

All in a Day's Week¹

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0. Introduction

This paper presents a Frame Semantics analysis of calendric terms in English, Hebrew, and German, demonstrating the inextricable relationship between morphology and semantics. Here, we consider how Frame Semantics can be extended to morphological analysis.

Traditionally, the morpheme has been taken as the smallest unit of meaning in linguistic analysis, with generative word formation rules generating words from individual morphemes (Hockett 1954, Kiparsky 1968, Aronoff 1976, Scalise 1986). However, the traditional definition of morpheme is problematic when it comes to words containing parts that do not have meaning in isolation (so-called *cranberry*-morphs). For example, Bybee (1988: 128) and Waugh (1996: 257) point out that English weekday names consist of two parts, the morpheme *day* in combination with other units (e.g. *Mon-*, *Tues-*, *Wed-*), the latter of which do not encode meaning in isolation.² To overcome the theoretical problems associated with empty morphemes, Bybee's (1988) alternative model regards the morphological component of the grammar as part of the lexicon.

Section one of the paper discusses Bybee's (1988) morphological analysis of English weekday names within her storage and processing model. Section two takes Bybee's approach and applies its findings to the analysis of Hebrew and German weekday names. We show that Bybee's approach is problematic when applied to sets of weekday names that do not follow a coherent morphological pattern indicating their membership in the same class of semantically related words. In section three, we propose a frame semantic analysis, and show that a more detailed morphological analysis reveals information about the frame structure needed for the use and interpretation of weekday names in English, Hebrew, and German. We define the Calendric Unit frame with words that name the different parts of the calendric cycle, both man-made and natural. In addition, by employing the frame to organize and characterize the underlying conceptual structure of the Calendric Unit terms, we illustrate the efficacy of Frame Semantics for research in contrastive lexicology. Our discussion illustrates that a frame-semantic approach to morphology accounts for the "*cranberry*-morpheme problem" straightforwardly by not considering empty morphemes in isolation. Instead, we argue that *cranberry* morphemes become interpretable because of the background frame

¹ The authors are grateful to Abby C. Wright for comments and suggestions on an earlier version of this paper, and Olya Gurevich for bibliographical information.

² Note that diachronic aspects of the meanings associated with *Mon-*, *Tues-*, *Wed-*, etc. cannot be taken into consideration for a synchronic analysis in this context because speakers of modern-day English typically do not possess such knowledge. For an overview of the development of English and German weekday names, see, for example Gundel (1938), Strutynski (1975), Zerubavel (1985), Bammesberger (1999), and Grezega (2001).

against which they are set. Finally, in section four, we summarize our findings and suggest directions for future research for a frame semantic approach to morphosemantics.

1. Bybee's (1988) 'Morphology as Lexical Organization'

Traditionally, morphological analyses assume the morpheme to be the smallest unit of meaning, and investigate the structural patterns of combining morphemes to produce words (e.g., Spencer 1991). In this view, morphological rules and lexical representations are located in separate compartments of the grammar. Whenever new morphological forms are derived, a morphological rule is applied to a lexical representation (e.g., Kiparsky 1968).

In contrast, Bybee's (1988, 1995, 2001) storage and processing model proposes that morphology is a set of relations among words rather than a set of relations among morphemes. Her model sees morphology as crucial to the organization of the lexicon and recognizes the intimate connection between form and meaning.³ This approach assumes that "morphological rules and lexical representations are not separate from each other" (Bybee 1988: 125), rather they are both contained in the lexicon. The advantage of this approach is that the

...morphological facts of natural language are described in terms of independently necessary mechanisms of lexical storage: the ability to form networks among stored elements of knowledge and the ability to register the frequency of individual items and patterns. (Bybee 1988: 125)

At the core of Bybee's approach is the idea that there are "semantic parameters by which morphemes are organized", such as semantic fields, scripts, and lexical relations (1988: 125). Parallel to semantic organization, there are phonological connections that link stored forms. Bybee's model also includes information about the degree of relatedness among words, "which is primarily determined by the number and type of semantic features shared" (1988: 131). The strength of the connections between words captures word-frequency effects that research has shown to be crucial for lexical access (e.g. Bates & McWhinney 1987, Moder 1992).

