers' databases, available through on-line resources. (At the time of writing, *Gangsta Lean* gets 4570 hits on Google.)

To summarize, therefore: it seems desirable to use the enormous power of computers to coerce named entity recognition dynamically, but also to use names as pegs on which to hang attributes and values for as many names as possible in a hierarchically organized knowledge representation system. Here the role of the lexicographer merges into that of a traffic manager.

### *Case Study 2: How to tell a fish tank from a battle tank*

The title of this case study is a tribute to Mike Lesk's influential paper (1986), 'How to tell a pine cone from an ice-cream cone'. The lemma *lean* has very few noun uses, so to study the mapping of the meanings of nouns onto their uses, we must look elsewhere. The word chosen for illustrative analysis is *tank* (noun senses only).

The first point to notice is that quite different techniques are required for the analysis of noun senses and verb senses. Verbs and adjectives, on the whole, respond well to syntagmatic analysis, and this is also true of nominalized forms of verbs such as *distribution*, which has the same argument structure, mutatis mutandis, as the verb *distribute*.

*Tank*, however, is not a nominalization. It is one of many referring expressions, which refer to physical objects in the world around us. In fact, it refers to at least two classes of material object: 1) a type of military armoured vehicle ; 2) any of various types of storage containers for liquid or gas. It is obvious enough to a human that an armoured vehicle is quite different from a storage container. The task for the computational lexicographer is to provide explicit clues to help an NLP (natural language processing) program make the same distinction, and to compute the implications accordingly.

The relevant clues for noun meanings are different in kind from those that indicate the relevant sense of the verb and adjective. Some of the clues (in italics and underlined in Appendix II) are indeed in a syntagmatic relationship with the target word, for example verbs of motion such as *rolled* and *rumbled*. Others (in italics but not underlined) are in a freer relation with the target word: they are what J. R. Firth called “collocations” as opposed to “colligations”.

Typical colligations of the military vehicle sense of *tank* include:

- subject of a verb of motion: e.g. roll, rumble, break through, drive over
- subject of a privative verb of motion: e.g. be stuck, abandon
- subject or object of a military destruction verb: e.g. fire at | on, strike at, destroy, bombard
- modification by a cardinal number (military analysts like to count the number of items in a force available to a commander)
- modification by a term denoting a nation or other military power (e.g. the U.N.)
- modification by one of a specific set of brand names, e.g. *Leopard*, *M1*, *Merkava*, *T-72*
- modifying terms denoting military units such as *squadron*, *division*, *force*.

Typical free collocations of *tank* in this sense include:

- *infantry combat vehicles*, *armoured fighting vehicles*, *armoured personnel carriers*, *warplanes*, *planes*, *ships*, *aircraft carriers*, *submarines*
- *artillery*, *mortars*, *weapons*, *machine guns*, *ammunition*
- *bombard*, *mortar fire*, *heavy shelling*
- *army*, *troops*, *soldiers*, *force (noun)*, *general (noun)*, *enemy*, *rebels*
- *battle*, *maneuvers*, *manoeuvres*

- *camouflage*
- *headquarters*

(Terms that are typically colligations may also occur in the co-text as free collocations: for example, someone else, not the tank, may be doing the firing.)

Expressions such as these provide clues (not certainties) that the kind of tank in question is a military vehicle, not a habitat for fish or a storage container for fuel. The effect is cumulative and probabilistic, not digital and deterministic. It is perfectly possible to *strike at* and *destroy two hundred heavily camouflaged fish tanks* with *artillery fire*. But less likely. With each additional clue, the likelihood of a particular interpretation increases. And when ordinary people read ordinary texts in an ordinary, linear fashion, expectations are pre-set from the outset. Indeed, they are set by the domain before the reader reads even the first word of a text: the very act of picking up a sports magazine engenders certain expectations about what kind of things will be said in it.

Texts containing *tank* in its military sense are particularly rich in both collocational and colligational clues. By contrast, clues for the container sense of *tank* are rather sparse. The colligational clues consist mostly of a pronominal modifier:

- *Fuel tank, water tank, storage tank, ballast tank, oil tank, gas tank, etc.*

The density of collocational and colligational clues seems to correlate with the specificity of meaning. The military vehicle meaning is more specific than the container sense.

Free collocational clues in the latter sense include names of species of fish, in particular exotic aquarium fish. This brings us to another question: is a *fish tank* the same sense of *tank* as *fuel tank*? At a very general level, both are containers, but they are used in very different semantic frames. There is no single “right” way of dividing up the different uses of this term. If we separate fuel tanks from fish tanks, should we go on to distinguish the small fuel tanks on a vehicle from the vast storage tanks in which fuel is stored in bulk? Does the term *fuel tank* have two senses? The answer to this and similar questions will be determined by the application (the kind of dictionary being compiled, its intended use, the space available), not by anything in the language. Finding the right level of generalization is an essential part of the lexicographic task.

A term with a very broad meaning, such as *tank*, has a wide variety of uses in different contexts, and lends itself to the coinage of multiword expressions, both as modifier and head, some of the resultant terms having specialist meanings:

- *Towing tank, breeding tank, single species tank, flotation tank, greenhouse tank, septic tank, think tank*
- *Tank engine, tank car, tank barge, tank cutter*

Again, the decision about which of these to define in a dictionary will be determined by the application. Traditionally, lexicographers have, quite rightly, favoured entering multiword expressions whose meaning cannot be easily deduced from the parts. Thus, a **breeding tank** is a tank for breeding something in (as it happens, fish); a **flotation tank** is a tank for floating something in; a **greenhouse tank** is a tank in a greenhouse. These terms can, perhaps, be safely left out of the dictionary. The term **fuel tank** is one of the most common N+N combinations, but entering it in a dictionary would be silly. Who would benefit? It would entail disregarding the most basic type of modifier-head semantic relation, while opening the floodgates for an unlimited number of other noun phrases in which the term denoting the thing contained modifies a head noun denoting the type of container. Frequency is not a good criterion for dictionary entry of N+N combinations. On the other hand, it is a very good criterion for indicating typical syntagmatic behaviour of compounding nouns, especially if accompanied by a specification of the type of semantic relation(s) involved. Dictionaries might at least indicate typical modifier+head relations for certain noun entries such as **tank**. Among the monolingual English dictionaries, only *Collins English Dictionary* (CED) attempts to do this, and it is constrained by the fact that it is not corpus-based (despite occasional imaginative claims to the contrary by its publisher).

On the other hand, terms such as **septic tank**, **think tank**, **tank engine**, and **tank top** are opaque without some kind of explanation, and are therefore good candidates for dictionary entry.

It is a slow and time-consuming business, wading through corpus evidence looking for significant evidence, especially as, ideally, the whole corpus will be searched, not just a small random sample. A lexicographical shortcut for corpus analysis, particularly useful for the analysis of nouns of this kind, is the statistical test (mutual information) described in Church and Hanks (1989, 1990). Table 1 shows the words most associated with all occurrences (10,547 – far more than even the most dedicated lexicographer could read through) of the term **tank(s)** in the entire AP corpus for 1992-96. Mutual information (MI) selects associations on the basis of statistical significance, not mere frequency. The lexicographer can use a table like this to begin the task of sorting out the different semantic frames and senses.



Table 1: MI scores for words most associated with 'tank(s)' in AP 1992-96.

Associated word <i>x</i>	MI score of <i>tank(s) + x</i>	Co-occurrences of <i>tank(s) + x</i>	Total occurrences of <i>x</i> in the corpus
30,000-gallon	10.75	12	13
t-55	10.67	38	39
t-82	10.64	6	6
t-72	10.64	64	64
M1-a1	10.64	21	21
67-ton	10.64	7	7
400-gallon	10.64	7	7
1,500-gallon	10.64	6	6
Merkava	10.58	24	23
side-mounted	10.54	30	28
t-80	10.53	14	13
sidesaddle	10.43	61	53
t-54	10.37	12	10
20-gallon	10.22	8	6
pressurizing	10.12	10	7
M1-a2	10.11	13	9
septic	10.03	106	68
70-ton	9.98	11	7
m-1	9.83	107	61
761st	9.36	17	7
Pressurize	9.28	23	9
m-60	9.21	51	19
Briarcliff	9.05	18	6
million-gallon	8.90	20	6
propane	8.89	386	115
overfilled	8.70	23	6
rocket-launchers	8.64	36	9
Treads	8.40	52	11
ballast	8.31	90	18
self-propelled	8.26	52	10
howitzer	8.22	203	38
howitzers	8.18	296	54
turret	8.15	45	8
transporters	8.13	34	6
155mm	7.98	151	24
punctured	7.96	250	39
turrets	7.95	45	7
ruptured	7.76	552	75
armored	7.75	4016	544
Leopard	7.65	166	21
rumbled	7.52	383	44

[Footnote: Thanks are due to Richard Sproat of AT&T Bell Laboratories for help with the table.]

