

MEANING CONSTRUCTION IN THE PRODUCTION AND INTERPRETATION OF COMPOUNDS IS SCHEMA-DRIVEN

CONCEPTUAL SCHEMATA AND COGNITIVE OPERATIONS IN COMPOUND CONSTRUCTIONS

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Abstract

This paper develops a characterization of nominal compounds. The analysis is carried out on frame-schematic and construction-grammatical grounds. It rests on assumptions about cognitive processing long since known within cognitive linguistics, but it criticizes certain linguistic applications of Fauconnier & Turner's theory of conceptual integration. A crucial difference between the processing of literal and metaphorical compounds is established. Thus, the approach has a double scope: it aims at characterizing both the semantics of compounds and the way the semantics is cognitively accessed. Our article fits into the theme of this volume by proposing a theory that we believe is much more precise than previous accounts about the semantic input, or 'instructions', that the linguistic items bring to the process of meaning construction.

1. Introduction

We intend in this paper to present a simple but in our view still powerful description and characterization of nominal compound formation in English. This analysis will be carried out on frame-schematic and construction-grammatical grounds. It rests on assumptions about cognitive processing long since known within cognitive linguistics (thanks to R. Langacker and L. Talmy), but it criticizes on the other hand in a head-on manner certain linguistic applications of Gilles Fauconnier's and Mark Turner's theory of conceptual integration.

The first part of the paper very roughly sums up Fauconnier & Turner's analysis of nominal compounds in terms of conceptual integration (Fauconnier & Turner 1996, 2002, 2003; Coulson 2001; Sweetser 1999); furthermore, it identifies one of the major drawbacks of this approach: viz., its limited descriptive range.

In the second part (from section 3 and on), we develop our own general characterization. Initially, we simply propose alternative analyses of compounds recruited as epitomes of non-compositionality. On these grounds, we propose a non-trivial and non-standard *compositional* theory capable of capturing the general way in which semantic parts of a compound are configured into a semantic whole.² Once the schematic scaffolding of compounds has been established, we proceed to a summary survey of how this scaffolding is actually instantiated or processed cognitively. Our approach therefore has a double scope: it aims at characterizing both the semantics of compounds and the way in which the semantics is cognitively accessed.

As suggested, our analysis and its actual elaboration imply certain amendments to a blending analysis of compounds. To put it bluntly, we don't think that the theory of conceptual integration applies non-trivially to this linguistic phenomenon in all cases. This critique may lend itself to misunderstanding. It could be considered to express disapproval of 'conceptual integration' *tout court*. We therefore stress that we are indeed quite sympathetic to the theory of conceptual integration (in our eyes, conceptual integration is an evident cognitive fact). What drives our critique is

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² The very use of the word "compositional," be it preceded by 'non-standard' or not, may give rise to misunderstandings. 'Compositional' in our use is non-standard to the extent that we call those principles compositional that govern the configuration of intensional (and not extensional) contents. Thus, in our eyes, the principle of linguistic combination is retrieved from semantics itself (i.e., conceptual structure), not from the syntactic algorithm that rules the linear combination of extensional contents defined in truth-conditional terms.

rather the wish to limit the applicational range of "blending" theory in order to avoid the trivialization of both the theory and the objects to which it applies. The initial success of the blending concept has given rise to an enormous extrapolation of the concept so that not only riddles, jokes, counterfactuals, and ads, but also very basic perceptual experiences and grammatical constructions such as compound nouns and ordinary genitives are accounted for in terms of conceptual integration. Such a development is, in fact, both normal and sound, insofar as any new scientific discovery must be pushed to its limit in order to determine the range of its validity. The danger, on the other hand, is that this extrapolation process is undertaken with insufficient critical caution, so that the concept is rendered potentially meaningless: to explain everything is, as the old adage goes, to explain nothing.

This paper therefore pursues two goals: it intends to unfold the schematic logic of compound construction and it aims at reinforcing the categorical import of the blending concept by limiting its range of application.³

2 Compounds and Compositionality

Nominal compounds are particularly intriguing phenomena for at least two reasons: (1) As linguistic *forms* they combine two or more linguistic parts into one semantic *whole*; yet, they do so without there being any grammatical marking as to *what* their relation is and *how* it obtains. Otto Jespersen pointed this out already in 1924: "Compound nouns state two terms, but say nothing of the way in which the relation between them is to be understood: *home life*, life at home, *home letters*, letters from home, *home journey*, journey (to) home ... etc." (Jespersen 1924: 310). (2) Very early on, linguists observed that a defining property of compounds is that the global meaning of the compounded whole exceeds the semantic sum of its component terms or is irreducible to their meanings if taken separately. Consider, for example, Krusinga: "A compound may therefore be defined as a combination of two words forming a unit which is not identical with the combined forms or meanings of its elements" (Krusinga 1932; quoted by Bauer 1978: 52). Again, Jespersen made a similar remark: "... we may perhaps say that we have a compound if the meaning of the whole cannot be logically deduced from the meaning of the elements separately" (Jespersen 1942: VI, § 8.1.3).

For these reasons, many linguists have considered compounds particularly intriguing phenomena. Compounds do indeed seem to epitomize the problem of *linguistic composition* as such: by virtue of what rules or principles do significations combine into semantic wholes that are not simply the result of the sum of their respective components?

The formal, classificatory, and more or less generative attempts (Lees, 1978; Hatcher 1960) to find a general procedure for constructing compounds in English are known to fall short in several essential respects. Yet, even though they fail, they are interesting because, in failing, they make two aspects of language clear: first, that a linguistic expression underspecifies its referent, and precisely for that reason has a potential for activating very different conceptual meanings (according to the speaker's intentions and contextual set-up); second, that any attempt to define a combinatorial rule in terms stemming exclusively from the linguistic system as such (*qua* a self-contained formal system) is doomed to fail.

