Frequency adjectives as distributional modifiers

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1   Introduction

- Three different readings of frequency adjectives (FAs) (e.g. *occasional, daily, frequently*) (Stump 1981; Larson 1998; Zimmermann 2003; Schäfer 2007):

  (1)   **The internal reading** (termed the "deadverbial reading" by Stump):
         That claim was made by an occasional sailor.
         = That claim was made by someone who sails occasionally.

    – The FA typically modifies a deverbal, participant-describing noun.

    – The semantic effect of the FA is limited to the DP in which it appears.

    – A possible paraphrase of [FA N] is "N who/that V's/is V'd FA-ly".

  (2)   **The generic reading** (example from Stump 1981):
         An/The occasional beer is good for you.
         = Drinking a beer occasionally is good for you.

    – The [FA N] nominal can typically be paraphrased as an event description.

    – The nominal is (often) marked with a non-anaphoric definite determiner.

  (3)   **The adverbial reading** (first observed in Bolinger 1967):
         An/The occasional sailor strolled by.
         = Occasionally, a sailor strolled by.

    – The FA seems to scope outside of the nominal it occurs in, over the entire sentence.

    – The nominal is (often) marked with a non-anaphoric definite determiner.

- Two approaches to the the apparent wide scope of the FA under the adverbial reading:

  – Adverbial FAs as determiners that quantifies over event-individual pairs (see Stump 1981; Larson 1998; Zimmermann 2003, though these proposals differ in matters of detail)

  – Unified, adjectival semantics for all uses of FAs (Schäfer 2007; Gehrke and McNally 2011)

- This talk: None of the existing analyses of FAs accounts for all of their puzzling behavior.

  – An adjectival analysis is preferable (in line with Schäfer, Gehrke and McNally).

  – A completely unified analysis of FAs is *not* possible (contra Schäfer, Gehrke and McNally):

    ∗ Differences in sortal selectivity: temporally vs. non-temporally distributing FAs

    ∗ Some but not other FAs can be used predicatively.

  – Why the differences have gone unnoticed in previous work:

    ∗ Too much weight has been given to paraphrase as a diagnostic for the semantics.

    ∗ The model for the entire class is commonly *occasional*, which is rather exceptional, as it is the only FA that allows both temporal and non-temporal distribution.

  – Nevertheless, our analysis supports two of our previous key claims:

    ∗ Kinds can be realized by *sets* of tokens, not just by single token individuals.

    ∗ Some sentences constitute descriptions of event *kinds* rather than event *tokens*.

2 Empirical observations

- Different types of FAs in previous analyses: Fixed vs. relative (in)frequency
  (e.g. *daily*, *weekly* vs. *occasional*, *(in)frequent*)

- New division in this paper: **Temporal**(ly distributing) vs. **non-temporal**(ly distributing) **FAs**

  - Non-temporal distribution (discussed in Stump (1981): The individuals in question can be temporally co-located as long as they are properly distributed over some other sort of contextually-identified domain (typically space) ((4a)).
  - This interpretation is not possible with the FAs in (4b), which only allow for temporal distribution, a fact not observed by Stump.

  (4)   a.   The occasional/odd/rare sailor is 6 feet tall.
          b. ??The weekly/frequent/infrequent/periodic/sporadic sailor is 6 feet tall.

- Three types of nouns that FAs combine with:

  - EVENT NOUNS: eventuality-denoting nouns, e.g. *visit*, *swimming*, *discussion*
  - PARTICIPANT NOUNS: participant-denoting nouns, e.g. *recipient*, *sailor*, *employee*
  - SORTAL NOUNS: other nouns, e.g. *beer*, *car*, *chair*

2.1 The internal reading

- The internal reading appears with participant nouns (Schäfer 2007) ((5a,b)), but not with event nouns ((5c)) oe sortal nouns ((5d)).

  (5)   a.   A frequent sailor won the regatta. = one who sails frequently
          b.   A frequent recipient of awards took the Rotary Club prize again.
                 = one who frequently receives awards
          c.   A frequent visit $\neq$ a particular visit that happens frequently
          d.   A frequent letter $\neq$ a particular letter that Vs/is V'd frequently

- The nominal describes an individual whose identity is stable across the events that support the applicability of the FA; the FA specifies the frequency with which the nominal description holds of the individual it describes.

  $\rightarrow$ Pragmatically implausible for sortal nouns: Normally there is no temporal limit or frequency under which a nominal description holds of an individual.

  $\rightarrow$ Not possible with event nouns that describe token events: A token event occurs only once in time, and thus will not be manifest on multiple occasions.

- The internal reading is available with all kinds of FAs, except for *odd* and *rare*:

  (6)   a.   a daily/weekly Internet user = one who uses the Internet daily/weekly
          b.   a frequent/infrequent/sporadic/periodic visitor = one who visits frequently/etc.
          c.   a(n) occasional reader of the newspaper = one who reads the newspaper occasionally
          d.   an odd visitor $\neq$ one who visits oddly/on odd occasions
          e.   a rare writer $\neq$ one who writes rarely

- There are no determiner restrictions:

  (7)   A/Some/One/The/That/Each frequent sailor I know owns his own boat.

2.2 The generic reading

- This reading is possible with all kinds of FA-noun combinations (Stump 1981; Schäfer 2007).

- Typically, the NP is an argument to a generic predicate ((8)).