Other statistical tests are in use in lexicography, in particular t-score. T-score favours high-frequency function words, so is especially useful to EFL lexicographers in compiling dictionaries showing the natural colligational phraseology associated with a target word. MI favours the less common content words, and so is particularly useful in identifying free collocations.

## **Conclusion**

This paper has presented the main points of corpus analysis for lexicographical purposes of content words: verbs, adjectives, and nouns. It shows how the corpus analyst can take the syntagmatic structure of a word and relate it to the meaning or semantic structure.

It suggests that several aspects of traditional lexicography, including pragmatics, function words, *-ing* forms, treatment of names, multi-word expressions, and sense distinctions, can benefit from recent developments in cognitive linguistics, corpus linguistics, and frame semantics. It offers a reminder that lexicographers have to make choices and suggests that the better informed they are in these areas, the better the choices they will make.

It proposes that for verbs and adjectives at least, syntagmatics, rather than (or rather, in tandem with) perceived meaning, should be the organizing principle of the dictionary entry. A similar, but slightly more complicated case, is made for the organization of nouns: different kinds of nouns require different kinds of treatment. For referring expressions in particular, any syntagmatic arrangement needs to be supported by classification of the statistically significant collocations found in the immediate environment of the word being analysed.

Syntagmatic relations in texts are observable, measurable, and testable. Perceived meaning is private and depends on the private beliefs of the perceiver. If perceived meaning is the organizing principle of a dictionary, examples can often be found to illustrate the perceptions of the writer, but that does not mean that the writer has achieved an appropriate level of generalization.

Syntagmatic arrangement does not obviate the need for lexicographic art and judgement in the arrangement of entries. Decisions still have to be made about how to group uses, how to word definitions, and what to leave out. But syntagmatics requires working with palpable material, which can be measured and objectively evaluated, as distinct from the unsubstantiated assertions of introspection and ad-hoc reactions to isolated citations.

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## APPENDIX I: Corpus sample: lean\*

### NAME

other good purchase. One of David Lean 's timeless epics, it speaks of  
 everly(Warner Bros. 20. " Gangsta Lean " DRS(Capitol " Platinum)< MODE  
 document made public Monday. Lin Lean Lim, the paper 's author, said

VERB 1, S P A: [[ PERSON]] lean [ ADJUNCT[ Position | Direction]]  
 ealized. Over the sea bass, Angus leaned across the white linen tablec  
 e rickshaws moved together and he leaned across and punched his brothe  
 was nothing lazy about the way he leaned across the table towards her.  
 thing, could n't it " Dangerfield leaned across and whispered, with th  
 go away. Jessica, seat belt off, leaned across Rory 's chest, drove h  
 e made a move to open her door he leant across and slammed it shut. Wh  
 ght to my heart; I should like to lean against that tree between the o  
 t I have made it " He had come to lean against the foot of the baniste  
 leaned against the wall, arms folded  
 ifted his collar philosophically, leaned against the hardier Theatre b  
 xactly a week from now. And as he leaned against the railings he sudde  
 r word. Trembling with shock, she leaned against a sundial and re-ran  
 loose-box and, coming out again, leaned against the closed door with  
 er he took a very deep breath and leaned against a wall. He had been o

y, he put his arm around her. She leaned against him comfortably, and m. She curled up on the floor and leaned against the arm of Morris 's ok up at her reproachfully as she leaned against the doorpost dabbing breath. Halfway down she stopped, leaned against the rungs, and heaved ures standing far on the edge. He leaned against the hot metal of his is jeans were heavy with zips. He leaned against the doorframe, a lean thoughtful look on his face as he leaned against the doorway and watch was carrying Carolyn 's suitcase, leaned against a door to hold it ope Motor Cycle News, opened it out, leaned against the wall of the lobby gulfed her. Closing her eyes, she leaned against him weakly, her whole et of the Peugeot was cold as she leaned against it trembling. It was ht bands round the calves. He was leaning against the rail smoking a c but compact and muscular. She sat leaning against the white-painted wa " Joe 's voice was low and husky. Leaning against the desk he watched dark little girl who was herself leaning against a lifeboat. She was d into the hallway, he saw Singer leaning against the door of his room id n't race away past me. I stood leaning against the tall coconut pal lowed him into the garden. He was leaning against the parapet rail, ga reflected by the glass. Luke was leaning against the bar as she went sby instructed us to take a bench leaning against the far wall and, th I " Miss Florence and Miss Belle leant against each other, and Miss R e young Carlo groaned wearily and leant against a wall in confirmation re, Mrs Sutherland " Leon Kennedy leant against the door to shut it an ource of action. He pulled up and leant against a tree. His panting so ld not remember moving to it. She leant against him, their nipples tou s old as 30 and carry weapons. We lean against the walls and windows a er brief court appearance, Hughes leaned against the prisoner 's box a ed dejectedly from the courtroom. Leaning against a wall, watching, wa opy. Thank You. Key visuals: Bush leaning against his desk, speaking i rise on a street next to a rodeo. Leaning against bales of hay as he d tail of 6-year-old Ilana Kattan. Leaning against the president 's des lly " said soldier Alair Buyumye, leaning against one of the buses use for mostly minor injuries. People leaning against a metal fence and a er in a tight tank top and jeans, leaning against a ladder; it did not de deux, not sentimental. One man leans against the other in confidenc om. His 10-year-old son, Randall, leans against him, looking at his mo recall if I stood on the street, leaned all the way in and reached ov rom the wall against which he was leaning and staggered out onto the s arble facade today. Charred beams leaned at crazy angles against the i ahead impassively or looked down, leaning away from the defense table t intoxicated, he thought, as she leaned away from him, pulling the dr ogation and criticism, government leans away from democracy towards au just bounce out of control as you lean back. You need to sheet out con f passing seconds. Making herself lean back into her walk as though sh road steppe of her Slavic soul. I lean back in my seat, smiling ironic held their drinks in mid-air. She leaned back against the seat, her ha as thinking " Susan broke off and leaned back, looking so tired that B he armchair, and lit his pipe. He leaned back puffing at it wondering s by now hot with frustration. He leaned back on his heels and looked ork a few evenings for me " Lewis leaned back in his chair as his moth her arms to hold her breasts. She leaned back against him, covering hi s a mistake. He tensed again. She leaned back against the wall and sai that he was behind it " Alexander leaned back against the cushions. I Then, before she could answer, he leaned back in his chair and dropped ook his head. Then he shifted and leaned back against the back of the eve admitted reluctantly and then leaned back to let the waiter pour t last the hospitaller finished and leaned back on his heels though he k er " and " Burlington Bertie " He leaned back in his chair and thrust ders there in 1985, I found Walid leaning back in an old wooden chair