Recently, various cognitive linguists—such as G. Fauconnier, M. Turner and, in a cognate but a rather different vein, E. Sweetser, just to mention a few—have drawn rather radical consequences from this state of affairs and proposed a complete reorientation of the study of compounds (as well as other linguistic issues). The first important element of Fauconnier & Turner's argument is that there exists overwhelming empirical evidence for the fact that the semantic behavior of compounds *is not predictable*, and that this evidence is neither exotic nor far-fetched. If we consider familiar examples such as 'child-safe' vs. 'shark-safe', we immediately see that the element 'safe' does not remain semantically invariant through the compounds, and, thus, that its semantic behavior is not predictable. Indeed, 'safe' takes on two 'contrary' significations in these constructions: in 'child-safe' it reads 'safe *for* somebody'; in 'shark-safe' it reads 'safe *from* somebody.' The same goes for another example we will submit to more detailed analysis below: 'fire station' vs. 'police station' (in a police station there are necessarily police, in a fire station there is not (necessarily) fire). Such evidence is more than enough to call into question the existence of any 'simpleminded,' 'straightforward,' or 'standard' logic of compositionality. It is, of course, obvious also in view of the fact that one and the same composite expression, as Fauconnier & Turner, Sweetser, and others have observed, can take on many different and entirely novel significations in varying contexts. Now, a major point, according to Fauconnier & Turner, is indeed that the overall meaning of such expressions is underdetermined by the linguistic or semantic cues provided by the lexical entities. In other words, their meaning exceeds in principle the sum of their respective parts. Phrased in standard blending terminology, this reads: if we consider the isolated elements of the compound as *mental input spaces* (say, 'shark' is Input 1 and 'safe' is Input 2), then the *blended space* into which these are integrated contains structure and possible inferences that do not exist as such in the input spaces or that could not be obtained simply by adding the structures or features present in the respective input spaces.

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³ In this respect, our concern is the same as Peter Harder's (2003). As Harder, we do not think that an account in blending terms of complex phenomena (in our case metaphorical compounds) transposes immediately to simple compounds.

Therefore, meaning is not a result of a logical rule of composition inherent in language (or ‘language of thought’), regardless of both cognition and context, but a result of an online integration of minimal linguistic cues provided by the input spaces and the frames delivered by the context in which the expression actually occurs. It is a result of cognitive activity encompassing not only the semantic features involved, but also the whole phenomenological setting of these features.

Although we are, in general, rather sympathetic to the many-space model of conceptual integration and do acknowledge the reality of this device for modeling crucial types of cognitive processing, we are nevertheless quite critical towards its application in the particular case of compounds. Our skepticism is twofold: first, it concerns the *descriptive purport* of compound analysis in terms of conceptual integration (or blending)—we will deal with this immediately below; second, it is motivated by the fact that in our view Fauconnier & Turner (among others) underestimate an essential property of language (painstakingly developed by cognitive semantics), namely, that it is not only a formal system that combines syntactical forms linearly (as traditional compositional theory would have it), but also (and primarily) a symbolic means to express genuine significations (thoughts, cognitive representations, etc.). As such it has at its disposal semantic forms of composition or configuration (frames, scripts, schemata) that serve a *semantic* binding function. These are indeed more than mere ‘space-building’, minimal linguistic cues; rather they contribute frames with genuine configurational structure that do not only display a ‘default’ prototypical signification, but also require specific (but not wholly predictable) types of integration with and completion by other types of signification. Since there are no viable standard compositional rules, we believe that the only way to explain why the cognitive processing of compound semantics takes place so easily and automatically and without being noticed, is that it is strongly guided by such frame- or schema-semantic structure. To explain or diagram this in terms of ‘conceptual integration’ without systematically going into frame-semantic details is not enough: the many-space model of conceptual integration (‘blending’) defines a cognitive processing routine; it is not itself a description of either the object being processed (in this case the linguistic phenomenon: compounds) or the kind of contents expressed by the object (frames, schemata).

2.1 The descriptive purport of compound analysis in terms of ‘blending’

The compositional theory criticized by Fauconnier & Turner is of course wrong. The evidence provided against it is conclusive. ‘Child-safe’ vs. ‘shark-safe’ or ‘gun wound’ vs. ‘hand wound’ show, beyond all possible doubt, that such meaning construals are not ruled by any fixed, formal rule laid down once and for-all, and that the lexical entities involved are not invariant building blocks assembled by some algorithmic mortar. A theory claiming this fails in characterizing plain linguistic data. Now, two questions remain: (1) how is the *difference* between the respective usages to be described, and (2) what motivates the use of the *same* lexical element in contrasting expressions? As far as we have been able to ascertain, Fauconnier & Turner do not give any satisfying answer to the first question and do not really raise the second. In other words, instead of answering and raising these, in a linguistic framework, crucial questions, Fauconnier & Turner diagram the way the cognitive system constructs the specific meaning of each of these expressions. What the many-space model (and ‘blending’) shows is that specific meaning *emerges* or is constituted in the blend by means of conceptual integration. It diagrams a *dynamic, cognitive process* of meaning construction, solely from the hearer’s point of view; it does not describe a *linguistic phenomenon* (that is to say, the *object* that triggers the cognitive processing in the first place). We simply do not learn what in fact, structurally, makes up the difference between expressions like ‘child-safe’ vs. ‘shark-safe.’ We only learn that the difference emerges in the blend. And, finally, we do not learn why the same lexical entity, ‘safe,’ is used in both cases. Even a fairly non-compositionally minded linguist might be disappointed to learn that the difference between ‘child-safe’ and ‘shark-safe’ “emerges” in the blend without further specifications. His objection, we imagine, might follow these lines: if your examples immediately show the inadequacy of a straightforward logic of compositionality, then the semantic difference between your otherwise parallel composite expressions constitutes a real point; there is, then, a real point in submitting these differences to thorough examination and not simply making them emerge in the blend, since this comes pretty close to begging the question. We consider such an objection quite justified.

3 Stating our case

To give a concise idea of the theoretical assumptions that guide our analyses here, we will simply quote a passage from E. Sweetser (1999). Her article is in fact devoted to compounds (in a broad sense—i.e., including adjectival modifications of nouns). According to Sweetser, lexical entities do contribute meaning, and crucially so. She considers, just as we will, that lexical entities invoke mental spaces containing “frame and active zone structure.” Furthermore, she deals with the

relation between Noun and Adjective in A-N constructions in terms quite similar to those used in our analysis of nominal compounds; i.e., she pays thorough attention both to the frame-semantics involved—asymmetrically contributed by one of the compounded terms—and to the functional relations between the relevant input spaces, namely, the fact that by virtue of the construction one term specifies or, as Sweetser has it, “elaborates” the frame contributed by the other. Here is her general claim:

What are the general rules about how to put A[djective]-N[oun] meanings in English? Following Langacker’s treatment of modification as elaboration of active zones, we can say that the noun referentially *profiles* some entity as a member of the appropriate (non-classical) category, while the adjective *elaborates* some *active zone* of the entity profiled by the noun. [...] But ‘active zone’ in my expanded sense may include things not mentioned in most previous work: not only parts or aspects of the entity itself, but parts or aspects of the frames associated with it in the complex context of the particular utterance ... (Sweetser 1999: 147). Remark that the above is a very strong (non-standard) compositional thesis: it explicitly regards the relation between input spaces as being governed by “general rules.” What we propose now is simply to state and further develop these rules.