  (8)   a.   A(n) monthly/frequent/occasional check-up is essential.
            b.   A(n) yearly/infrequent/rare visitor is not a problem.
            c.   A daily/sporadic cup of coffee is harmless.
            d.   The odd/rare glitch is tolerable.

  - Stump: The FA can be substituted by a postnominal modifier such as *now and then, from time to time*, and *every day*; the same point is made by (9).[1]

  (9)   a.   A check-up on a monthly/frequent/occasional basis is essential.
            b.   A visitor on a yearly/infrequent basis is not a problem.
            c.   A cup of coffee on a sporadic basis is harmless.
            d.   A glitch on odd/rare occasions is tolerable.

  - With episodic predicates, the FA is either unacceptable or is not paraphrasable as in (9):

  (10)   a. ??An occasional cup of coffee has left circular stains on the table.   (Stump 1981)
            b.   The Premier Division-based Scotland side were only beaten, in fact, by a goal of almost tragic proportions, conceded when an infrequent error was characteristically punished by Riedle.   (BNC)
            $\neq$ An error on an infrequent basis was characteristically punished by Riedle.

  ⇒ Stump and this paper: The generic reading arises when the nominal is interpretable as generic independently of the presence of the FA.

- Two positions with respect to determiner restrictions:

  A. Stump (1981): The generic reading is compatibale with a full range of determiners:

  (11)   a.   No daily news program can match this one.
            b.   John agreed to conduct one weekly inspection a year.

  B. Schäfer (2007): The generic reading is compatible only with the definite and indefinite articles and semantically bleached possessives; cf. (12a) vs. (12b,c).

  (12)   a.   An/the/your occasional beer is good for you.
            b. ??Each occasional beer is good for you.
            c. ??Two/??Many occasional beers are good for you.

  - Examples of the generic reading involving other determiners are cases of quantification over kinds; e.g., the nominal in (11a) is equivalent to *No news program of the daily kind*.

→ Under this interpretation, the use of the FA in examples like (11) resembles in one important respect its use on the internal reading:

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[1] The sort of interpretation paraphrasable in (9) is only available for *odd* and *rare* in combination with the definite article and not with the indefinite article (see the contrast between (8d) and the following). We will return to this crucial point.

  (i) An odd glitch is tolerable. ($\neq$ The occurrence of glitches on odd occasions is tolerable.)

 (ii) A rare glitch is tolerable. ($\neq$ The occurrence of glitches on rare occasionals is tolerable; = The sort of glitch that occurs on rare occasions is tolerable)

- The latter entails that a property holds intermittently of an entity that is stable across time (e.g. an occasional sailor manifests the property of being a sailor occasionally).
- The examples in (11) entail that token instances are intermittently found / not found of a kind of event or object whose identity (as a kind) is stable across time.

- What the disagreement between Stump and Schäfer highlights is a difference in perspective concerning the source of the generic reading.

  - The cases that Stump unites under the generic reading share, in his view, a particular use of the FA that sharply contrasts with the adverbial use to be described in the next section.
  - Schäfer's discussion reflects the view that what makes the generic reading generic is the semantics of the nominal as a whole and not anything particular to the FA.
  - $\rightarrow$ These perspectives lead, respectively, to nonunified vs. unified analyses of FAs. (We will, in a sense, reconcile these views.)

- A new observation: The determiners are even more restricted than the literature has suggested.

  - *occasional*, *rare* and *odd* are much more natural with the definite article or bleached possessive than are the other FAs:

(13) a. ??The/??Your daily shower is good for you.
      b. ?The/??Your infrequent beer is good for you.
      c. ?The/??Your sporadic/periodic inspection is necessary.

2.3 The adverbial reading

Identifying the adverbial reading strictly by paraphrase raises several puzzles.

- Determiner restrictions:

  - Stump (1981), Schäfer (2007), Zimmermann (2003): The adverbial reading is only possible with the (in)definite articles and semantically bleached possessives ((14a)).
  - If, on the other hand, the examples with other determiners in (14b,c) are acceptable at all, they cannot be paraphrased by giving something like wide scope to the FA.

(14) a. We saw an/the/your occasional car on the road.
      b. ??We saw each occasional car on the road.
      c. ??We saw two/some/many occasional cars on the road.

  - Zimmermann: Since the quantificational force of the DP seems to come from the FA, only essentially pleonastic determiners are allowed on this reading.

  BUT: There are examples with other determiners that can also be paraphrased adverbially:

(15) a. I have seen some occasional television interviews with people who are electors.
          = Occasionally, I have seen some television interviews with people who are electors.
      b. There was some occasional mild violence and language and comic mischief.
          = Occasionally, there was some mild violence and language and comic mischief.

$\Rightarrow$ Paraphrase is not a reliable diagnostic for a specific reading.

  - First crucial observation: All of the exceptions we have found to the determiner restriction associated with the adverbial reading involve event nouns (see below).

- The adverbial reading is not systematically possible for all determiner-FA combinations.

  - It is available with *occasional* with either definite or indefinite article:

  (16) a. An occasional sailor strolled by.
            = Occasionally, a sailor strolled by.
        b. The occasional sailor strolled by.
            = Occasionally, a sailor strolled by.