d fiercely. Then, standing up and leaning back into the shadow, she fl  
elf over the canoe 's side; first leaning back with legs outstretched  
executed quickly. Do not hold the leaning back position. The Jack Knif  
airs, and I gave her a cigarette. Leaning back her head she blew out a  
re was a man in the driving seat, leaning back against the head-rest,  
. There " You see " It 's awful " Leaning back against the wall, her a  
" Of course " he agreed smoothly, leaning back in the chair to stretch  
r the last five years " he asked, leaning back in his chair and lookin  
trong hands behind his dark head, leaning back, watching her through h  
's slimmed down and laid back. He leans back, crosses his legs, and lo  
ame is played. As they answer she leans back, and her nightdress brush  
he guard stands by the door. Bill leans back against the bed by John '  
luggage. She folded her arms and leant back against the rail, watchin  
rom the paperwork on his desk and leant back in the chair, a lazy grin  
e " Ain't fair, eh " Aldo Isidori leaned back in his seat at Toronto '  
, put his fist to his mouth, then leaned back in dejection against a c  
Hall. I had his chair, too, but I leaned back in it one day and nearly  
w hours into Atlanta from Madrid, leaned back, shut her eyes and once  
was behind it, my kids " he said, leaning back in a used reclining off  
the number and shape of debates. Leaning back in the front row of his  
the horn of the saddle, Joel Berg leans back and gives a celebratory "  
day to night " Guy Sterne came to lean beside her, clad now in worn-lo  
sler, who wouldn't say how he was leaning but usually follows his advi  
e music and eyed a handsome youth leaning by himself against the bar.  
distance, shows Charles and Diana leaning close together, as if for ki  
. When it stopped, Delaney had to lean closer as Forster 's voice drop  
Russians " I nodded. The bald man leaned closer and spoke very quietly  
drove her from Scotland " Agrippa leaned closer and I smelt that stran  
anging her mind, she turned back, leaning closer to Karr. And if it is  
to St Paul 's and found Ralemborg leaning despondently against a pilla  
o great effect in England, was to lean down from the dais to tell a hu  
what happened, but they seemed to lean down and grab us, just pull us  
ain. But why must you go out " He leaned down on the table, a hollow-f  
ave we here " their father asked, leaning down and picking up the pape  
he got a steel knee on top of it. Leaning down, she took its head betw  
arder at controlling himself. She leant down and started to lick out h  
Brown Simpson 's mother, Juditha, leaned down and kissed Simpson 's fr  
er octaves. Graffman, twisted and leaning far to his right, will use h  
three sides in a broad loop. She leaned for a few minutes on the ston  
ecrecy and privacy, was forced to lean forward in a kind of pseudo-int  
nd complains of a slight ache you lean forward solicitously and ask "  
Raise your knee to chest height. Lean forward and place your opposite  
began Henry. Yes " The policeman leaned forward. It does seem almost  
d a cracked skull and " The Woman leaned forward further and punched h  
f deceitfulness. Miss Thorne " he leaned forward, no longer good-humou  
ed in a soft, concerned voice. He leaned forward over the steering whe  
r before. What 's up mate " Billy leaned forward " d' you know her " T  
a surprise " The pale golden head leaned forward towards the grey and  
ormation in very particularly. He leaned forward with a sudden movemen  
" The voice paused again. Manescu leaned forward, tried to get some im  
e asked again. The prince at last leaned forward, on the verge, we ass  
ake a bowl with us " Li Shai Tung leaned forward, offering the boy the  
and made him put it on again. He leaned forward as if he meant to kis  
Chang moved back from Chen, then leaned forward again, placing the st  
he river with great intensity; he leaned forward a little, as though t  
e old man was smiling. Tuan Ti Fo leaned forward, beginning to clear t  
I fear for her mental health " He leaned forward and took her hands in  
" and then, drawn inexorably, she leaned forward across the table and  
on of yours " Indeed I was " Vass leaned forward in his seat, reached

e, and as he got into her car she leaned forward and kissed his cheek  
y, what is the matter " My master leaned forward and in curt, clear to  
t the beginning of the book " She leaned forward, hands clenched on he  
d the table. Every time one of us leaned forward for the salt the flam  
y " Her hands were shaking as she leaned forward to lift the cup to he  
es, I see what you mean " Lindsey leaned forward, her fingers gently p  
at home " He frowned slightly and leaned forward. She shook her head.  
something in her sleep. Caroline leaned forward and took her hand. An  
stination you were bound for " He leaned forward to take her hand. No  
yes alight with enthusiasm as she leaned forward. Then when I saw you  
inting back into the box. Charlie leaned forward and stared down in di  
She was sitting on a grassy bank, leaning forward a little, a cigarett  
once the idea had come to him of leaning forward and judiciously stub  
he police at any moment. Ward was leaning forward again, his weight dr  
esemble hers. Graham felt himself leaning forward, wanting to catch he  
now is information " he told her, leaning forward across the desk to m  
he would know the woman was still leaning forward, great uncouth lump,  
I 'd really like " she breathes, leaning forward, her eyes shooting s  
g 's come off " he says again. He leans forward and picks up one of hi  
g to have an hour together " Anya leans forward and adds more coal to  
By the Spitfire, was n't it " He leant forward and the helmet fell ov  
e on to the field. Wait " Perdita leant forward and removed a piece of  
Seizing her opportunity, Margaret leant forward across her desk and wh  
g " I suppose so. Besides " Derek leant forward and lowered his voice.  
nodded in mock amazement. Taczek leant forward and lowered his voice  
hisked against the glass. Blanche leant forward on her chair, her eyes  
ence suffered in her youth as she leant forward, anxious to replace he  
did n't tell them the truth " He leant forward, resting his hands on  
ests dressed in 1920s chic. Walls lean forward at various angles; none  
ul " and " Marinette " Later, she leaned forward in her wheelchair and  
t half took notes, and often they leaned forward to get a better look  
hink I am going going to win " He leaned forward, and then he stood up  
sby Center " with the late singer leaning forward over a set of golf c  
an be misunderstood " Leary says, leaning forward, his blue eyes wild  
Over a last cup of coffee, Echols leans forward to confide " My son di  
to write about " He perks up and leans forward again. And the struggl  
weight on the centreline. 3. Not leaning forwards as you rise. 4. Not  
er, as he left the courtroom, she leaned from her seat and hissed in a  
clared 58-year-old Musrata Sabic, leaning from her balcony for a bette  
th to work is knee to waist deep. Leaning hard on his net to counterac  
leaning heavily on her arm; the man leans heavily on its " support " If  
n and where a wind-blown standard leans heavily on his staff, rested  
um, he looked drawn and tired. He leaned heavily against his crucifix-  
her umbrella as a walking stick, leaning heavily on it and taking sma  
oom. Silas turned to where Doreen leaned in a crouched position agains  
school at which I was CFI taught leaning in Exercise 4 and throughout  
. His wife was on the same jury " leaning in the opposite direction. A  
tain half drawn across it. Deuce leaned into the bath with a curtain  
. Then, taking a gulp of air, she leaned into the car and pressed his  
nk employee noticed a potted tree leaning into a hole in the sidewalk.  
, his most abundant commodity. He leans into the bars of his cell, an  
are we waiting " The driver stood leaning negligently against a front  
t it, imagined how it might be to lean on one elbow, to twist her body  
refuge but a friendly shoulder to lean on and a sympathetic ear. The k  
imping slightly and she paused to lean on the girl with the blonde cur  
to walk across the court, or she leaned on the arm of the nearest gra  
in there " he commented. Tabitha leaned on the door. It would n't bud  
aughter of the Establishment, she leaned on the sill, watching the goi

door opened and a guy got out and leaned on it. All right, what gives n a while " Francis said. The man leaned on the topmost rung of the pi d the castle 's steep rampart. We leaned on the railing, and peered do He did n't say anything else. He leaned on his spade and looked at Ol do we get up there " Beth asked, leaning on her elbows in the sand. I ddling up to the Liberals is like leaning on candy floss " Mr Kinnock, I hope " you do n't mind a man " leaning on you " he asked with an in turned to advantage " Lachlan was leaning on the battlements, watching rned to come back for me. I stood leaning on the staff, grinning and t striped breeches and greasy caps leaning on the wooden railings, othe y round the piazza, the Brigadier leaning on the horn to make a path t hey are placed, either hung up or leaning on the ground, in a pre-chos e. Alina turned to Liston. He was leaning on the wall with his arms fo e a punnet. Loyonel, he 's there, leaning on the machine and stuffing s hand was suddenly up above her, leaning on the door-jamb. A perfect ee warnings in the last round for leaning on, a decision booted soundly ome funny reason my. Well you 're leaning on the table now, I ca n't t hat record. There was no place to lean on; there was no place for some Mothers leaned on children for support while ar Claude, 72, of the exhibit. He leaned on a cane and occasionally st e my baby boy " one woman sobbed, leaning on her husband 's shoulder f e stage level, sitting, lying and leaning on more coffins. Richard Lee e of approval among fellow fighters leaning on a wooden bar covered with aceful people " one old man said, leaning on a staff, his blue eyes bl Mr. Simpson and a female that was leaning on the hood of a car. CLARK: wly through seaside Mirador Park, leaning on aides from time to time a s there 's a line of 200. Domingo leans on the doorjamb, smiles, shake oks, art and the rolling cart she leans on for walking when her nurse propel or lead the person. Don't lean or hang on a wheelchair. The ch fer the time bein', thanks " Fred leaned out and grabbed Carrie around ting more naturally to the gusts, leaning out and then easing out the bowls of candy. We in the gallery leaned out and counted the white hea her rebel chiefs. Victoria Garcia leaned out the door of her small dry on a central street, as residents leaned out windows and balconies to brochure includes a photo of him leaning out the cockpit window of F1 ould fly " But police said he was leaning out the window to retrieve a he car came alongside me. Coombes leaned out of the window and shouted m from behind. It was Tom. He was leaning out of the shelter. Afternoo ) of water that 's almost boiled. Lean over the steam so you 're about ca n't blame her. And, he used to lean over bloody fence while she wer Did you see that " What wee car " Lean over. erm Aye. I thought that r ing-tip to his scratched hand, he leaned over to take the skull. Do n' going to be all right " Catherine leaned over and hugged her friend, t our point, have n't we " The man leaned over the bed as if he was goi ok here " At this point Maidstone leaned over the table in an earnest, erked open. Nice " he smiled. She leaned over him more closely ana kis anyone else until our ambassador leaned over and said " I would n't d kage of the bed again. The guests leaned over the rail, jeered, and sh d made as if to turn back. Pascoe leaned over and opened the passenger f feet at once, and instinctively leaned over the battlements, craning o. The rest you know " Mandeville leaned over and tapped the book. And study of the dead man. Athelstan leaned over to perform his own exami ything would be tangled " Corbett leaned over, putting his hands on th ginning to stop sweating when Jan leaned over and whispered " Why did the soldier lay on the grass; he leaned over her pink blouse and thei ive up " she said to herself. She leaned over the edge of the plank. S " We dumped Carol face down and I leaned over to try and turn her. Nev think perhaps you 're right " He leaned over, bracing both hands on t ypocrite " Harriet says drowsily, leaning over to slop some wine into