Using this approach to the analysis of English weekday names, Bybee points out that *Monday*, *Tuesday*, *Wednesday*, etc., all contain the meaningful morpheme *day*. She characterizes the lexical relation between these words and the word *day* as follows:

With lexical connections we can associate the *day* sequence in these words with each other and the word *day* without requiring that the remainder of the word be meaningful. Rather the first syllable remains as part of the whole word, but it has no connections to other items. (Bybee 1988: 128)

A major advantage of Bybee's approach over traditional rule-based accounts is that it does not require every part of a word to contribute meaning. Phonological and semantic

³ Matthews (1991) and Stump (2001) also adopt a paradigm model.

similarity of part of a word (to other known words) is sufficient for interpreting unknown words and connecting a whole word to other semantically related forms. Having discussed Bybee's explanation of the distribution of English weekday names, we now examine how well her proposals fit the analysis of weekday names in other languages.

2. Weekday names in English, Hebrew, and German

A comparison of weekday names in English with those in Hebrew and German shows that each of the three languages exhibits a different pattern of naming, as seen in (1).⁴ As detailed above, English weekday names follow a regular pattern by employing the morpheme/word *day* to identify each day.

(1) Weekday Names

| | | | | | | | |
|---------|-----------|----------|-----------|-----------|------------|----------|----------|
| English | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| Hebrew | yom rišon | yom šeni | yom šliši | yom rvi'i | yom xamiši | yom šiši | šabat |
| German | Sonntag | Montag | Dienstag | Mittwoch | Donnerstag | Freitag | Samstag |

For the most part, Hebrew weekday names also follow a consistent pattern, namely the noun *yom* - 'day' followed by an ordinal number, as for example *yom šliši* (day third) - 'Tuesday'. Note, however, that *šabat* (Sabbath) - 'Saturday' does not fit the regular pattern. Similarly, in German we find a pattern in which there is much regularity - i.e. most weekday names use the morpheme/word *Tag* - 'day' to identify the day, and one exception: *Mittwoch* - 'Wednesday'. Because Bybee's model relies on relatedness of forms, exceptions - i.e. those words that do not fit the pattern - remain unaccounted for.

Further problems arise for Bybee's model because it does not account for the common semantic background structure against which weekday names are understood. This is important when it comes to the interpretation of the so-called irregular forms (e.g. German *Mittwoch* or Hebrew *šabat*). With the set of weekday names each language appeals to the concept DAY; except for German *Mittwoch* - 'Wednesday', these languages do not appeal to the concept WEEK. Moreover, only the Hebrew data provide an indication of the sequential ordering of the days, which is motivated by a system external to Calendric Units, namely ordered numbers. To explicate, we take the perspective of language learners encountering these words for the first time and consider what they might conclude about the overall structure of the week based on the names of the days.

When language learners encounter the word *Tuesday*, they might conclude that there is a relationship with *day*, as Bybee suggests. However, they do not know that there are six other days, totaling seven days in the week, or what position Tuesday has with respect to other possible days. Thus, nothing about the names of the days of the week in English reveals information about the position a day holds within the sequence of days in the week. As a consequence, it is also not possible to know which days precede and

⁴ While outside the scope of the present study, we note work on different naming patterns for weekday names in other languages of the world, specifically Brown (1989) which addresses the issue of lexical acculturation, as well as Zerubavel (1985) on the development of these words.

which days follow any particular day based on the name of that day. In short, the arbitrariness of these terms is manifest. Furthermore, while the concept DAY is explicit, its relation to a larger calendric structure is not. The English terms tell us nothing about WEEK.