  - It is possible with *odd* and with *rare* only with the definite article ((17), (18)).[2]

  (17) a. A(n) odd/rare sailor strolled by.
            ≠ Rarely/On odd occasions, a sailor strolled by.
        b. The odd/?rare sailor strolled by.
            = Rarely/On odd occasions, a sailor strolled by.

  (18) a. In Hinsonville, the rare family had just one parent, and that condition was usually quickly altered by the second marriage of the widow or widower. (Google books)
            = Rarely, a family had just one parent.
        b. she runs her family's Sea-Vue Motel and Restaurant on a patch of northern Florida coastline...that sees only the rare tourist.   (COCA)
            = Only rarely does the coastline see a tourist.

  - No other FAs with either definite or indefinite determiners allow the adverbial reading.[3]

  (19) a. An infrequent/frequent/sporadic/periodic sailor strolled by.
            ≠ Infrequently/Frequently/Sporadically/Periodically, a sailor strolled by.
        b. The infrequent/frequent/sporadic/periodic sailor strolled by.
            ≠ Infrequently/Frequently/Sporadically/Periodically, a sailor strolled by.

  (20) a. A daily/weekly/monthly sailor strolled by.
            ≠ Daily/Weekly/Monthly, a sailor strolled by.
        b. The daily/weekly/monthly sailor strolled by.
            ≠ Daily/Weekly/Monthly, a sailor strolled by.

⇒ The adverbial reading is less robust than has been taken for granted in the literature.

  - It is specific to a particular subset of FAs, namely *occasional, odd*, and *rare*.
  - The presence of the definite vs. the indefinite article has a crucial role to play.

- Differences between sortal nouns and event nouns:

  - In Gehrke and McNally (2011), we used examples such as those in (21) to defend the claim that even FAs like *frequent* allow for the adverbial reading systematically with event nouns.

  (21) a. The committee had frequent meetings.
        b. The group held a daily/weekly discussion session.
        c. The group was subject to infrequent/occasional/periodic/sporadic reviews.

  - Stump (1981, 224) provides the following examples for adverbial readings with FAs that express a fixed frequency, which also involve event nouns (his (30)-(33)):

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[2]Though we find (17b) a bit marginal with *rare*, we have found some corpus examples that appear to instantiate this reading with the definite article, such as those in (18).

[3]In the case of *frequent*, which has been claimed to be sensitive to plurality, even placing the noun in the plural does not help. There has been some dispute in the literature as to whether *frequent* allows the adverbial reading at all. Zimmermann (2003) (following Larson 1998) claims, contra Stump (1981) (see also Moltmann 1997; Schäfer 2007), that the adverbial reading is only possible with FAs of relative *in*frequency. Our position on this issue will become evident below.

(22) a. A yearly eclipse left the city in total darkness.
    = Yearly, an eclipse left the city in total darkness.
  b. Mary paid her friend a weekly visit.
    = Weekly, Mary paid her friend a visit.

There is reason to suspect that the compositional semantics of the examples in (21) and (22) is distinct from that in (3) (contra Stump 1981; Gehrke and McNally 2011):

- These FAs are sortally compatible with the individual described by the nominal, unlike (3) (e.g., a meeting can be frequent, but a sailor cannot be occasional).
- The lexical semantics of the FA is clearly temporal, unlike (3).
- Sentences like (22a) allow a reading under which there was a unique event of the sort described by the main predicate, and the FA provides ancillary information about the typical frequency of the sort of event described by the nominal it modifies.

⇒ The FA is an intersective modifier in these cases, unlike in the classic adverbial examples.

- Differences in the predicates to which the FA-containing nominal serves as argument:

  - In Gehrke and McNally (2011), we observed the (then puzzling) contrast between (23), which involve verbs of creation, and (24).

(23) a. She wrote frequent letters to her mother.
    = Frequently, she wrote letters to her mother.
  b. She baked frequent batches of cookies.
    = Frequently, she baked batches of cookies.

(24) a. ??She sold frequent batches of cookies.
  b. ??She read frequent books to her mother.

  - Note furthermore the contrast between (23) and (25).

(25) a. ??She baked frequent portions of potatoes.
  b. ??She baked frequent cookies.

 → (25a): When *bake* is not used in its creation sense but in a sense similar to *cook*, a fixed frequency adjective does not license the adverbial reading.

 → (25b): A verb of creation with a bare plural that is most naturally interpreted collectively, rather than distributively (such as *letters* in (23a)), does not license the adverbial reading.

⇒ The adverbial reading is possible when the atoms in the denotation of the (plural) entity described by the DP containing the FA are strictly homomorphic to unique events.

  - The relevant argument of the verb has to 1) satisfy the property that Krifka (1998) termed UNIQUENESS OF EVENTS and 2) strictly satisfy the property MAPPING TO EVENTS.[4]

    * The themes of the verbs of creation in (23) can participate in such events only once (uniqueness of events); unlike *sell* in (24a) or *bake* as used in (25a).
    * Created objects map in a strictly homomorphic way to the creation events that produced them; unlike the theme of e.g. *read* (you can re-read or skip passages).
    * The theme in (25b) is usually a plurality, whereas in (23a), it is not.

⇒ We will disconnect the explanation for the facts in (14)-(20) from that for the facts in (21)-(25).

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[4]See Krifka (1998) for definitions and further discussion. Note that verbs of consumption (e.g. *eat, drink*) behave like verbs of creation: the object goes out of existence and is consumed only once, and the relation between object and event is strictly incremental.