In the following, we will present an analysis in the vein of Sweetser’s. Our main intention is to provide a sound semantic description of a couple of standard examples (‘shark-/child-safe,’ ‘fire/police station,’) on frame-schematic grounds that both *motivates* the use of identical lexical entities in contrasting expressions and *elucidates* the differences between these expressions, while making explicit the semantic contribution of the terms involved. Before proceeding to this analysis—which we consider a genuine piece of cognitive semantics, grounded on insights elaborated by Lakoff (1987, 1988), Langacker (1987, 1991), Talmy (2000), and Sweetser (1999)—we will, in a rather flat-footed way, present our main claims.

Fundamental rules governing semantic configuration (compound formation)

- (1) As linguistic phenomena, compounds are *asymmetric*. In *XY* compounds, *X* and *Y* do not contribute meaning in the same way. In English, Danish, German, Dutch, and other languages (but of course not in Romance languages where it is the other way around), the *X*-term serves as a ‘predicate’ for *Y*; i.e., *XY* is a construction that prompts the hearer to fit the meaning of *X* into a ‘slot’ or a ‘zone’ in a schematic frame evoked by *Y*. On the semantic level, *X* can therefore always be read as a predicate for *Y*: *X* specifies *Y* in some respect. This is of course manifested by a wealth of inverse compound pairs, such as ‘house-boat’ vs. ‘boat house’ and ‘machine coffee’ vs. ‘coffee machine’, ‘cane sugar’ vs. ‘sugar cane’, etc. A house-boat is basically a boat of a specific house-like type, while a boat house is basically a house having to do with boats—not the other way around.
- (2) Compounds are therefore *constructions* in a sense close to A. Goldberg’s (1995). The *form* itself has a meaning independent of what terms instantiate it. In the present case, the point is that whatever appears in *Y*’s place displays *ipso facto* the general focus of attention or the overall semantic frame to be elaborated; and whatever appears in *X*’s place appears by virtue of this form as linked to this frame and as elaborating it in some respect.⁴
- (3) This rule is strongly compositional because it imposes a configurational principle that is invariant through all possible empirical instantiations of the *XY* construction and is fundamentally independent of however *X* and *Y* are construed separately. Yet, there is absolutely no reason why this relation should be simple and predictive. Indeed, this is not a rigid building block conception of compounds, because the frame evoked by *Y* is fluid and

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⁴ Though the issue is interesting, we cannot go into further detail here. Let us simply stress an important difference between our present conception of construction and Goldberg’s. In both cases, semantic import is assigned to the construction as such; however, we will not define the compound construction solely in terms of argument structure but also in phenomenological terms. We consider it, in other words, a linguistic counterpart to a basic feature of experience in general and perception in particular: whenever our attention is intentionally oriented towards an object (be it concrete, abstract, cultural, or natural), this object is always apprehended in a specific way, relative to determinate properties; the whole range of its qualitative, physical, purposeful, or cultural properties is not instantiated *tota simul*. Thus, the linguistic form of compounds simply reflects the basic organizational or structural feature of experience in general. In Talmyan terms (Talmy 2000: vol. I, chapter 4), we can say that a frame displays a structural landscape likely to be accessed in many different ways, yet “attention” can only be “distributed” across a limited number of aspects of it at a time.

dynamic:⁵ it may comprise several qualitative dimensions and it may be dependent, often in a complicated way, on entrenched schemata, on-going discourse, contextual meaning, and implied information.

- (4) The way in which the *X* term specifies the *Y* term is amenable to two intertwined types of theoretical description: (a) relative to the general schema displayed by *Y* and thus to the position or element in the schema instantiated by *X*; and (b) relative to the way the integration of *X* in *Y* is cognitively processed in each empirical case.

4 Case Studies

We will now corroborate these assumptions with a sample of case studies. The choice of examples is not random. We have simply taken over certain examples used as evidence for non-compositional analyses of meaning construal in compounds. Before setting out, we want to emphasize that like most cognitive linguists we do not consider these examples as ‘exotic,’ ‘non-standard’ or ‘farfetched.’ They do not call for more *ad hoc* hypotheses than ‘prototypical’ compounds and are, thus, plain linguistic data and as such good illustrations of what we like to consider a ‘schematic, predicative logic.’

4.1 Fire station vs. Railway station

In view of the preceding remarks, we will consider for instance ‘fire’ and ‘railway’ as different qualifications of the phenomenon referred to: the station. So fire- and railway stations are, in this respect, simply a ‘fire-like’ station, and a ‘railway-like’ station, respectively. Now, ‘fire’ and ‘railway’ do not have the same *kind* of referential scope: fire refers to a naturally occurring phenomenon, while ‘railway’ is a technical device, a human-made means of transportation. Moreover, ‘station’ does not have a simple signification; rather, it refers to a more comprehensive script, scenario, or narrative. A station is generally a human-made stationary artifact, localized somewhere, and supposed at all or most times to serve some purpose. It is the material incarnation of a competence, most often of a social or political nature. Now, this implies that its purpose can be described exhaustively only in a whole narrative script: a station is equipped with personnel, some machinery, and some energy supply in order to be able to undertake some function, supporting certain developments and preventing others. Therefore, this narrative, purposive definition of a station entails that a specific type of station is characterized by a series of properties: its purpose (negatively: to prevent something; positively: to further something else), its machinery, its personnel, etc. This, in turn, implies that such a narrative molecule may be prompted by different lexical elements referring to different aspects of it: the designation chosen may refer to the localization of the station, to its equipment, to its machinery, to its purpose, etc. This gives us a small script-based taxonomy of station types: a ‘border station’ refers to localization, ‘police station’ to personnel, ‘railway station’ to machinery, ‘fire station’ (negatively) to purpose, ‘gas station’ (positively) to purpose, etc.—all these designations being metonymies in relation to the specific version of the overall station script. Thus, a police station could just as well have been called a ‘criminality station,’ an ‘anti-criminality station,’ a ‘law-and-order station,’ a ‘handcuff station,’ etc.—and, indeed, these expressions will be possible slang expressions for that phenomenon, and, in any case, they would be immediately understandable to the average speaker when placed in a suitable context. In fact, if the hearer knows the referent of station, then there is a priori a *non-linguistic* categorization that ensures that if the compound fits the non-linguistic understanding of the referent, it will be understood. We can add the hypothesis that the denomination chosen in the single case may be motivated by what appears most salient about the nature of the station in question. The danger of fire gives rise to a salient and stable iconical representation (a burning house), the much more abstract danger of crime does not. The personnel in a police station constitute a salient image in their uniforms and their constant presence in traffic and urban life; the personnel of a fire station (hopefully) staying inside the station do not