ue and handed it to Denis. Denis, leaning over, half-raised from the c  
ing up here anyway " he demanded, leaning over to pick up the towel he  
ot restlessly to his feet and was leaning over the green wooden railin  
o the stores to get something and leaning over the counter to get some  
the head, and handed it to Sally, leaning over so I could get close to  
an shakes me. Right " he says. He leans over me, puts his big fingers  
ee nearly touched, as the two men leant over the table to hear what th  
anage " Thanks " he grinned, then leant over and kissed her on the che  
the proximity of her body as she leant over the desk. First we took t  
the crossword or something my dad leant over me and I went, yeah, oh r  
turned red with laughter. Tipper leaned over and shook Al. ' Al, what  
ere 's a place such as Yarrow. 'I leaned over my writing loft and yell  
inkled in pain, and Tran Thi Xuan leaned over to massage his temples.  
mance. In the background, a bride leans over and kisses the groom; in t  
ame seasick during a day trip and leaned overboard. Slamet recovered i  
hly into the back, with the Woman leaning round in the front seat to p  
d took the appropriate action. He leaned sideways, looking out of the  
face. The man trembled with rage, leaning slightly forward because of  
f the Metro once more. But Morse, leaning slightly towards him, opened  
he suddenly dropped her voice and leant slightly forward. Your Papa wi  
appy birthday to Elvis " he says, leaning solemnly into the microphone  
ny tendency for a distribution to lean to one side, i. e. to deviate f  
e blizzard had made her [a totem] lean to the left. Grandmother Asha,  
seams in his body-harness, and he leaned to his right side, favouring  
n the house, my Prospero 's cell, leaning to the peevish flame of an i  
or, sit in the driver 's seat and lean to position your head at the ca  
plodded between small houses that leaned together. Through their open  
ide would look up, and Beth would lean towards him, no doubt answering  
tisfied with what he had seen, 'he leaned towards Tolonen. I heard all  
voice faded away. He knelt up and leaned towards Lucien. His hands rea  
its lumped spine, Its feeble hips leaned towards its shoulders for sup  
k here less you 've got a " Louis leaned towards him and said with eno  
on my dispositions at last, " She leaned towards Theda suddenly. And y  
ir again, then focused on Tallis, leaned towards her, made another awk  
ostile " Why " demanded Meredith, leaning towards him and impatiently  
gine noise: Epstein as he listened leant towards Brahe, and Brahe as he  
ates, always being careful not to lean towards one of the so-called "  
ould come round on his cycle just lean up against the er lamppost and  
ouple of basses that were sitting leaning up against a wall in my hous  
. I built my fence. The one I ' m leaning up against is the one I put  
Boston Strangler " sat silently, leaning way back in his chair, coat  
-aged Serb in a faded blue dress, leaned wearily against the counter o  
pulls the sweater over his head, leaning well forwards from the hips.  
s have greened, though many still lean west, pointing out the directio

VERB 2, S P A: [[ Person]] lean {on [ ^{ PhysObj}]} (= rely on)

, like it or not, is likely to be leaning fairly heavily on the US for  
ything from that document, but it leans heavily on this which is the R  
ly player-manager, at Swansea, he leant heavily on former Liverpool cl  
ment, which he has hinted would lean heavily on allegations that pol  
te action. The administration was leaning heavily on its argument that  
decided on " Big City Blues " to lean more on her playful, youthful v  
or Burton 's the tailors. I later leaned on his sartorial knowledge wh

VERB 3, S P A: [[ Person]] lean {on [[ Person | Institution]]}  
(= put pressure on)

d you 're very much aware you 're leaning on him. " I could feel the w  
fits can provide benefits only by leaning on them to pay taxes. And th



VERB 4, S P A: [[ Person]] lean {to | toward [ ^[ PhysObj]]}  
 (= choose or consider choosing)

t that is like " Young said. Cash leaned to the country side of rockab  
 30, a police officer and Democrat leaning to Dole. You don't feel ther  
 the Shoes. If anything " Hubbub " leans to the whimsy of " Sgt. Pepper  
 here goes to the Rhino set, which leans to older artists like Jim Reev  
 aste in politics is often said to lean more toward international than  
 certain that the decisions he is leaning toward are iron-clad " But  
 ion was reached, but the scholars lean toward making a new word "Ma'a  
 democratic rule. Only 10 percent leaned toward dictatorship.  
 new editor, said many journalists leaned toward accepting the go  
 8 presidential race. He initially leaned toward conservative Texas Sen  
 communist movement. Those purged leaned toward the Soviet Union and w  
 ng her lover 's wife says she was leaning toward a guilty verdict. The  
 e. One legislator who said he was leaning toward supporting the measur  
 ler of Cleveland found the public leaning toward passage of the measur  
 , Raymond Seitz, said Clinton leaning toward sending a fact-finder  
 delegates, both her own and those leaning toward Charest. She is doing  
 rchives. The news agency has been leaning toward Boris Yeltsin during  
 slators who had been undecided or leaning toward supporting the trade  
 aid " that in Sicily the Mafia is leaning toward Forza Italia and newl  
 h the Energy Department generally leaning toward ending the ban. Depar  
 said Wednesday that officials are leaning toward the suicide scenario.  
 ly identical measure in Idaho was leaning toward defeat but remained t  
 ional 21 senators were opposed or leaning toward voting no, and 32 wer  
 epartment sources Wednesday to be leaning toward allowing more ships,  
 ave to enforce it. The states are leaning toward requiring that oyster  
 Boris Yeltsin has showed signs of leaning toward increased state contr  
 er runway. The plane came to rest leaning toward its left wing and wit  
 ay 11 accident, investigators are leaning toward blaming a fire starte  
 said they would vote for, or were leaning toward, Clinton to 35 perce  
 ler, has 50 years on Tsai, and is leaning toward Clinton " though I wi  
 o lives in Newton, Mass. , and is leaning toward the Democratic ticket  
 voters who had been undecided or leaning toward Clinton. But they sai  
 ht 's collision, and the NTSB was leaning toward human error, Black sa  
 etwork support. The company won't lean towards Kode Computers ' tradit  
 igence contacts with Iran; Israel leaned towards favouring Iran in the  
 course. The resultant design has leaned towards a course more heavily  
 ange. I guess I do have a slight leaning towards comedy, but I find i

VERB 5, S P O A: [[ Person]] lean [[ PhysObj]] [ ADJUNCT[ Position]]

thing, put a VCR on the roof, and leaned a ladder against the outside  
 ledges for books " says Clodagh. Leaning a book with a lovely cover a  
 ked. She did n't wait an instant. Leaning her bike against the gate, s  
 t eased himself into an armchair, leaning his cane against the wall. A  
 You 're right, Dick " Martin now leant his gun gently against the thi  
 ad " Now think on " Stanley said, leaning the discarded wheel against  
 lking there. Inside, the soldiers lean their M-16 rifles in a corner b  
 iping the mattresses down and had leant them up against the wall to dr

VERB 6, S P O A: [[ Person]] lean [[ BodyPart]] [ ADJUNCT  
 [ Position]]

Lexical set [[ BodyPart]] = { head | back | arms | body}

to the bushes in a wild leap; and leaning both hands on the pommel of  
 over a cushion so that she could lean her damp, aching head against i  
 Maggie 's colour improved and she leaned her head against Sarah 's sho  
 red to make its ideals a reality. Leaning her head tiredly against the  
 other funeral. He stood aside and leaned his back against the wire pal

ared in Felicity 's cheeks. Keach leaned his little forearms on her de  
out from the side of a building, leaning his back against the buildin  
r was forthcoming. The little boy leaned his face to one side as if he  
Leaning his tired body on a cane, Ch  
melody. They end near each other, leaning their heads together. The th

VERB 7, S P O A: [[ Person]] lean {bulk | weight} [ ADJUNCT  
[ Direction]]

lser is just being polite when he leans his bulk forward and says " I  
hands on the rim of the sink and leaned her weight forward. Glancing  
her ankles between his knees and leaned his full weight against her.