2.4 Changing the perspective: temporal vs. nontemporal distribution

- Recall (4), repeated in (26), which shows the contrast between the FAs that can be used to express nontemporal distribution and those that can only express temporal distribution (over events).

(26)   a.   The occasional/odd/rare sailor is 6 feet tall.
          b. ??The weekly/frequent/infrequent/periodic/sporadic sailor is 6 feet tall.

FA	internal	systematic adverbial	nontemporal	determiner gen. rdg.	determiner adv. rdg.
rare	N	Y	Y	the/*a	the/*a
odd	N	Y	Y	the/*a	the/*a
occasional	Y	Y	Y	the/a	the/a
daily, etc.	Y	N	N	??the/a	NA
periodic	Y	N	N	??the/a	NA
sporadic	Y	N	N	??the/a	NA
infrequent	Y	N	N	??the/a	NA
frequent	Y	N	N	??the/a	NA

Table 1: Empirical generalizations from sections 2.1-2.3

- The availability of the nontemporal reading correlates with the unavailability of the **internal reading**. ⇒ There must be something <u>temporal</u> about the computation of the internal reading.

- The availability of the nontemporal reading correlates with the systematic availability of the **adverbial reading** (i.e. with all sorts of nouns and all sorts of predicates).
  ⇒ The adverbial reading is <u>not temporal</u> in nature.

- Nontemporal FAs reject the indefinite article in favor of the definite article, temporal FAs prefer the indefinite article, whether the interpretation of the FA is generic or adverbial.

  - E.g. the FAs that disallow the nontemporal reading systematically resist the definite article on the **generic reading**, cf. (27) (as opposed to (28)).

(27)   a. *A daily sailor is 6 feet tall.
          b. A/??The daily shower is good for you.

(28)   a. The occasional/odd/rare sailor is 6 feet tall.
          b. The occasional/odd/rare shower is good for you.

⇒ There is something <u>different</u> about the generic nominals in which <u>nontemporal</u> FAs appear, versus those in which <u>temporal</u> FAs appear.

- The single exception is *occasional*, which shows properties of both across the board.
  ⇒ ***occasional* is ambiguous**.

- A new observation: Only FAs that allow the indefinite article on the generic reading (<u>temporal FAs</u>) can also be used as **predicates** with the relevant interpretation (cf. (29) vs. (30)).

(29)   a. A(n) weekly/infrequent/frequent/periodic/sporadic check-up is necessary.
          b. The check-up was weekly/infrequent/frequent/periodic/sporadic.

(30)   a. ??A(n) occasional/odd mosquito is harmless.
          b. ??The mosquito was occasional/odd.

$\Rightarrow$ Different FAs impose different sortal restrictions on the nominals they can be predicated of:

  – In indefinite DPs such as those in (29), the FA is acting as an intersective modifier.
  – In contrast, this cannot be the case in examples involving the definite article, as in (31).

(31)   The occasional/odd/rare mosquito is harmless.

- Interim summary:

  – A fully unified semantics for FAs is not possible.
  – The different readings do not line up with the paraphrase-based readings.
  – Whether one semantics or another is involved depends on the specific FA involved; these semantics cross-cut the internal/generic/adverbial distinction.

3 The proposal

- Natural language allows for reference both to token (ordinary) entities and events, as well as kinds of entities and events (as in Gehrke and McNally 2011).[5]

- We modulate reference to nominal kinds vs. tokens via a "layered" DP (Zamparelli 1995).

  – We take nouns to denote properties of kinds, as exemplified in (32a).
  – These are converted via inflectional morphology (which we introduce in (32b) via a syntactic Num(ber) projection) into properties of token entities.[6]

(32)   a. $[\![_{NP}[_{N}\text{car}]]\!]$: $\lambda x_k[\mathbf{car}(x_k)]$
        b. $[\![_{NumP}[_{NP}\text{car}]]\!]$: $\lambda y \exists x_k[\mathbf{car}(x_k) \wedge \mathbf{R}(y, x_k)]$

- Analogously, verbs can apply both to kind- and token-level individuals or eventualities:

(33) $[\![\text{strolled by}]\!]$: $\lambda x_\alpha \lambda e_\alpha[\mathbf{strolled\_by}(e_\alpha, x_\alpha)]$, where α ranges over both kinds and tokens.

- We adopt two important claims from Gehrke and McNally (2011), and modify them, integrating the (non)temporal distinction:

  – Kinds may be realized not only by single tokens but also by sets of tokens; the function of FAs is to impose conditions on the distribution of these sets of tokens at a given index.
    * Temporal FAs can do this either as modifiers or as predicates applied to either kind- or token plurality-descriptions ((34a,b) or (34c)).
    * Nontemporal FAs do this only as kind-level modifiers describing token entity (including event) distributions.

(34)   a.   The meeting was daily/weekly/monthly/periodic/occasional.
        b.   Meetings were periodic/sporadic/frequent/infrequent.
        c.   Her job changes were frequent.

  – The semantics of declarative sentences can involve existential quantification not only over event tokens, but also sometimes over event kinds.

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[5]This premise is by now widely accepted in the case of ordinary entities (Carlson 1977, being the classic reference), and though less commonly made in the case of events, it has roots e.g. in situation semantics (see Barwise and Perry 1983) and has gained currency in recent years (e.g. Landman and Morzycki 2003; Ginzburg 2005; Sailer 2010; Gehrke 2012).