German is similar to English in that it also exhibits a high degree of arbitrariness in naming the days of the week. Except for the word/morpheme *Tag* - ‘day’ that occurs in all but one weekday name, the terms are not transparent. German differs from English in that when language learners encounter *Mittwoch* (“middle of week”) - ‘Wednesday’ in isolation, they can conclude that there is a concept WEEK and that the named entity falls in the middle of it. However, there is no information provided about the concept DAY, that the named entity is a day, or that there are six other such entities in the week. The term *Mittwoch* is unique for following reasons: (1) it is the only weekday name whose literal meaning, given a morpheme for morpheme gloss, reveals nothing about being a day; and (2) it is the only weekday name that evokes the larger structure of which it is a part. In Bybee’s terms *Mittwoch* is closely related to *Woche* - ‘week’, and not to *Tag* - ‘day’.

The situation in Hebrew is worth comparison. For the most part, weekday names are highly motivated based on their ordered sequence of occurrence in the week. From the perspective of the language learner, most Hebrew weekday names evoke the concept DAY and reveal information about the position that the day holds with respect to the preceding days, but not about a larger structure such as WEEK. Much like *Mittwoch*, the Hebrew word *šabat* (Sabbath) - ‘Saturday’ constitutes an exception with no formal relationship to any other weekday name. Unlike *Mittwoch*, the term *šabat* does not make reference to any calendric unit. The so-called irregular way of naming the seventh day of the week reflects the significance that the culture attributes to the category *šabat*, and as such, the language has a special way for naming it.

All three languages have a certain degree of arbitrariness in the terms that name the days of the week, as apparent from the above discussion, with Hebrew exhibiting the greatest degree of motivation. Our interest in arbitrariness/motivation stems from the desire to substantiate the frame, against which the meanings of these terms are understood.

Such phenomena are beyond the purview of Bybee’s model which is based on a notion of phonological and semantic relatedness of words. A comprehensive account of the cross-linguistic data requires going beyond the surface formal relationships among the words and necessitates appealing to the underlying conceptual structures against which these words are understood. The following section presents an alternative approach to analyzing the organization of weekday names in English, Hebrew, and German. It first introduces Frame Semantics, and then gives a definition of the Calendric Unit Frame used to account for the distribution of weekday names in the three languages.

3. Frame Semantics and the Calendric Unit Frame

In the Frame Semantics (Fillmore 1982, 1985) approach to the study of the lexicon, the frame provides the basis for the organization of the lexicon. In this approach individual word senses, relationships between the senses of polysemous words, and

relationships among semantically related words are linked via the frame. In this conception of the lexicon, there is a network of hierarchically organized and intersecting frames through which semantic relationships between collections of concepts are identified. A *frame* is any system of concepts related in such a way that to understand any one concept it is necessary to understand the entire system; introducing any one concept results in all of them becoming available. In Frame Semantics, word meaning is characterized in terms of experience-based schematizations of the speaker's world - i.e. frames. It is held that understanding any element in a frame requires access to an understanding of the whole structure.

The notion can be exemplified with the Commercial Transaction Frame, whose elements include a buyer, a seller, goods, and money. The large set of semantically related verbs linked to this frame includes *buy*, *sell*, *pay*, *spend*, *cost*, and *charge*, each of which evokes different aspects of the frame. The verb *buy* highlights the buyer and the goods, backgrounding the seller and the money; *sell* highlights the seller and the goods, backgrounding the buyer and the money; *pay* highlights the buyer, the money, and the seller, backgrounding the goods, etc. Knowing the meaning of any one of these verbs requires knowing what happens in a commercial transaction, and, in a certain sense, also means knowing the meaning of all of them. The knowledge and experience structured by the Commercial Transaction Frame provide the background and motivation for the categories represented by the words. The words, that is, the linguistic material, evoke the frame; the interpreter invokes the frame.