VERB 8, S P O: [[ Person[ Politician[ American]]]] lean [[ Political  
Party]]

[[ Political Party]] = [ N | Adj]

neral Robert Abrams, D. Georgia " Leaning Democrat, Sen. Wyche Fowler.  
e exceptions. Historically, women lean Democratic, but Dole cannot who  
asha-d vs. Gov. Fife Symington-r. Leaning Democratic. ARKANSAS Gov. Ji  
th 262 electoral votes " that now lean his way. Among them, Kohut note

VERB 9, S P: [[ PhysObj]] lean

und shifted underneath it. It now leans about 13 feet off the perpendi  
oosen in wet weather and begin to lean. larch-lap produces a universal  
an before. He speaks more slowly, leans more eagerly, so as to offer m

#### UNUSUAL AND JARGONISTIC VERB USES

cott mckenzie is also among those leaning in favor of an independent r  
of rated power, therefore one can lean. When climbing at full throttle

[ Full text: The Old Wives' Tale "Don't lean below 5,000 feet" resulted  
from the fact that above 5,000 feet, full throttle at red-line rpm  
gives less than 75 per cent of rated power, therefore one can lean.  
When climbing at full throttle, the 2,300 rpm or so of your fixed-pitch  
propeller probably delivers less than 75 per cent.]

VERBAL NOUN: leaning

school at which I was CFI taught leaning in Exercise 4 and throughout

VERBAL NOUN: leaning(s)

in " Can you discern an editorial leaning or tendency in the work they  
of us regardless of our political leaning " said former Democratic Par  
as been quiet about his political leanings and did not give any hints  
e a justice not for his political leanings as much so as for his abili  
servative and isolationist in its leanings. Asia is a vital u. s. inte  
and that it could make money. My leanings had always been towards the  
se isms " War: Sukarno 's Fascist Leanings He grew ever bolder in what  
er party. Indeed, the ideological leanings of readers ' papers had mor  
f a broad survey of the political leanings of America 's religious gro  
hat he perceived to the communist leanings of Kennedy and other govern  
and blacklisted for his communist leanings, Seeger recently went on a  
te People. Buchanan denies racist leanings that some critics have draw  
evidence were accused of communist leanings, the report said. The unive  
anage. I guess I do have a slight leaning towards comedy, but I find i  
members of the Committee who had leanings towards a particular style  
they didn't know of her political leanings when she was nominated for  
oes some of his more inaccessible leanings to tell a straight tale wit  
affirmative action. Those liberal leanings were balanced, however, by

PHRASE: leaning tower

the Pisa of duomo, baptistry and leaning tower " but to many of its l  
Archaeologists digging under the Leaning Tower of Pisa have found an  
The leaning tower of Pisa has stopped it

ADJ 1: lean [[ Human | Animal | Body Part]]

ic gene that correlates with how lean an animal will likely be " said  
for him again, and his arms felt lean and hard through the sleeves of  
e sun. To make himself especially lean and bronzed for his meeting wit  
hirt the Frenchman 's body looked lean and hard, and she guessed he mu  
Chertro, her fedpol friend of the lean and grinning face. I was please  
re prowling round each other like lean and hungry panthers waiting for  
ef cattle], it is growing longer, leaner and taller, especially during  
Africa " Hopcraft is middle-aged, lean and lanky, with a long, narrow  
ust have left them all fitter and leaner at the end of the day. The ca  
The second man, who was tall and lean, came running from the glade in  
hard to forget " and more: tall, lean, dark and almost painfully attr  
p. Buckmaster ran a hand over his lean face. It 's essential at least  
He is not much older than her, a lean figure, his jeans patched, not  
middle-aged man, loose-limbed and lean, got out of the driving seat an  
nt " He glowered at her, raking a lean, hard hand through his hair. Ye  
a horse, sometimes fat, sometimes lean, is all the while the same hors  
a square shape that concealed his lean jaw and fallen cheeks as much a  
ned, Hollywood star. His build is lean, like Grant 's or Gary Cooper '  
body. The sheer size of the dark, lean, muscled male body made her thr  
Schuylkill River. The Biglins are lean, muscular and athletic, but the  
to account for the fact that many lean people were smokers or had life  
ds, Jeffrey Meek has that whippy, lean physique associated with black  
ikely to develop cataracts as the leanest, researchers said after trac  
Sabrina, her eyes sparkling in a lean tanned face, likes to talk to h  
t middle-aged women should be far leaner than the standard recommendat  
running. She thought how long and lean they were, a true artist 's han  
lean-flanked wild and free horse. Or  
y-five years old, scruffy, fairly lean, with a young ungainly beard on  
way for the castle. His face was lean, with a distant, other-worldly

ADJ 2: lean [[ Meat]]

ttles of milk, and half and half. Lean bacon. Mustard. Peanut butter.  
be slim. MENU BREAKFAST 1 oz(25g) lean ham (all fat removed) served wi  
rses might include fish, poultry, lean meat and vegetarian dishes, but  
k fish " both white and oily very lean meat poultry " but without the  
oyce to prepare a special diet of lean meat, fish, pasta and protein.  
and pulses, unsweetened cereals, lean meat, poultry and fish. Look fo  
c knife. He cuts small fillets of lean meat the size of quails ' breas  
ins, fresh fruits and vegetables, lean meats, fish and poultry, and sk  
low-fat sausage lovers, there's a Lean Poultry Sampler (\$45) from Aide  
n(no skin) or I ounce lean ham or lean roast beef(remove any fat), and  
Public Voice. Even if pork may be leaner than some beef products, the  
e Simmental, and the meat is very lean. There is also some double-musc

ADJ 3: lean [[ Muscle]]

gen balance and limit the loss of lean body mass. Exercise should grad  
ercise to increase the amount of lean muscle tissue and decrease the  
by surprise when twelve stone of lean muscle powered into him at snak  
problem. Exercise helps preserve lean muscle mass, an important benef  
ugh protein have deterioration of lean tissue, immune response and mus

## ADJ 4: lean [[ Institution | Business Activity]]

at while the U. S. forces will be leaner, America will not abandon the he economy by keeping inventories lean and holding a minimum of promot xpect eventually to evolve into a leaner and more efficient organizati cept smaller paychecks and create leaner businesses that offer product ervices to taxpayers and create a leaner but more productive governmen hird, a new kind of government, a leaner but not a meaner government t g payrolls and production systems lean, companies are focusing more on e government department back to a leaner, healthier size " Enough is e lean levels pending a pickup in dema rming Russia 's large army into a leaner, more professional, all-volun f 1993, the Big Three have become leaner, more innovative and more pro ill and make the benefits package leaner. One possibility is that the e described the White House as a " lean operation " without excessive p that because of the move towards a leaner operations, no less than 80 p iness efficiency these days means lean payrolls. While the split is gl peration in Europe designed for " lean production " a Japanese managem to more profitable retail sales. Leaner production costs are allowing and his ministry can survive as a lean, scaled-down operation. There a health subcommittee guarantees a leaner benefits package than Clinton post-cold War era. She foresees a leaner United Nations concentrating

## ADJ 4 Cliche: "lean and mean"

ced. Businesses are, as they say, lean and mean, and competitive again ays are in keeping with Ibanez 's lean and mean approach, with easy a e most effective bloodsuckers are lean and mean. Doctors alert him whe thdays " are just as likely to be lean and mean, says psychologist Leo ld have to take steps to become " leaner and meaner " The company blam inful tradeoff " Sinai said. The leaner-and-meaner and downsizing is s. The only way IBM can be really leaner and meaner is to reduce headc leaner, meaner alternative puts the lean not mean " We can't avoid our r we must be careful not careless,

## ADJ 5: lean [[ Time Period]]

rative Office " he said. In these lean budgetary times, I believe ove ng work from them and there was a lean period for the sixteen Girls le After a long lean spell in the late 1980s and ear al euphoria. Richard was having a lean time. He was in a state of perp dealers. ANALYSIS Hooray for the lean times " Our new world industry And did they, they must have had lean times if they sat around and wa on Army, an unusual windfall in a lean year for some charities that ha how did it manage to survive the lean years " What special ingredient drawn since 1818, except for the lean years of the 1936-39 Spanish Ci takes blind faith to survive the lean years, White said. We always kn alls the tourist boom after three lean years a " sort of miracle " She

## ADJ Exploitations

nd glowing caverns; did it have a lean and hungry look, deprived, excl ongs like " Wasting My Hate " are lean, aggressive and spitting. Hetffi d trim at just above the knee, or lean and layered for longer lengths. the couture silhouette is longer, leaner and more feminine than ever, een too large and expensive for a leaner fair with a thinner list of a Karan and Perry Ellis. Long and lean skirts with sexy, high-cut slit

## NOUN: leaner

earer of double-breasted suits, a leaner on bars, a discussor of inter

NOUN: leanness

20 kg/m. The association between leanness and fertility has been extended earlier and began to develop a leanness and the agility to cope with