[6]See e.g. McNally and Boleda (2004); Farkas and Swart (2003); Déprez (2005); Müller-Reichau (2011); Espinal and McNally (2011), and references cited there for related proposals; **R** is Carlson's (1977) realization relation, and we assume here that existential closure binds off the kind variable in the representation of the noun in (32), though an indexical approach could also be taken to valuing this variable.

3.1 Temporal distribution

- We propose the semantic representations for the predicative and predicate modifier versions of temporal FAs in (35a) and (35b), respectively (where α ranges over both kinds and tokens).

  (35) a. $[\![\text{FA}_{temp-pred}]\!]$: $\lambda e_\alpha[\mathbf{FA}_{temp}(e_\alpha)]$
        b. $[\![\text{FA}_{temp-mod}]\!]$: $\lambda P \lambda e_\alpha[P(e_\alpha) \wedge \mathbf{FA}_{temp}(e_\alpha)]$

- The satisfaction conditions for $\mathbf{FA}_{temp}$ (on both uses) when it applies to kinds and token (plural) individuals appear in (36a) and (36b), respectively.

  (36) a. $\forall e_k, i[\mathbf{FA}_{temp}(e_k)$ at $i \leftrightarrow \mathbf{distribution}(\{e : \mathbf{R}(e, e_k)$ at $i\}) = dist]$
        b. $\forall e, i[\mathbf{FA}_{temp}(e)$ at $i \leftrightarrow \mathbf{distribution}(\{e' : \mathbf{atomic\text{-}part\text{-}of}(e' < e)$ at $i\}) = dist]$

    – **distribution** is a function that yields the distribution *dist* of a set of entities at a given index i (with values like *high*, *low*, *daily*, etc.).[7]

    – A FA_{temp} is true of its argument at an index just in case the distribution of the set of realizations or atomic parts of that argument at the index is the distribution the FA requires.[8]

- The semantics in (35b) and (36a), and its effect in combination with a noun, is illustrated for (temporal) *occasional* in (37):

  (37) a. $[\![\text{occasional}_{temp}]\!]$: $\lambda e_k[\mathbf{occasional}_{temp}(e_k)]$
        b. $[\![\text{occasional}_{temp} \text{ downdraft}]\!]$: $\lambda e_k[\mathbf{downdraft}(e_k) \wedge \mathbf{occasional}_{temp}(e_k)]$
           $= \lambda e_k[\mathbf{downdraft}(e_k) \wedge \mathbf{distribution}(\{e : \mathbf{R}(e, e_k)$ at $i\}) = low]$

  Adding an intersective condition on the kind:

    $\rightarrow$ The FA creates a subkind, characterized by the distribution of the instances of the superkind and contrasted with other subkinds characterized by other distributions.

- The intersectivity of the semantics for the temporal reading distinguishes our analysis from previous ones and accounts for a couple of facts about which other analyses have nothing to say:

    – Temporal FAs occupy the postnominal position in Spanish, which is reserved for intersectively interpreted modifiers:

  (38) un problema frecuente   'a frequent problem'
        a problem frequent

    – Temporal FAs are correctly predicted to combine with other intersective modifiers of the same sort (event kind descriptors), in the way that intersective modifiers generally do:

        * They can coordinate with such modifiers ((39a)).
        * There is a certain freedom in the ordering of these modifiers ((39b)).

  (39) a. ...an occasional and brief downdraft will occur within the chimney...
        b. a brief, occasional downdraft = an occasional, brief downdraft
        c. a frequent and widely-recognized problem
        d. a frequent, widely-recognized problem = a widely-recognized, frequent problem

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[7]An index is understood here to be spatiotemporally more constrained than a possible world; otherwise, the satisfaction conditions imposed below will be too strong, for instance entailing that there are few sailors (in a given world) if it is true that an occasional sailor strolled by.

[8]The distribution function must guarantee that the members of the set be properly individuable and that the distribution be sufficiently regular (see Stump 1981; Zimmermann 2003; Schäfer 2007, for discussion). As the means by which this is guaranteed is not crucial to our proposal, we will not discuss the options further here.

- The output of modification by the FA can serve as the input to additional modification. $\rightarrow$ The denotation of the set of kinds denoted by the FA+N need not be unique.
  - $\ast$ E.g. *occasional downdraft* denotes a set of kinds of downdrafts whose extension might include brief downdrafts, cold downdrafts, etc.
  - $\ast$ This predicts the existence of examples such as (40) (from the BNC), where the bare plural containing the FA denotes a set of kinds of abnormalities with a low distribution:

(40)   A number of occasional abnormalities have been described, including cardiac defects, cleft lip/palate, scoliosis, genitourinary anomalies, and central nervous system anomalies.

  - Temporal FAs are in principle able to co-occur with a variety of determiners, as was observed in (11), repeated in (41):

(41)   a.   No daily news program can match this one.
       b.   John agreed to conduct one weekly inspection a year.

  $\rightarrow$ Since the set described by the nominal is a set of kinds, we capture Schäfer's intuition that when a determiner other than a generic determiner appears with an FA, it is doing something like quantifying over kinds.