Of course, this notion of ‘saliency’ is relative to context and culture. Thus, the other way around, the same composite noun might very well refer to different types of stations, depending on the ‘slot’ chosen in the station scenery. In Paleolithic times, a ‘fire station’ could have been a public place where fire was kept burning in order for people to get

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⁵ Cf. Langacker’s term “quality space” (*W*) and the subsequent idea of it being constituted by several “subregions” (*W*) (Langacker 1991: 74). We consider these subregions the constitutive moments of the script or frame underlying the semantics of the lexical entities. Accordingly, preeminence can be given to one of the quality dimensions defining the schematic “quality space.” ‘Pills’ can therefore be defined with respect to the quality of ‘substance’ (‘vitamin pills’), the quality of ‘function 1’ (cause something: ‘sleeping pills’), or ‘function 2’ (impinge on something: ‘nerve pills’)

an ember if their fire went out (an institution like the Temple of Vestalines in ancient Rome seems to have had this function); a ‘fire station’ might be a medieval department under central inquisition ready to hurry out to cremate any witches or heretics likely to show up; a ‘fire station’ might in Babylonian culture be a station equipped with personnel predominantly having fire signs in their horoscopes, and so on. But in each case, the narrative station script would motivate different construals.

4.2 ‘Child-safe’ vs. ‘Shark-safe’

Analysis in terms of ‘blending’ seems to presuppose that the component term ‘safe’ has only a very vague semantics—since it is likely to undergo rather considerable changes from one expression to another (from, say, ‘shark-safe’ to ‘child-safe’ to ‘dolphin safe’). Its signification is thus ‘fixed’ on line or *ad hoc* according to the type of conceptual integration fulfilled. This presupposition is inadequate to the extent that it identifies ‘distinct semantics’ with ‘mono-valent,’ ‘invariant’ signification (laid down, once and for all, in a dictionary). We claim that ‘safe’ has a distinct, canonically bi-valent signification, represented by a *schema*. We claim, next, that this schema is very primitive, very fundamental, and indeed deeply *embodied* (no animal would survive without mastering this basic biological diagram). We claim, further, that thanks to this schematic conception of semantics, it is possible to defend a predicate-subject analysis of compounds on non-simpleminded compositional grounds. And we claim, finally, that it is possible to provide a very simple description of the actual difference between the values of ‘safe’ in ‘shark-safe’ and ‘child-safe.’

The canonical frame of ‘safe’ implies a schematic set-up consisting of a partition into two zones; i.e., one zone delimited by a real or, more often, a virtual qualitative frontier within which one is protected from external sources of danger or an intruder, and another zone in which such sources of danger are located. The point is simply that each zone, and in certain cases the frontier itself, constitutes a potential “active zone” (Langacker, again), likely to be activated in any instantiation of the frame ‘safety.’ This schematic device provides a very simple explanation of both the difference between ‘child safe,’ ‘shark-safe,’ as well as (in another grammatical form) ‘safe distance,’ and the reason why ‘safe’ is used in all these cases. It also proves that the ‘integration’ of the terms is highly constrained by the frame contributed by only one of them (*Y*), and that the other term (*X*) takes on an actual meaning only insofar as it instantiates a constitutive aspect of *Y*.

In ‘shark-safe,’ preeminence is prototypically given to external sources of danger; ‘Zone 2’ is instantiated as active zone. In ‘child-safe,’ preeminence is given to the internal domain of stability; ‘Zone 1’ is activated and ‘Slot 1’ specifies the nature of the entities being in safety. Obviously, the same holds for ‘dolphin-safe.’ One can of course add new frames yielding all sorts of new meanings of ‘safe’ but we consider the diagram to be a representation of its default schematic meaning.

Our analysis is surely compositional insofar as it claims that the semantics of the lexical entities involved plays a crucial role, motivates the very use of the relevant lexical entities, and, most importantly, *constrains* the on-line construction of the overall signification. It thus helps us determine the nature of the relation between the correlated lexical entities and provides a sound basis for accurate and adequate linguistic description (elucidation of differences, motivation of similarities).

In other words, we claim that there exists such a thing as a ‘schematic algorithm’ underlying the meaning-construal of compounds.⁶ Note, however, that the linguistic tools used in our analysis do not stem from any of those theoretical traditions cognitive linguists usually stigmatize as “objectivist.” We refer to the semantics of the lexical entities in (Langackerian) terms of “qualitative regions” in some regions provided with highly schematic properties and likely to be instantiated in manifold ways. Thus, the schematic constraints on meaning-construal (*which, we stress, is exactly the factor that enables easy, automatic, and unnoticed performances of meaning-construal via an overall interpretive template*) are not unequivocal, one-dimensional, and predictive. Nothing in the schema of ‘safe’ allows for the prediction of signification since the schema is essentially multi-dimensional. Consequently, the exact signification is not deducible from the schema itself, but depends on the recognition of what zone is activated in it and how it is activated with respect to the whole schema. Therefore, meaning-construal is reducible to neither simpleminded compositional algorithmics nor

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⁶ We use “schematic algorithm” similarly to G. Lakoff, cf.: “One of the reasons that schemas have become popular within the cognitive sciences is that they can be represented as symbolic structures and manipulated algorithmically” (Lakoff 1988: 135-136). As Lakoff often emphasizes, these schemas are meaningful; one of the classical tasks of cognitive semantics consists in characterizing the meaningfulness of such schemata.

mere unpredictable cognitive processing, even when phrased in terms of blending. Obviously, in ‘safe’ cases, meaning is stabilized according to the recognition of *speaker’s* intentions, and according to phenomenological patterns recognized in the referent scenes. The recognition of phenomenological patterns in the referent scenes provides the cues that allow an adequate activation of the schematic zones.