A complete description of these and other Commercial Transaction verbs must also include information about their grammatical properties and the full range of syntactic patterns in which they can occur. What elements of the frame are realized as the subject of the verb, as its object, if there is one, and what will be the surface form of the other elements? Which of these elements are optional; which are obligatory? For instance, in *Carla bought the computer from Sally for \$1000*, the subject, *Carla*, is the buyer and the direct object, *the computer*, is the goods; both elements are obligatory. The optional backgrounded elements surface as oblique objects: *from Sally*, the seller, and *for \$1000*, the money. While *from* is the only preposition allowing the interpretation that *Sally* is the seller, other prepositions may be used for the money - e.g. *with*. Although grammatical information about the syntactic-semantic valence description of each verb is not specified in the frame, it is deducible from the rich descriptions of the different elements of the frame.^{5,6}

For the most part, work in Frame Semantics has focused on characterizing and accounting for lexical semantic phenomena, in the broadest sense, and specifically addresses syntactic phenomena particularly as it attends to the grammatical function of lexical items depending on their syntactic realization in sentences. The present study takes a new direction by considering morphosemantics in a Frame Semantic approach. More specifically, we take the idea of valence description on the syntactic level and apply it to the morphological level. We suggest that providing valence descriptions for the morphological structure of words resolves the *cranberry-morph* problem. First, we describe the Calendric Unit frame in order to provide the background structure against

⁵ The foregoing discussion of Frame Semantics was adapted from Petruck (1996).

⁶ See Fillmore (2003) for more detailed discussion of *valence*.

which these words are understood. Then, we illustrate valence descriptions for the morphology of the words under consideration here.

We characterize the Calendric Unit Frame as one with words that name the different parts of the calendric cycle, both man-made and natural. The weekday names, discussed above, illustrate a man-made cycle; names for parts of the day, e.g. *morning*, *afternoon*, *evening*, *night*, etc., exemplify a natural cycle. While man-made cycles have an arbitrary, but fixed, starting point, there is no *a priori* starting point for natural cycles. Only the imposition of a man-made cycle onto a natural cycle sets its starting point. In addition, the notion of relative time figures into the Calendric Unit frame, locating time with respect to an identifiable reference point. For example, in the expression *this coming Monday*, the modifying phrase *this coming* locates the time with respect to *Monday*. Moreover, the idea of an iterated sequence plays a role in our understanding of words in the Calendric Unit Frame. Our focus on the concepts DAY and WEEK is a reminder that the part-whole relationship also figures into this frame. While knowledge of both key concepts is required for the use and interpretation of these terms, the languages differ in the degree of motivation and idiosyncrasy with which the weekday names are realized lexically.⁷

In English weekday names the morpheme/word *day* is the only meaningful unit that gives information about the frame to which the larger word belongs. The word *day* subcategorizes for a specifying morpheme that makes more explicit the day to which the word refers. In the case of cranberry morphs such as *Mon-*, *Tues-*, *Wed-*, etc., *day* combines with the cranberry morph because it has an open slot on its subcategorization list. Assuming knowledge of the background frame, when cranberry morphs combine with *day*, they only contribute meaning about where a day is located with respect to its temporal sequence vis-à-vis other days of the week. Such information is structured in the frame, but not even addressed in Bybee's account. In contrast, when meaningful morphemes such as *Christmas* or *Independence* combine with *day*, they contribute their own meaning, since it is only the regular Calendric Unit frame that specifies the sequence of days. In the case of *Christmas*, for example, the morphemes combining with *day* help to locate a specific day being commemorated. Thus, the valence description of *day* includes grammatical information about its realization in combination with *cranberry*-morphs (e.g. *Mon-*) and independent meaningful morphemes. An analogous illustration can be offered for German: the morpheme/word *Tag* may be realized in combination with the bound morpheme *Mon-*, as in the name for the day of the week *Montag*, as well as with unbound morphemes, as in *Unabhängigkeitstag* - 'Independence Day' (where the underlined portion of the word is the free-standing noun meaning 'independence'). Similarly, in Hebrew the valence of *yom* allows the word to be realized in combination with ordinal numbers such as *šeni* - 'second', yielding forms like *yom šeni* - 'Monday', as well as with nouns such as *huledet* - 'birth', yielding Noun+Noun compounds such as *yom huledet* - 'birthday'. While the majority of Hebrew