- When a kind description containing a temporal FA combines with Number, we get a description of token individuals of a kind whose distribution is determined by the FA:

(42) $[\![_{NumP} \text{occasional}_{temp} \text{ downdrafts}]\!]$:
       $\lambda e \exists e_k[\textbf{downdraft}(e_k) \wedge \textbf{occasional}_{temp}(e_k) \wedge \textbf{R}(e, e_k)]$

3.1.1   Accounting for the internal reading

- The internal reading requires a participant noun or a "stage noun" (cf. Barker 1999).
  - These nouns have an additional event (kind) argument in their semantic representation (see e.g. Winter and Zwarts 2011).
  - The representation of a noun like *sailor* is given in (43a), which is converted into a property of token individuals via the introduction of number morphology, as in (43b).[9]

(43)   a. $[\![_{NP}[_N\text{sailor}]]\!]$: $\lambda x_k \lambda e_k[\textbf{sailor}(x_k, e_k)]$
       b. $[\![_{NumP}[_{NP}\text{sailor}]]\!]$: $\lambda y \exists x_k, e_k[\textbf{sailor}(x_k, e_k) \wedge \textbf{R}(y, x_k)]$

- The FA combines with the noun before the latter combines with Number, as in (44b).[10]
  - Since the FA is sortally restricted to apply to events, the only option is for it to apply to the event argument in the noun's representation.
  - The exact mechanism via which the adjective accesses this argument is not crucial (see e.g. Pustejovsky 1995; Larson 1998; McNally and Boleda 2004, for suggestions).

(44)   a. $[\![_N\text{sailor}]\!]$: $\lambda x_k \lambda e_k[\textbf{sailor}(x_k, e_k)]$
       b. $[\![_{NP}\text{frequent sailor}]\!]$: $\lambda x_k \lambda e_k[\textbf{sailor}(x_k, e_k) \wedge \textbf{frequent}(e_k)]$

---

[9]Note that the existential closure introduced when Num is added will bind off the event kind variable in the noun's representation, in addition to the ordinary kind variable.

[10]This is much in the way that relational adjectives combine with kind descriptions before these are turned into token-level descriptions on the analysis in McNally and Boleda (2004).

- When Number is added, the result is a description of those token individuals of the sailor kind who participate in that kind of event that can be described as frequent sailing:

(45) $[\![_{NumP}\text{frequent sailor}]\!]$:
$\lambda y \exists x_k, e_k [\textbf{sailor}(x_k, e_k) \wedge \textbf{frequent}(e_k) \wedge \textbf{R}(y, x_k)]$

- Correct predictions of this analysis:

  – Expressions with such representations combine with any determiner (recall section 2.1).
  – Any token-level modification has to appear further away from the head noun than the FA.
    → It can only be added once a variable corresponding to the token individual is introduced by Number (see McNally and Boleda 2004, for related examples).

(46) a. Martin is a skilled frequent sailor.
      b. ??Martin is a frequent skilled sailor.

3.1.2 *The generic reading with temporal FAs*

- There are two kinds of cases: the modified noun describes an event or it does not.

- In both cases there is a very strong preference for the indefinite article or bare plural:

(47) a. A periodic inspection is important.
      b. Periodic inspections are important.
      c. ??The periodic inspection is important.

(48) a. A frequent glass of wine is healthy.
      b. Frequent glasses of wine are healthy.
      c. ??The frequent glass of wine is healthy.

  – The oddness of the definite article is exactly as when the FA is not present; e.g. the DPs in (49) lack a generic reading.

(49) a. The inspection is important.
      b. The glass of wine is healthy.

⇒ The oddness of (47c) and (48c) can be attributed to factors that are independent of the FA.

- The grammatical examples can be analyzed in the same way as other generic sentences involving indefinite singular and bare plural DPs; e.g. (47a):

  – We assume that the source of genericity in indefinite generic sentences is external to the subject DP and treat the indefinite as nonquantificational.[11]
  – The representation of (47a) is given in (50), where **Gen** represents a generic quantifier.

(50) $(\textbf{Gen}e_k : \textbf{inspection}(e_k) \wedge \textbf{periodic}(e_k))[\textbf{important}(e_k)]$

  – In prose, if e_k is an inspection kind of event whose instances are sets with periodic distributions, e_k is important.

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[11]See Farkas and Sugioka (1983); Cohen (2001); Greenberg (2002); Krifka (2013), among others, for different proposals. The question of how best to analyze indefinite and generic bare plural sentences has been the source of a long debate in the literature (see e.g. Carlson and Pelletier 1995; Mari, Beyssade, and Prete 2013, for overviews). To keep things simple, we will sketch a relatively primitive analysis that will serve to make our basic point.

- The representation of a sentence in which the generic operator combines with a NumP containing an FA, as in (42), is given in (51).

(51) $(\mathbf{Gen}e : \exists e_k[\mathbf{inspection}(e_k) \wedge \mathbf{periodic}(e_k) \wedge \mathbf{R}(e, e_k))[\mathbf{important}(e)]$

- – (51) does not have exactly the same satisfaction conditions as (50): it is true if, in general, a token inspection that qualifies as being of the periodic inspection sort is healthy.

- When the head noun does not describe an event, as in (48), coercion of the denotation to an eventuality description is needed.

  - – Examples in which temporal FAs modify sortal nouns are systematically equivalent to event descriptions in which an individual of the sort described by the noun is a participant:

(52)   a.   A daily beer is healthy.
            b.   V-ing a beer on a daily basis is healthy.