In general, we can say that, given a general frame displayed by the *Y*-term, the element of the schema that a given language highlights is a contingent matter of choice. For example, in the case of constructions with ‘wound,’ (as in ‘gun wound’) the schema displays a micro-narrative scenario consisting of a *location* and a *origin*; the latter is itself likely to be instantiated in several ways as, say, *instrument*, *act*, *agent*, or *circumstances*. In Danish, for instance, ‘gun wound’ is *skudsår* (lit. ‘shot wound’); that is, Danish prefers to highlight the act rather than the instrument (this is of course possible because ‘shot’ evokes the instrument and similarly the instrument evokes the act). This difference between Danish and English supports the argument that there is a Talmyan *window of attention effect* in the compound: ‘skudsår’ has a window to the act and the result, gapping the instrument and the agent, whereas ‘gun wound’ has a window to the instrument and gaps the act and the agent. Observe that in English, one can also speak of a ‘bullet wound,’ which just shows that these frames can be further decomposed: the agent acts on an instrument, which acts on another instrument, etc. We return to this below.

4.3 ‘House rat’ vs. ‘Mall rat’—literal and figurative use

Up to now, our analysis has remained to some extent similar to Sweetser’s frame-semantic account in her 1999 article. There are, nevertheless, remarkable differences between our approaches, which we will develop in some detail here. According to our hypothesis, the semantics of compounds is strongly constrained by their very predicate-general frame form (this is not emphasized by Sweetser). If, as we maintain, the *Y*-term contributes the overall frame, then it guides meaning by supplying a flexible array of possible significations to be specified by the *X*-term. The *X*-term is therefore from the outset strongly linked to the *Y*-term, and takes on a signification only insofar as it specifies something pertaining to *Y*. Consequently, contrary to Sweetser and *a fortiori* Coulson and Fauconnier & Turner, we do *not* consider the *X*-term as evoking an *autonomous* mental space; rather, we consider it a ‘satellite’ space in respect to the conceptual space of *Y*. In other words, the schematic changes observable in such constructions and the different roles that ‘dolphin’, ‘child’, or ‘shark’ play when combined with ‘shark’ are *not*—contrary to what is usually claimed—due to their respective frames. That is to say, it is not simply because we ‘kind of find dolphins cute’ and ‘children in need of protection’ that we construe ‘safe’ as ‘safe for’ when combined with these words. The signification that ‘safe’ takes on in these cases is critically dependent on the position in its schema that they activate. This is, by the way, the very reason why an expression like ‘child-safe’ can be used to signify both ‘safe for’ and ‘safe from’ children according to the context.

Our analysis differs in yet another respect from classical literature on the topic. It is namely tacitly assumed that the *same* cognitive processing of compounds is at stake in all cases, so that there is no major difference between the processing of compounds where, for instance, *Y* is a metaphor and compounds where *Y* is not a metaphor. In the classical ‘blend’ understanding of such cases, it seems as if this is a mere question of different online integrations of mental spaces activated by the *same* cognitive process, whereas in our conception the access to the underlying meaning relies on or may rely on *different* cognitive processes, depending on whether or not there is integration within one mental space.

Let us illustrate our point by contrasting two examples: ‘house rat’ vs. ‘mall rat.’ ‘House rat’ does namely seem to provide nice, clear-cut mappings between full-fledged mental spaces. According to a standard analysis, we would have an Input Space 1, cued by ‘house,’ and an Input Space 2, cued by ‘rat.’ Now, among other things, houses are conceptually framed as places in which different beings live. Rats, on the other hand, are like animals, of course, framed as having a habitat. ‘House’ then maps onto the habitat of rats, and ‘rat’ onto the habitants of houses. QED.

Obviously, this account is fallacious. It misses the fact that even though ‘house’ maps onto ‘habitat’ in the rat frame, ‘rat’ *does not* in a symmetric way map onto ‘habitant’ in the house frame: rats are not the true/exclusive/genuine habitants of houses in our default sense of ‘house;’ they happen to be or have their habitat in restricted parts of it, but they do not ‘live’ there in our sense. (Notice that this would be the case for ‘rathouse,’ just as in ‘doghouse’.) Once again, we consider that predications of this sort are suitably analyzed in non-blending terms within the framework of a schematic logic of predication according to which the relation between the component elements should be determined in terms of the specification of schematic positions within one frame.

Now consider an example that contrasts with ‘house rat’: ‘mall rat.’ Since ‘mall’ is framed as a place, the analysis of ‘mall rat’ should apparently be the same as for ‘house rat.’ Yet, this is not the meaning of the expression, which refers

to teenagers hanging out in a mall. In this case, the understanding of the meaning does require the single elements to be *unpacked*, a clear indication of blending. What would motivate this unpacking? Phenomenologically speaking, of course, the communicational situation and the identification of the speaker's intention (the fact that he is not speaking of real rats). In our view, this compound involves two genuine input spaces which represent full scenarios, as opposed to conceptual schemata with only one scenario and positions to be specified. In the present example, Input Space 1 is a specific scenario—a mental space in Fauconnier's sense—which can be described as 'teenagers hanging around in a mall,' and which has an experiential counterpart. Similarly, Input Space 2 is a 'rat'-space, including the prototypical habitat of rats, prototypical rat-behavior, and diverse folk knowledge and folk assessments of rats. The main feature of the relation between these input spaces is of course that the element 'teenagers' is mapped onto 'rats.' However, it is not precise enough to say that rats are substituted for teenagers, because it is the whole structure of Input Space 1—or of the perceived scenario in the real phenomenological space—that is mapped onto the conceived space 2. There is a pattern of behavior in the teenager space that can map onto a pattern of behavior in the rat space. The expression is therefore a prototypical blend with mappings across genuinely organized spaces and with resulting emergent significations: the parasitic character of the teenagers.