NOUN: lean

is no fat and the wife who eats no lean. For a man so rooted in his domain and meat for potting: Take as much lean of boiled ham as you please, and might be followed by seven years of lean. To move in such landscape was

NOUN: lean-to

is found just outside the window under a lean-to, beside a stack of peat. The frequently found is the barn with lean-tos built against it to provide El Salvador's hills, in tents or lean-tos, eating little more than cooked body out of a manure pile in a lean-to near the calving shed. Last 60 mph. Four campers rescued from lean-to on Appalachian Trail. RHODE Island proved to be too close to the lean-to roof to give a habitable room allow ventilation at the apex of lean-to roofs the new Abutment Ventilation man who had recently added a lean-to scullery and installed water

## APPENDIX 2: Corpus sample: tank | tanks

NAME

in City school superintendent Don Tank said Foster would not have been his

NOUN: [[Armored Combat Vehicle]]

rounded by Israeli soldiers and tanks.  
 strength. Saddam lost some 3,000 tanks, 1,860 armored fighting vehicles a  
 craft, 645 leopard-series combat tanks, 1,043 infantry combat vehicles, 1  
 osnia, gives orders to strike at tanks. 1408 " Heavy shelling into city.  
 triumphantly into their city on a tank 50 years ago. He described the livi  
 ussia has already scrapped 1,141 tanks, 608 armored vehicles and 2,709 ar  
 S. contribution includes 45 M-60 tanks, 80 armored personnel carriers, 84  
 outains. The Syrians used their tanks against the leftists without compu  
 e deployment of crack troops and tanks against civilian pro-democracy pro  
 , is the largest manufacturer of tank ammunition and medium caliber ammun  
 or rifle division supported by tanks and artillery had been halted by 6  
s of fifty-seven of the precious tanks and ten of the even more precious  
 ia which policed the zone, used tanks and heavy machine guns to force th  
 d China develop its advanced T80 tank and the M9 and M11 missiles, which  
 s, the general would pass in his tank and throw cartons of cigarettes to  
 , slightly radioactive dust from tank and aircraft cannon rounds made of  
 ough the sale of shoddy fuses for tank and artillery shells. Six other peo  
 evo was bombarded by at least 68 tank and mortar rounds for 45 minutes Su  
 ehicles, a cross between a light tank and an armored personnel carrier. A  
 own, but the Serbs renewed their tank and artillery fire after the first  
 , he stumbles onto a camouflaged tank and overhears Bosnian Serb national  
 srael pounded south Lebanon with tank and artillery fire today, the third  
 o buy the parts for Chinese-made tanks, and Thailand agreed, Kraprayoon t  
 Israeli force led by three dozen tanks and three armored personnel carrie  
 de Iraq. They want to move their tanks and self-propelled artillery deep  
 or so to destroy several hundred tanks and weaken the Republican Guard fo  
 ade recently to upgrade its M-48 tanks and supplement them with the Germa  
 compound containing Soviet-built tanks and artillery, which Aidid had agr  
 order dispute, Saddam sent Iraqi tanks and soldiers storming into Kuwait.  
 t the Serbs, who have warplanes, tanks and artillery. Using U.S. military  
 sun Ilbo newspaper said about 10 tanks and anti-aircraft guns were positi

ment forces destroyed three Serb tanks and killed 50 Serb soldiers, but i service most of the 2,500 battle tanks and the 250 aircraft that survived dent state. Although many of the tanks and field guns are obsolete, they ey Khmer Rouge headquarters. Two tanks and an armored personnel carrier w .S. combat troops, more than 100 tanks and an aircraft carrier to the Eas it had no figures. Troops using tanks and artillery destroyed several re some 300 soldiers, backed by six tanks and two helicopters, surrounding t rrm a new government. Troops with tanks and armored cars battled protester on-guided munition for targeting tanks and armored vehicles from greater ht infantry, they lack the heavy tanks and artillery that are the hallmar have about 60,000 men, plus 700 tanks and 800 armored personnel carriers roops prepared their mlal Abrams tanks and Bradley fighting vehicles for troyed or captured 30 opposition tanks and downed four helicopters and on round, carry large cargo such as tanks and Patriot missile batteries and Iraq-Turkey border said Turkish tanks and special forces headed toward t pril 16, 1945: Some 3,800 Soviet tanks and 1.6 million soldiers open a ma r Ivanko. Serb forces, backed by tanks and mortar and artillery positions tanks and artillery by Saddam 's army. B Pentagon reported a shifting of tanks and armored vehicles, stormed the Troops, backed by more than 100 tanks and trucks. They planted the victo s of thousands of planes, ships, tanks and armored vehicles already in Ku d with Kuwaiti soldiers and U.S. tanks and armored personnel carriers rum and other heavy weapons. Several tanks and marching soldiers forward into rmy view is that only by rolling tanks and appears to be modeled on U.S. armor

A new Iranian tanks are stuck in Croatia, he said. Bjo h tanks due four months ago. The tanks are inside the city. The army is s resisting " Hundreds of (Iraqi) tanks, armed with 105mm guns and thermal .N. hardware in. The Leopard 1a5 tank armor, which carry their own sensor h as those designed to penetrate tanks, armored vehicles and three helico ted. The Marines, backed by four tanks, armored personnel carriers and mi ur curfew Thursday, disappeared. Tanks, armoured vehicles, small arms and Mussolini and Hitler " aircraft, tanks, artillery and helicopter gun shis roops fought off the rebels with tanks, artillery and mortars, to include 's call for attacks only against tanks, artillery and warplanes, moved tance as troops backed by battle tanks as he pushed a fallen friend out of . Fang 's legs were crushed by a tank awaits its daily orders. This is th of Serbian shells, a lone, aged tank away, but he held his fire " and a that would allow him to blow the tank barrages and mock air raids kept te on 's southern coast Friday, but tank barrages on suspected guerrilla hid SLA responded with artillery and tank battalions, 48 mechanized infantry Libyan army has 28 brigades, 42 tank battles rage on the southern Soviet eastern Dorsale area. Ferocious tanks, Bosnian radio reported. It said v ack Monday by Serb artillery and tank bowled over power lines, knocking o and Electric officials said the tanks broke through rebel lines and ente small force of 300 soldiers and tanks, but more for psychological balanc source said the army also wants tanks by installing better guns and fir helped the Chinese improve their tank cannon fire by the Israelis and the nd were raked with automatic and tank cannons, machine guns, mortars and ate Friday in a battle involving tanks coming over the Bridge of the Amer king out of our window we saw US tanks crashed through the wooden pallisa just two days before Soviet army tank crewman in the Panzer Lehr Divisio al guilt " said Karl Hoffmann, a tank decoys during the Persian Gulf War ansea company that also produced tanks deployed in the West Bank and Gaz ear and Israeli troops backed by tanks destroyed the Prague Spring reform e through the armour of an enemy tank, destroying equipment inside, kill

brother, Yoram, a corporal in a tank division, was traveling in a milita to reduce the readiness of three tank divisions that would be asked to fi officials said Saddam ordered three tank divisions with more than 30,000 sol uns rattling in my right ear and tanks driving over my head " Bole had le

tanks and killed 50 Serb soldiers, but i tanks and the 250 aircraft that survived tanks and field guns are obsolete, they tanks and an armored personnel carrier w tanks and an aircraft carrier to the Eas tanks and artillery destroyed several re tanks and two helicopters, surrounding t tanks and armored cars battled protester tanks and armored vehicles from greater tanks and artillery that are the hallmar tanks and 800 armored personnel carriers tanks and Bradley fighting vehicles for tanks and downed four helicopters and on tanks and Patriot missile batteries and tanks and special forces headed toward t tanks and 1.6 million soldiers open a ma tanks and mortar and artillery positions tanks and artillery by Saddam 's army. B tanks and armored vehicles, stormed the tanks and trucks. They planted the victo tanks and armored vehicles already in Ku tanks and armored personnel carriers rum tanks and marching soldiers forward into tanks and appears to be modeled on U.S. armor tanks are stuck in Croatia, he said. Bjo tanks are inside the city. The army is s tanks, armed with 105mm guns and thermal tank armor, which carry their own sensor tanks, armored vehicles and three helico Tanks, armored personnel carriers and mi tanks, armoured vehicles, small arms and tanks, artillery and helicopter gun shis tanks, artillery and mortars, to include tanks, artillery and warplanes, moved to tank as he pushed a fallen friend out of tank awaits its daily orders. This is th tank away, but he held his fire " and a tank barrages and mock air raids kept te tank barrages on suspected guerrilla hid tank battalions, 48 mechanized infantry tank battles rage on the southern Soviet tanks, Bosnian radio reported. It said v tank bowled over power lines, knocking o tanks broke through rebel lines and ente tanks, but more for psychological balanc tanks by installing better guns and fir tank cannon fire by the Israelis and the tank cannons, machine guns, mortars and tanks coming over the Bridge of the Amer tanks crashed through the wooden pallisa tank crewman in the Panzer Lehr Divisio tank decoys during the Persian Gulf War tanks deployed in the West Bank and Gaz tanks destroyed the Prague Spring reform tank, destroying equipment inside, kill tank division, was traveling in a milita tank divisions that would be asked to fi tanks divisions with more than 30,000 sol tanks driving over my head " Bole had le