  - – This sort of coercion is well known (consider *enjoy the book*); our analysis is compatible with any independently-motivated account of coercion (see e.g. Asher 2011).

  - – Here we will simply use a function **E** to induce the appropriate coercion, yielding the denotation for (52a) in (53), which is fully analogous to (50).

(53) $(\mathbf{Gen}e_k : \mathbf{E(beer)}(e_k) \wedge \mathbf{daily}(e_k))[\mathbf{healthy}(e_k)]$

3.1.3 The adverbial reading with temporal FAs

- With these FAs, this reading is only systematically possible with event nominals ((54)).[12]

(54)   The department has undergone a periodic review (over the last 10 years).
            = Periodically, the department has undergone a review.

  - – As such sentences are not, as a rule, generic, there is no motivation for using a generic adverbial quantifier to bind the variable in the DP's denotation.
  - → The DP is an indefinite kind of the sort found in (55) (see e.g. Dayal 2004; Müller-Reichau 2011, for additional discussion and examples of indefinite kind nominals).

(55)   a.   A giant tortoise has recently become extinct.
            b.   Fred invented a pumpkin crusher.

  - – The denotation of the nominal in (54) is composed like for the generic reading ((56a)).
  - – When the indefinite article is added, the result is (56b).[13]

(56)   a. $[\![\text{periodic review}]\!]$: $\lambda e_k[\mathbf{review}(e_k) \wedge \mathbf{periodic}(e_k)]$
            b. $[\![\text{a periodic review}]\!]$: $f_i(\lambda e_k[\mathbf{review}(e_k) \wedge \mathbf{periodic}(e_k)])$

---

[12]Because of the complexity of the details that would have to be addressed, we will not consider the extension of the analysis we develop here to sortal nominals that satisfy the properties of Uniqueness of Events and Mapping to Events, illustrated in (23)-(25), leaving these for future research.

[13]For the sake of illustration we treat the resulting DP as denoting the entity returned by a choice function f_i on the set denoted by *periodic review* (Reinhart 1997; Kratzer 1998). Whether the choice function variable is treated as existentially quantified or as a contextually-valued free variable is not crucial here; we treat it as a free variable. Other analyses of the indefinite article would be compatible with our treatment of the FA.

Note that the DP containing the FA can also be understood as denoting a token review of the periodic kind. If the DP were to be interpreted this way in (54) the sentence would entail only that the department had undergone one token review, rather than a set of reviews.

- Because of the distribution condition on the set of tokens that realize this kind, it is difficult to imagine how any such set could participate in one token event of the sort described by the verb.

    - However, nothing would prohibit it from participating in the *kind* of event described by the verb, if the latter could be instantiated by multiple tokens.
    - → Sentences with the adverbial reading correspond to propositions about event kinds.
    - The denotation of (54) is represented as in (57), where **d** stands for *the department*.

    (57)   〚The department has undergone a periodic review〛:
    $\exists e_k[\mathbf{undergo}(e_k, \mathbf{d}, f_i(\lambda e'_k[\mathbf{review}(e'_k) \wedge \mathbf{periodic}(e_k)))]$

- The satisfaction conditions for sentences that are used to make assertions about event kinds:

    - In order for an event kind to exist at some index i, at least one realization of the event kind should exist at i; this is formalized in (58).

    (58) $\forall e_k, x, P, i[P(e_k, x) \text{ at } i \leftrightarrow \exists e, x[\mathbf{R}(e, e_k) \wedge P(e, x) \text{ at } i]]$

    - In most cases, the realization of an event involving kind-level participants will entail the existence of at least one realization of those kind-level participants:

    (59) $\forall e, x_k, i[P(e, x_k) \text{ at } i \leftrightarrow \exists x[\mathbf{R}(x, x_k) \wedge P(e, x) \text{ at } i]]$

    - For a kind with a set-of-tokens realization (e.g. (56b)) to participate in a kind of event that is subject to (59), each element of the set that realizes the kind should participate in a token event of the relevant event kind.
        * As the set of token entities needs to satisfy a particular distribution, the corresponding token events will also satisfy that distribution.
        * This is represented in (60), where x_k is understood to range over just those kinds realized by sets of tokens and X is the set of tokens that realize x_k at i.

    (60) $\forall e_k, x_k, i, X[P(e_k, x_k) \text{ at } i \leftrightarrow$
    $[\forall x \in X \exists e[\mathbf{R}(e, e_k) \wedge P(e, x) \text{ at } i]]]$

    - → For (57) to be true, there has to be a set of token review-undergoing events with a distribution that can be described as "periodic".

- Why temporal FAs do not yield the adverbial reading in combination with sortal nouns:

    - The noun does not describe the sort of entity that the FA can modify.
    - Only if coercion of the noun into an event noun is independently called for, temporal FAs are possible with sortal nouns:

    (61)   We enjoyed a daily/frequent beer with our friends.
    = Daily/frequently, we enjoyed (having) a beer with our friends.

3.2 Nontemporal distribution

- The semantics for nontemporal FAs is identical except for two details:

    - Nontemporal FAs are not sortally restricted to describing event distributions.
    - Nontemporal FAs lack a predicative use. → They are always predicate modifiers.

- The general semantics for nontemporal FAs is schematized as in (62a).