Our position may seem unsatisfying in one quite critical respect. One of the basic reasons why the theory of conceptual integration has been so widely accepted is that it applies homogeneously to a wealth of phenomena hitherto considered substantially different. Instead, we reintroduce differences by saying that certain compounds, like 'mall rat' and 'land yacht,' are based on blending, while others, like 'house rat' and 'fingernail,' are not. Granted the scientific community's natural preferences for explanatory 'simplicity,' we will have to justify our stance in some more detail.

Our claim is that linguistics is a three-layered business. The first layer is the linguistic level proper; the second is the level of conceptualization or conceptual structure (such as it has been systematically (and admirably) described by cognitive linguistics), and the third is the experiential level on which conceptualization applies. Thus, a linguistic expression *evokes* a conceptualization through which it *signifies* an actual experience, be it physical, social, or mental. At first glance, it seems difficult to distinguish between perception and conception—between our experience of the world and our conceptualization of it—since what is perceptually accessible is already conceptualized (cf. Talmy (2000), in which he introduces the notion of *ception* in order to cover the continuum ranging from "perception" to "conception"). However, if it is true that our mental contents are not simply passive reflections of external states of affair, but are rather the result of conceptual ways of accessing these states from specific perspectives, it is also true that they depend on there being something to be 'perspectivized' in the first place. That is, nobody can use the word 'parallelism' without expressing some point of view—*a* is parallel to *b* or vice-versa, etc.—but neither can anyone express a point of view in this respect without a parallelism being experienced. Conceptualization is in this sense constrained by actually experienced patterns. Now, applying this to integration, we state the following hypothesis: what is experienced as perceptually integrated is also conceptually integrated. To take a classical example, the dependency relation between color and extension, or—a case in point—the part-whole relation between a nail and a finger are such integrated experiences, which we then claim are also integrated in our conceptual representation of finger and nail (cf. Langacker (2001)). It is, as it were, an analytical experiential fact that a nail evokes as its immediate scope a finger or a toe (whereas the same thing does not hold for rats and malls). Whatever the neural mechanisms are for perceptual integration (binding), it seems reasonable to assume that they yield an integrated space at the conceptual level as well. In the case of 'mall rat,' at the experiential level there is an integrated correlation between the mall and the teenagers, at least for the language producer sitting in the mall. This correlation could have yielded something like 'mall youngsters,' but here we see the necessity of making a distinction between the perceptual and conceptual level because the language user might wish to evoke additional frames and schemas and blend them into the already integrated scenario. This might be done with the purpose of yielding a tighter integration of the experienced phenomenon or, as in the case of 'mall rats,' of yielding specific evaluating or pejorative imagery that would be difficult to render without recruiting other spaces.

To summarize the difference between 'fingernail' and 'mall rat,' we can say that in the first case we have an integrated experience that is also integrated at the conceptual level—i.e., it is not conceived of as consisting of two separate mental spaces. In the last case we also have an integrated experience as the base for the linguistic expression, but here additional frames are activated in order to produce a specific meaning, and so the expression is based on an integration of two different conceptual spaces. In short: *if an expression evokes two different conceptual spaces at the level of conceptualization, we have a case of blending; if it doesn't, we don't.* Now, on the other hand, what motivates the identity of the linguistic construction despite the different modes of cognitive meaning construction (with or without blending) is the fact that in both these types of cases the underlying formal structure remains the same: the *X*-term is a predicate of the *Y*-term.

In the following section, we will go more into detail with the issue of cognitive processing of compounded expressions. To this end, we present what we understand by event-frame and hereafter we show the ways in which it can be instantiated cognitively. This will allow us both to characterize cognitive processing (on the grounds of already established evidence) and to show how one simple frame instantiated by different types of cognitive computation can give rise to a wealth of apparently substantially different types of compounds.

5 Types of meaning construction

There exists a considerable number of compounds that display and elaborate *event frames*. By this we mean frames that schematically express or imply an act of some sort and therefore imply an agent, a result, an object/patient, and an instrument. In such compounds, the general, ‘vague’ frame is displayed by the *Y*-term (itself profiling one component element of the frame). The general frame is in itself underdetermined and likely to be specifically instantiated in many different ways.

In the following, we will describe two types of event frames as well as the very pervasive teleological frame for purpose-oriented action. These frames do not, of course, exhaust the list of event frames. Their analysis simply serves the double purpose of justifying the internal frame-schematic unity of compounds *and* of showing the *different kinds of cognitive operations* to which they can be subjected. A good description of compounds resting on event frames should therefore integrate observations about the different ways in which they are accessed cognitively. The different cognitive mechanisms we will examine are not specifically tied to language production, but serve general purposes useful to the cognizer.

The two event frames we will deal with are ones that as a minimum contain (1) an *agent*, an *act*, a possible *object/patient*, and a *result (goal)*;

(2) an *agent*, an *act*, an *instrument*, an *object*, and a *result*.

Our claim is now simply that given such frames, the focus (or the window of attention) can be placed on different constituent elements of the frames, yielding different aspects of one and the same basic frame.

5.1 Agent (Act (Patient (Result

Here (act)_n will refer to a nominal representation of the act. Consider ‘hunt’ or ‘hunting,’ both of which evoke the whole frame: there is an agent, there is a patient, and there is a goal, but they are not very rich in imagery; this can be supplied by integration with the object/patient, as in ‘bear hunting’ and ‘treasure hunt,’ which evoke very different images. It is generally the case that (act)_n evokes a full scenario, especially a goal, but at the same time it is also somewhat schematic in its meaning, lacking the full figurative content supplied by the object; object-(act)_n-compounds are therefore also a classification of the possible figurative specifications of (act)_n. It can be predicted that if (act)_n loses any specification of a goal, then the result must be mentioned, and so the integration must be achieved via the result, as, for instance, in ‘fire-raising.’ In the latter case, the verb is so schematic that it almost seems to be subordinated to the fire; however, the fact is that the fire is the result of a deliberate act that is the focus of attention, and this is the meaning contributed by the verb. Therefore, we can still justify that (act)_n is the focus of attention and that the result in this case is the integration into an event frame.

Let us now look at cases in which the specifying factor is the agent with the act as the focus of attention. Given the series agent (act (patient (result, it is clear that if there is a patient, then (act)_n must window both the result and the act in order to be able to integrate the whole series. There is a wealth of nouns with this property. Consider ‘bite’: it might refer to the act of biting as well as to the result, so in a compound like ‘flea bite’ we have a window to the agent, the act, and the result, and only the patient is gapped; yet, since the result requires a patient, it is implicitly represented. Conversely, if (act)_n does not window a result, there can be no patient either, that is, we have an intransitive act, as in ‘sun rising,’ ‘volcano eruption,’ etc.