U.S. jets bombed abandoned Iraqi tanks during maneuvers on the fourth ann red by some of the 10 heavy T-72 tanks facing the White House hit the fro burbs. There was also mortar and tank fire reported in some suburbs, and d when Israel used artillery and tank fire and two Cobra attack helicopte tank fire rang out across the barren fie ost-covered village. The boom of tanks fired on the Russian White House i 's worst political crisis since tanks fired 200 howitzer and tank shells mity, said Israeli artillery and tanks forces south of Bir Hacheim in an a , sending his German and Italian tank forces advancing west of Kiev captu of Kiev. Nov. 12, 1943: Soviet tank forces attack German units trapped se. Jan. 24, 1944: Strong Soviet tanks, guns and ships. At home, many Ame were flying fighters and manning tanks had surrounded Khodzhal, and that t armored personnel carriers and tanks had returned to their bases by Wed Peruvian troops and at least 300 tank " he said. That is why it is quiet. om here. It is two hours away by tanks, holding nuclear weapons and battl wn him looking fierce, backed by tanks. I don't want to make an example o d: I do not want to use force or tanks in southern Lebanon today, woundin ropelled grenades at two Israeli tanks in the Bosnian army to 100, one-fo hers. This brought the number of tank, infantry, commando, artillery, air rigades. Also has 100 unattached tanks into the security zone, said secur inforcements of about 50 Merkava tank is challenged by " troops " at a ro soldier commanding an M-1 heavy tanks knocked over a lantern, igniting t living cult members said the FBI tanks lined up as a backdrop to our cere up by flaming torches with four tanks lumbered down the streets. A senio a drenching rain as the Serbs ' tank manned by Russian and Ossetian sodi tijava Lavzanova, 50, told him a tank memorial to the men of Exercise Tig y veterans walked near a Sherman tank might not be up to a real fight in parts. Its MIG fighter jets and tanks. Mikhailov said legal proceedings ne of Russia 's T-80 main battle tanks, missile launchers and other heavy r a parade involving hundreds of tanks mounted with 105-mm guns and other ers have " 120-mm mortars, light tanks near the key suburb of Stup closed the airport. A battle involving Tanks now patrol the city centre, and i here in a shootout with troops. tanks on the streets. Yeltsin announced oscow, with fewer roadblocks and tanks on a main road. An hour later, oth Republican Guard unit with their tanks. On Sunday morning, they reported 0 Russian soldiers and dozens of tanks opened fire on the parliament buil tanks tle on Oct. 4, when Russian army tanks put an end to the Prague Spring in most reformers after Warsaw Pact tanks. Railings survive where a hazard w any use in manufacturing guns or tank regiment and a Russian motorized di ted a gunfight between a Russian tanks repulse an intense German assault nnel, American paratroopers and tanks roll into Chechnya, 10, 000 to 40, use of force. Dec. 11 " Russian tanks rolled into Budapest. It is almost tanks me to a halt in 1956 when Soviet tanks rolled in the next afternoon " fir ight against the conscripts. Two tanks rolled through Beijing streets in e West " he said five days after tanks rolled into Chechnya in December 1 gestani town of Kizlyar. Russian tank rounds hit government positions on itors reported 711 artillery and tanks rumbled through the market at Char sh forces and equipment forward. Tanks sent by Saudi Arabia. Mujaheddin g ember assisted by captured Iraqi tank shells and fire in October, is now rble structure, badly damaged by tank shells. There was no word on casual e with barrages of artillery and tank surrounded by about 10 helmeted sol osives were involved. An Israeli tanks surrounded the last remaining sepa bout 200 armored vehicles and 50 tank " This was a potentially decisive a : a new British invention, the " tanks to put down protests in March 1991 arliament " after Milosevic used tanks to submarines, as the United State ng weapons systems, ranging from tank track as the aircraft swung towards n and he sprinted towards a deep Tanks, transport trucks, and jeeps with kistan, including border guards. tank traps and great banks of boulder cl nerable in times of storm. I saw tanks, trucks, artillery, ammunition and will practice rapidly unloading

up to 40,000 troops, backed by tanks, warships and air power, to rescue  
 le for refitting and sending tanks was apparently never told of the c  
 n a March 1991 protest, and army tanks were dispatched to restore order.  
 ross the river, huge T-72 battle tanks were being prepared. Their young c  
 . Three days later, 7,500 Soviet tanks were rolling toward the city cente

Noun: [[Container]]

ic generators and fuel and water tanks. Aid workers in Baidoa have been p  
 The urine is pumped into a waste tank, and the air is filtered and then r  
 e flames around the 3,000-gallon tank and started the evacuation as a pre  
 ceeded in emptying the ruptured tank and stopped any further leaking at  
 ally in a lagoon and in improper tanks, and of mixing wastes containing c  
 waste that is in 51 underground tanks at the Savannah River complex. Dur  
 a few weeks to establish in the tank before it begins to grow. Eventuall  
 at the experience of a flotation tank. Floating is said to be the perfect  
 gies carrying the fuel and water tanks. He applied for a patent for his d  
 other waste water from a storage tank into a smaller emergency container.  
 7, was pumping liquid waste from tanks into the sea. The Greenpeace ship  
 ad is structurally rather like a tank of liquid and the consequences when  
 black. Both wore face masks and tanks of air on their backs. So did the  
 is no power to pump it into the tanks of a house or apartment building.  
 s so congested he had to consume tanks of oxygen. His body swelled as flu  
 d, without the need for a bulky tank or cylinder. A fan is used to retri  
 your swimsuit. Some have holding tanks. Some have tanks for drinking water  
 d to empty seawater from ballast tanks, that system failed, causing the s  
 o the sewer system. The rest use tanks that dump waste into canals and co  
 , and electricity from the three tanks. The problem here is that none of  
 30,000 gallons of solvents in 20 tanks. The waste dump is on the Environm  
 w pipe that led from the storage tank to the river. They were not obtuse,  
 site 's 149 aging single-walled tanks, which hold waste from the product  
 g maintenance work on nine-story tanks, which should have been depressuri

Noun: [[Container]] (for storage of liquid or gas)

set up in six towns. Two ammonia tanks capable of holding about a million  
 and gas build-up in the storage tanks, Excelsior reported. In Progreso,  
 nothing about the complaint. The tank exploded during a morning shift cha  
 expected. Lajous said the first tank exploded Monday afternoon apparentl  
 ns and fire at a flooded propane tank facility. In Hannibal, in northeast  
 f a towering soybean oil storage tank for the third time in eight years.  
 tial aerial inspections that the tanks have to be empty of oil before we  
 ld ignite flammable gases in the tanks. It 's a very serious safety conce  
 an enormous wind storm " The oil tank moved because it wasn't bolted down  
 the state. Lightning set an oil tank on fire in Wood County, near the Oh  
 iver from the company 's storage tanks on July 26 was broken up after com  
 d. Witnesses said an underground tank supplying cooking and heating gas t  
 it of radiation. The underground tank that exploded Tuesday morning conta  
 g the fuel into an 18,000-gallon tank that was about half full. An effort  
 le working on a 70-foot chemical tank. The deaths came six months after a  
 and Shell in opening its storage tanks. The move will lessen the effect o  
 l is being gathered in emergency tanks, the Interfax news agency reported  
 ston said the oil in the storage tanks was meant to be kept at a safe temp  
 used the explosion in a nitrogen tank, Whelan said Monday at a news confer

Noun: [[Container]] (for fuel on a vehicle or plane)

ntary heater, quirky reserve gas tank, a radio that could hardly be heard  
 as taken up by a huge extra fuel tank. After about two hours flying over  
 he cannister is part of the fuel tank and reliquesies gasoline that has t  
 ay finished attaching a new fuel tank and two new booster rockets to the  
 r was found in the plane 's fuel tanks and in the airport 's fuel storage



efficient engines, lighter fuel tanks and fuselage near the explosive, under the main section above the center to add five gallons to the d. While some of the center ent over the "sidesaddle" d the distributors open the shafts, engine cases, seats, d ran with her before the t gasoline from a punctured g jet fuel: If it 's in the gung tests on the safety of of an airliner, such as the miles on gas in its don't "top off" or n the vehicle 's body and frame. lows fuel to bleed back into the wage, and hookups for extra e has emptied the nation 's vers of ice on the external fisherman carries a rod and cars, not to ct collisions because their yres and the oil, and prevents ice from forming on the recovered 80 percent of the