⁷ While our description of the Calendric Unit frame may appear to be different from the one given in the FrameNet database (<http://www.icsi.berkeley.edu/~framenet>), the two are completely compatible. The focus of the present work is the morphological structure of weekday names, and not the larger constructions in which they or other terms linked to this frame occur (See Fillmore 2002 for an analysis of time-when expressions in English). As such, we have little more to say about the notion of Relative time here. In addition, since FrameNet has a separate Iteration frame, we have deliberately avoided saying that iteration is an element of the Calendric Unit frame.

weekday names are Noun+Adjective constructions, much of the general Hebrew lexicon can be characterized in terms of lexical items consisting of a (tri-consonantal) root and a pattern, as in *šabat* (Sabbath) - ‘Saturday’, consisting of the root *ŠBT*, which incorporates the notion of stopping or resting, and the nominal pattern CaCCaC. As such, the specifics of applying a Frame Semantic approach to a language with non-concatenative morphology remain to be determined.

We now consider the concept WEEK in the three languages being examined. Neither English nor German has a set of terms that structures the week. In contrast, for the most part, Hebrew weekday names provide information about the sequence of days in the week, knowledge of which is also structured in the frame. Next, we address the relationship between the concepts of DAY and WEEK. To illustrate, the German term *Mittwoch* (“middle of the week”) - ‘Wednesday’ is the only weekday name in the languages examined here which reveals nothing about being a day. Instead, it evokes the larger structure of which it is a part, WEEK. Finally, we note the influence of culturally significant categories on the naming and structuring of different parts of the week. For instance, Hebrew uses a special name for the seventh day of the week, *šabat* (Sabbath) - ‘Saturday’, where the language deviates from a regular and functional naming pattern. The word itself also evokes a resting frame, the Sabbath being a day of rest, a reminder that words may be linked to more than one frame at the same time. In a similar vein, English *weekend* and German *wochenende* - ‘weekend’ also show that languages lexicalize salient categories of experience in the culture, while at the same time illustrate the part-whole relationship (i.e. a weekend is part of a week). Knowledge about cultural conventions and practices is included in the description of the Calendric Unit Frame.

4. Summary and Directions for Future Research

In this paper we presented a Frame Semantics analysis of calendric terms in English, Hebrew, and German, demonstrating the inextricable relationship between morphology and semantics. In contrast to Bybee’s (1988) approach to lexical organization, we proposed to link and interpret semantically related words against a common background frame, namely the Calendric Unit Frame. The research presented here shows that the Frame Semantics approach to lexical semantics offers a unique way of capturing both generalizations and idiosyncrasies in the description of calendric terms. In addition, by employing the frame as an analytic tool, it is possible to include references to culturally significant categories in the lexicon. Moreover, taking the frame as a universal cognitive structuring device provides the apparatus for analyzing semantic fields both within and across languages, thus providing a perspicuous way of characterizing cross-linguistic differences.

Future research is required to investigate extending a Frame Semantic approach to morphology to analyze weekday names in other languages, as well as the relationships between weekday names and other terms linked to the Calendric Unit Frame. To illustrate, consider words for the temporal sequence of days *yesterday*, *today*, and *tomorrow*, along with their Hebrew and German counterparts, as well as day part names in all three languages (i.e. *morning*, *afternoon*, and, *evening*, *night*). The goals of the present paper have been more modest: to set out an investigation of how a Frame Semantics approach can be employed for the study of morphology. More specifically,

much the same way that a verb has arguments that instantiate frame elements, a morpheme may also require “arguments” to fill its frame slots.

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