Furthermore, suppose we focus on the result and specify it as the object or the agent. We then get examples that in the literature—for instance, in Hatcher (1960)—are considered cases in which *X* is the source of *Y*. This would go for ‘cigar smoke’ and ‘volcano ashes.’ Yet, if someone says: ‘how strange, I can smell cigar smoke in my office,’ then clearly the speaker implies the existence of an agent that can be held responsible for the misdemeanor. Instead of classifying according to a more abstract notion such as *source*, we suggest that integrated experienced events exist as motivations for these compounds, which then conversely fully activate the corresponding event-frames.

Consider now cases where the focus is on the agent. From the sequence above, we see that if *X* denotes the object/patient, we get a very well-integrated frame. A common pattern is ‘horse dealer,’ ‘chess player,’ etc. In such

examples, the *Y*-term is already an integration of the act and the agent: ‘deal-er,’ so we have in fact an integration of agent, act, and object in the compound.

Compounds manifest all possible combinations of this frame’s component elements, but given a specific event and a specific focus, one cannot use all elements as the specifying term. Which element takes the place of *X* is determined by the structure of the event and the type of focus. For instance, if the focus is on the intentional act, the result will be the specifying principle. This is also the case if we have a pure schematic act, i.e., if (act)_n has a schematic meaning with no goal implied. However, if (act)_n implies a goal, then the object will contribute the figurative integration, as in ‘bear hunting.’ If, on the other hand, (act)_n both implies the act and the result, then the agent will be the specifying factor, etc. In short, the logic of compounding within a single event frame is highly dependent on the type of verbal meaning activated by (act)_n.

5.2 Agent (act (instrument (object/patient (result/goal

Let us now look at a very productive frame in which we have an instrument, i.e., we have an "energy flow" diagram of the following sort: agent (act (instrument (object/patient (result/goal. According to the above principles, focus can be distributed over different component terms, and different component terms may correlatively specify aspects of the profiled event. If we focus on the instrument, almost any element in the energy string can be used for integrating the instrument into an event frame. Take ‘knife’ as an example: the Danish ‘slagterkniv’ (‘butcher knife’) takes the agent as the salient feature: this is a knife used *by* a butcher. ‘Meat knife,’ ‘fish knife,’ or ‘bread knife’ specify (as objects) ‘knife’ as an element of a scenario in which meat, fish, or bread are cut into smaller pieces. In the Danish compound *fileteringskniv* (lit. fileting knife), it is the act itself that specifies the frame as a predication of a specific way of cutting fish. Also the result can integrate the instrument as in ‘coffee machine,’ where ‘coffee’ refers to the final product of the process, or in ‘sleeping pill,’ etc.

If the object is the focus of attention, we have cases like ‘beef cattle,’ where the integrating term refers to the result. In this case it is only because of cultural knowledge that we are able to make a weak association to the full event frame (cattle is a cultural object implying a *cultivating* act, and the beef as the result). In the Danish compound *slagtekvæg* (lit. ‘slaughter cattle’), we have an example of integration with the act, although in this case it is a verb-noun compound. It is predictable that if there is focus on the object/patient, then the specifying term will mainly be (act)_n or the purpose, certainly not the agent (the instrument does not seem to be suitable for specifying the object).

The act is a frequent focus of attention, and it can be integrated with the instrument, the object, and the result. In ‘knife attack’ and the Danish *ovnstegning* (roasting, lit. oven frying), it is the instrument that integrates the event and provides (act)_n with richer imagery. In ‘pig killing’ it is the object and in ‘cake baking’ it is the result. Again, it is predictable that no integration with the agent can activate the whole frame unless in very contextually determined meanings. One can imagine a term like ‘Smith baking,’ meaning a special kind of baking that only Smith performs. But in general we can say that for Agent-(act)_n compounds the instrument, the patient, and the result are left unspecified, as in ‘peasant rising.’

The teleological frame of purpose-oriented action

A widely used event frame is the teleological frame of purpose-oriented action. We have already touched upon it above: it has the special merit that the ‘circular’ teleological structure (aiming at some purpose already present from the beginning) permits further ‘roles’ (or as we say in Europe, ‘actants’) to be made explicit if necessary (e.g., instrument, anti-subject, raw material, result (insofar as it differs from the intended result)). Thus, the teleological schema can be represented in a compound foregrounding two salient points of the schema in question, referring to one of the points (*Y*), and characterizing it by means of the other (*X*).

This yields the following overall structure: *X* refers to (part of) *Y*’s function, production, use, purpose, etc. Some examples are ‘house boat,’ ‘boat house,’ ‘war machine,’ ‘beer can,’ ‘can beer,’ ‘US army,’ ‘police station,’ etc.

Compounds exploiting this frame probably constitute the most comprehensive category of all compounds because the *X* of the construction refers to potentially any part or aspect of teleological processes, be it purpose (‘sleeping pill’), raw material (‘meat grinder,’ ‘salt mill,’ ‘lamb steak,’ ‘pig slaughter’), the process itself (‘fileting knife,’ ‘slaughterhouse’), the agent for the process (‘masterwork,’ ‘scout knife’), the tool used (‘pancake,’ ‘gun wound,’ but also with reference to energy source: ‘water mill’), what should be fought (the anti-subject of the process: ‘fire station,’ ‘error seeker,’ ‘insect poison’), or recognition of the result (‘prize question,’ ‘award winner’).

Conversely, the *Y* may refer to any aspect of the process as well: purpose (‘pill sleep’), raw material (‘input-data’), the process itself (‘pig slaughter’), the agent of the process (‘cod fisherman,’ ‘award winner’), the tool used (‘golf club’), the anti-subject (‘monster fire’), or the recognition of the result (‘butcher award’).