NOUN: [[Container]] (for water - often with fish in it)

e clownfish you list in the same or dying, isolate it in a small remove the fish to an d give me any information on the overs drown the father in a 2-million-gallon nd cichlid pellets. His and duckweed cleared from other our catfish may regard the whole . Check them carefully in g;F to 85&deg;F. I keep my angel using the purple moon angel your nfish and put it in a hose connected to a small species tank. A single species at I should be able to obtain my ded in very large numbers in any many problems. To set up such a oke down for one of the concrete e of a toilet roll. The u remove the mops, make sure the "The exhibit" an erts I've had a h keeps the tank very clean. The gen Biolife filter in our office eed neon tetras in his community 's called the

tanks and a more durable thermal insulat tanks are linked, but the carburettor i tank are still missing, all of which cou tank as being a natural cause "Well, w tanks. Ash, 47, was one of several ballo tank. Authorities have said the center f tank debris shows signs of having been b tank design of its older pickup truck mo tanks, estimated to hold up to three mon tanks, exhaust pipes and mufflers. That tanks exploded. The BMW went first, its tank fed the flames. The victim 's paren tanks, fine; if it 's in a 55-gallon dru tanks. He said he didn't insulate his fu tanks in GM pickup trucks made between 1 tanks in the wings. tank. It is not permitted to drive on or tanks, Mike Overly, a spokesman for the Tanks on later models are located within tank or the petrol pipe is routed too cl tanks that would allow Endeavour to stay tanks. The embargo was used as a means o tank. There was one last-minute technica tank to the boat landing, preparing to s tanks. Travel to Italy is forbidden. Any tanks were unprotected outside the frame tank. When he returned to the parking-lo tank when it 's filled with super-cold f tank, which exploded in the air.

tank. A pair of either common clowns or tank. A dead snail decomposes very rapid tank and treat it with a proprietary ant tank and feeding requirements of these f tank and set fire to the mother. The cam tank, and backers of the 19-hour trip fr tanks are all full. Jay sells many of hi tanks are rapidly disposed of; and lettu tank as his territory and attack anythin tanks as not all are fully glazed. Examp tanks at 80 &deg;F, as this suits variou tank became overstocked. Did you check f tank, but he died. I exchanged the wras tank, but it was too weak, he said. Marv tank can be taken to mean one of two thi tank, complete with cover glasses, for, tank containing large cichlids. The cich tank containing only the larger species tanks containing contaminated water stor tank could have been built from scratch tank cover is replaced as killies are go tank filled with baby sharks 18 inches t tank for almost one year. I've two clown tank gets plenty of natural light during tank has been running for a few weeks n tank. His letter shows that fish will sp tank. However, recent changes in the wat

scenario must be explored. On one night. It is probably the water urping heavily to and fro in the operties and put municipal water els' An essential part of all eel e decaying organic matter in the on of the fish maintained in the cliner-rocker, and let's bung a re " said Durbin, 29. I saw this arge over the top of the balance s in the lab and four 210-gallon ing or overflowing of water from ater was cleaner than water from al for the beginner 's community fish (not only cichlids). Actual ect spent 56 days in a flotation paint in an 800 gallon lungfish Goma, which has a drinking water rvised in 3-foot-deep greenhouse nerator and an underground water on system. They build up in your d object, such as a filter tube, h, and a squeeze of the foam in ed them. One woman said her fish said. Late Sunday, water storage he loft space. Lag the hot water tling a pipe back over the empty ing by the great dark-grey water sufficient numbers. The breeding

tank I had, the fish panicked and hid e tank. If in doubt, call for help." Lord tank immediately behind our seats. The tanks in orchards. Farmers have also had tanks is sliding glass covers, so these tank " it can lead to bacterial blooms, tank, its size or the size of the bogwo tank of Japanese fighting-fish in the co tank of fish shatter as the ceiling coll tank or cold water feed tank in the roof tanks outside that are part of a five-ye tanks, pipes or apparatus unless you hav tanks, ponds and the polluted Ganges Riv tank. Selecting bogwood and other decor tank size will depend on the species bei tank. The centrifuge was a regular exper tank, then having to completely strip a tank. They wanted to get the man, but he tanks. Those that survived from 14 to 16 tank to keep the air conditioning, eleva tank, unless replaced by regular water c tank wall, or even a rock or flower pot. tank water will suffice to keep these fi tank water was sloshing about. There wer tanks were drained to reduce the boat 's tank. When you have completed the work y tank where his cattle can usually find w tank. Without a word, Bert bent and lif tank. You will require a tank within the

**septic tank**

a Septic tank cesspool or septic age yard, a pool hall and septic oundwater. There are many septic

tank emptied. Cesspools are simply lined tanks has had its share of trouble. A fe tanks in the area and some field crops,

**think tank**

are a natural part of the think strategy in a conservative think hev, who now runs a Moscow think ates creating foundations, think y Research, an independent think Institute, a conservative think ednesday by an independent think cy Analysis, a nonpartisan think Federal Judicial Center, a think nfer with Carter about the think the Freedom Forum, a media think an Enterprise Institute, a think private nonpartisan ethics think Institute, a labor-backed think gy Institute, a Washington think Henry L. Stimson Center, a think dom being Newt Gingrich 's think Acorn and the conservative think y Center, a Brussels-based think Institution, a Washington think ion, said the conservative think al Economics, a Washington think Institute, a labor-funded think

tank 's evolution. In the early 1950s, R tank. A friend said he had become " the tank and recently returned from a well-r tanks and the like after a campaign. It tank. Arun Kumar, an economics professor tank, as the United States urges North K tank called the Fraser Institute, found tank, estimates that the private sector tank for the federal courts, and will be tank he 's opening in Moscow and to seek tank. He begins a yearlong Fellowship ne tank. If you filed for bankruptcy it was tank in Briarcliff Manor, N.Y. There is tank in Washington. It is certainly true tank. In 25 years of trade disputes with tank in Washington. The problem is that tank is just plain wrong " Public record tank Manhattan Institute, the central ad tank, offering a often-heard response on tank, said the selection of Mrs. Bush fo tank set up its first school in 1992 as tank specializing in Grade issues. The s tank that supports a large stimulus prog

ategic Studies, a military think tank. The armed forces are giving the ci Thursday by a conservative think tank. The study by the Pacific Research gie Center, an independent think tank. The party of power doesn't need to , such as universities and think tanks. The Democratic Leadership Council etary and chief of a party think tank, was tried in July and sentenced to stics are the stuff of the think tank, where lively minds, well versed safety net for farmers, a think tank with ties to moderate Democrats sai

### towing tank

ystems with water), or a towing tank (a large tank of stationary water t

### tank engine

as lived and breathed Thomas the Tank engine ever since he wrote the firs ncluding an ingenious Thomas the Tank Engine. But the real fun is going o as the narrator of " Thomas the Tank Engine and Friends " an animated ch oes around the track. Thomas the Tank Engine is another favorite of the p movie based on the " Thomas the Tank Engine " books.

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d Tanks No 3, an RSH 0-6-0 side tank, and Lampport, a Bagnall 0-6-0st,

### tank car

hey were concerned that 14 other tank cars loaded with liquefied propane

### tank barge

the tugboat Emily S was towing a tank barge, loaded with nearly 35, 000 b

### tank cutter

making medium to large holes. A tank cutter has an adjustable arm which

Noun [[ Garment]]: **tank suit, tank top**

e, 1910-style navy-white striped tank suit. These turned into clean, ead of the signature outfit of a tank top and *short shorts*. If the EEOC h were graphics for swimsuits and tank tops. The provocative handkerchief

### UNDECIDABLE ON LOCAL CONTEXT

. Sunday, punching a hole in the tank and sliding along a metal railing. it for the big escalation of the tanks and the gas " Edwards said. Agent at point. Erm as far as the drop tanks are concerned, does that have any on the same rail tracks, as the tank *comes up* over the curve it will til said it was something to do with tanks but nobody knew Rumours. Yeah. Mh ile disconnecting a valve in the tank, he was overcome by fumes. With the for bursting apart, turning the tank into a giant pressure cooker. The S med at limiting disasters if the tank is given less attention than some o utes earlier, a large tree and a tank of some type had floated past. I th overcome by gas after entering a tank on the ship and, other crewmen died st site. A mesh fence around the tank protected it from flying debris, bu y invisible glued seams. On some tanks the panels are curved. Another tan ill occur. In the meantime, gang tanks whose residents misbehave will los