All in all, this points to the fact that *X* and *Y* may combine aspects of a teleological process freely. Behind this maybe surprising fact lies a detailed and well-ordered schema of teleological processes. Many authors have touched upon various aspects of such a schema. Consider, for instance, Lakoff's (1987) source-path-goal image schema as a basic structuring of all teleological (and hence functional) action, or Greimas's (1987) "narrative schema" taking a narrative molecule of action to comprise the following actants: a Destinator defining the aim of the process and selecting an agent to perform it, a Subject performing the act, a Helper instructing the Subject and giving him some effective Tool, an Anti-Subject trying to prevent the act, an Object that the Subject is supposed to acquire as a result of the act, and finally a recognition awarding (or punishing) the Subject for the result of the act.

The apparent confusion that may strike the eye when seeing the number of possible combinations in this category is highly reduced when we consider the fact that the schema of purposeful action is probably the most widespread schema of all in everyday cognition. Instantiations of this schema are pervasive in human culture, ranging from small, common-sense actions to the complicated chains of intentional actions performed by large sociological and political institutions. In this case, compounds have the effect of highlighting some aspect of a teleological process (the *Y*-term) with respect to some other aspect of the same process (the *X*-term). The apparent complexity in the construction is counterweighed here by the fact that both *X* and *Y* refer to the same underlying action schema. Thus, we can take one and the same *Y* (a mill) and make compound noun constructions referring to a whole series of schematic process slots: 'paper mill' (purpose), 'corn mill' (raw material), 'saw mill' (tool), 'water mill' (energy source), 'peasant mill' (agent), 'state mill' (destinator), 'grinding mill' (the process). The slots for anti-subject and recognition, respectively, seemingly have no natural use in this case, but we would immediately understand new compounds exploiting these slots: a description of Purgatory involving a 'sinner mill,' or the recognition of especially 'able master mills' would be perfectly understandable due to the underlying schema.

The core examples of 'fire station' and 'dolphin safe' analyzed above thus fit nicely into this description of the function schema, and we may outline a subtaxonomy of aspects highlighted as follows:

- 1) purpose
- 2) raw material
- 3) process itself
- 4) agent
 - a) direct: subject
 - b) indirect: destinator
- 5) tool used
- 6) object produced
- 7) anti-subject
- 8) result
- 9) recognition

In general, specific processes may be described at whatever fine-grained level the organization of the process requires. Lots of elements may be recruited: intermediate products, parts of machinery, lines of command in the work force, different raw materials, distinctions between different purposes of the same process, the occurrence of unforeseen anti-subjects, etc. Due to the (relatively) free combination of subcategories capturing aspects of this process, this gives rise to a number of subcategory combinations (in the vicinity of a hundred) that may seem confusing. They are nevertheless quite easy to process cognitively, because the particular compound prompts the canonical and simpler teleological schema as the common background for the specific variations. This was indeed what we saw in the cases of 'X station' and 'X-safe.'

6 Closing remarks

There is something almost paradoxical about calling into question the application of blending theory on the analysis of compounds. The latter does indeed seem to be the perfect grammatical counterpart to the conceptual integration of mental spaces. They combine two words, they do so without any grammatical marks specifying the combination, and they yield a meaning that cannot be retrieved from the component elements taken separately. In short, they are like linguistic epitomes of blends. What is more, since compounds are not only pervasive, but also invariant as to their form, it seems more than plausible to infer that the cognitive processing device in charge of their construal is also invariant.

For different reasons, we believe that this conclusion is wrong. On the contrary, we claim first that when the signification of a composite term is elaborated within one and the same conceptual frame, blending is not involved. This view implies further that we call into question the general tendency towards considering the partial contents cued by the respective components of, say, compounds as elements to be processed in the *same* way, having invariably the same semantic-conceptual status, and displaying hardly any internal constituent structure.

As already mentioned, there is indeed something self-evident about dealing with compounds in terms of blending. When we hear, for instance, ‘doghouse,’ we hear ‘dog,’ we hear ‘house,’ and we combine the two. Yet, this self-evidence is critically dependent on the very restricted theoretical viewpoint invariably taken by blending analysts: the ‘hearer’s point of view’, or the ‘problem-solving stance.’ In fact, blend analyses consider meaning construal related to compounds from the exclusive point of view of a hearer experiencing such expressions, and, what is more, consider it an interpretive problem pertaining exclusively to the level of linguistic expression, i.e., triggered by the mere fact that certain expressions are composite.

The shortcomings of this assumption become clear when, instead, we approach the issue from the point of view of the communicating person, assuming that what characterizes the *construal* of compounds also characterizes their *production* (otherwise we would have to create two departments for semantics, one for reception, another for the production of meaning). Seen from the recipient’s point of view it might seem obvious to use blending to solve the apparent riddle posed by a compound construction, but from the producer’s point of view, which must be ontologically prior to that of the recipient, it seems awkward to say, first, that the producer localizes a distinct and experientially completely integrated item in the world he wants to communicate something about—say, a doghouse; that next his cognitive system somehow recognizes that this item is linguistically expressed by a *complex* term, and, further, that the cognitive system—despite the integrated character of the experienced object, and because of the complexity of the linguistic expression—displays two disparate mental spaces (‘dog’/‘house’), and eventually ‘runs the blend’ in order, as it were, to know what it is speaking about.

The reason why blending analyses are led astray in this way is most probably that their point of departure is the linguistic phenomenon and, thus, the in many cases entirely contingent fact that the phenomenon is a composite expression (cf. ‘doghouse’ in American English vs. ‘kennel’ in British English). They seem, wrongly, to infer from the complexity of the expression to the complexity of the underlying experience and of the conceptualization that the expression evokes. Our point of departure is the opposite. In a standard cognitive linguistic way, we consider the linguistic level to be grounded in an experiential level. We therefore consider that the semantic contents of an expression should be defined in terms of the cognitive representation the expression evokes. This is the reason why we distinguish between semantic contents that evoke clearly experientially integrated phenomena—independently of their linguistic expression—such as doghouses, birthdays, coffee machines, beer cans, police stations, strawberries, fingernails, and streetlamps, and contents (perhaps triggered by the very same words, but in other, metaphoric contexts) that in some way or another involve mappings between two different conceptual frames.

This is why we prefer the present analytical framework: it provides accurate descriptions of single data; it adapts to general formal features of the linguistic expression; it analyzes on both the conceptual level and that of cognitive processing; it is valid for both the production and interpretation of meaning; it captures the different meanings an expression can take on while motivating its use through contrasting expressions, and, finally, it approaches the phenomenon with respect to the experiential, speech act-interactive, and intentional setting in which it occurs.

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