- The satisfaction conditions for nontemporal FAs are the same as those for temporal FAs (compare (62b) with (36a)).
- We exemplify this semantics, again using *occasional*, in (63).

(62) a. $[\![FA_{nontemp}]\!]$: $\lambda P \lambda x_k [(\mathbf{FA}(P))(x_k)]$
      b. $\forall P, x_k, i[(\mathbf{FA}_{nontemp}(P))(x_k)$ at $i \leftrightarrow$
          $[P(x_k) \wedge \mathbf{distribution}(\{y : \mathbf{R}(y, x_k)$ at $i\}) = dist]]$

- We exemplify this semantics, again using *occasional*, in (64).

(63) a. $[\![occasional_{nontemp}]\!]$: $\lambda P \lambda x_k [(\mathbf{occasional}_{nontemp}(P))(x_k)]$
      b. $[\![occasional_{nontemp} \; car]\!]$: $\lambda x_k [(\mathbf{occasional}_{nontemp}(\mathbf{car}))(x_k)]$
      c. $\forall x_k, i[(\mathbf{occasional}_{nontemp}(\mathbf{car}))(x_k)$ at $i \leftrightarrow$
          $[\mathbf{car}(x_k) \wedge \mathbf{distribution}(\{y : \mathbf{R}(y, x_k)$ at $i\}) = low]]$

- Correct predictions of this analysis:

  - Nontemporal FAs do not coordinate with intersective modifiers:

(64) a. *The museum had the odd/rare and brief visit from school groups.
      b. *The occasional and fast car drove by.

  - Changing the order of these FAs with respect to other modifiers produces a corresponding change in interpretation, something typical of predicate modifiers:

(65) Only the odd/rare/occasional 2-door car will have enough leg room in the back seat.
      $\neq$ Only the 2-door odd/rare/occasional car will have enough leg room in the back seat.

  - If nontemporal FAs have a different semantics and semantic type from temporal ones, this may explain why the two types of FAs have different distributions in different languages.
    * Spanish seems to lack nontemporal FAs (so does German, see appendix):

(66) *Pasaba el   {ocasional coche / coche ocasional}.
      passed the occasional car   car   occasional
      Intended: 'The occasional car passed by.'

- How the predicate modifier semantics accounts for the determiner restrictions:

  - The noun that the FA combines with denotes a set: the set of kinds described by that noun.
  - This kind description can be narrowed (which reduces the set of subkinds it denotes) by adding subkind-creating modification (e.g. *2-door* in *2-door car*).
  - $\rightarrow$ Whenever the kind description is converted to a description of tokens, there is always only one unique kind that the tokens are entailed to be realizing, namely the maximally general kind described by the nominal.
    * E.g., *cars that we saw*: the set of token individuals that we saw that are of the car kind
    * It may be that all of these cars belonged to one particular subkind of car, but no entailments to that effect are part of the semantics of the modified nominal.
  - $\rightarrow$ Though we cannot provide a deep answer as to why this uniqueness effect arises, it is an obvious consequence of having to choose some kind for the tokens to stand in the realization relation to, and natural language does not seem to be able to express at once, with a single, noncoordinated nominal, multiple realization relations.[14]

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[14]Of course, if some token realizes a given kind, it will realize all superkinds of that kind by entailment, but this is not relevant to our point.

- – Although the effect of adding a (nontemporal) FA is not to convert a kind-level description to a token-level description, its effect is similar insofar as it takes a kind description and imposes conditions on the realizations of the corresponding kind.
  - ∗ In order for those conditions to be met, the identity of the kind that participates in the realization relation must be established.
  - ∗ It is the unique, most general kind described by the nominal the FA combines with, for the same reasons sketched immediately above.
  - → When the FA combines with a kind description, it returns the description of the unique kind upon whose realizations conditions are being imposed.
  - → Nominals containing these FAs should reject any determiner that does not entail uniqueness, hence the restriction to *the* and the bleached possessive.[15]

- The representation for a DP containing a nontemporal FA:

  (67) $[\![$the occasional car$]\!]$: $\iota x_k[(\mathbf{occasional}_{nontemp}(\mathbf{car}))(x_k)]$

- It follows from this semantics that we do not get the internal reading with nontemporal FAs:
  - – The internal reading arises when the FA intersectively modifies an internal event argument within the representation of a nominal.
  - – Nontemporal FAs cannot do this, as they apply to descriptions of (kinds of) individuals, rather than to (kinds of) individuals themselves.

- The generic and adverbial readings are accounted for as with temporal FAs.
  - – The only difference is that the kind term contributed by the nominal containing a nontemporal FA has a unique denotation, but this does not affect the semantic type of the nominal.
  - – Once the nominal's semantics has been composed, the rest of the semantics of the sentence can be composed in the same way as with temporal FAs, modulo the fact that the kind variable in the denotation of the nominal is not available for binding e.g. by a generic adverbial operator.
  - – For example, (68b) shows the representation for the generically-used FA in (68a).

  (68)   a.   Max hates the occasional headache.
                  (= Max hates headaches that occur on an occasional basis)
            b. $\exists e[\mathbf{hates}(e, \mathbf{m}, \iota x_k[(\mathbf{occasional}_{nontemp}(\mathbf{headache}))(x_k)])]$

  - – In prose, (68b) states that Max hates that kind of thing that is a headache, realized by a set of tokens with a low distribution.

- A representation for the generic reading involving coercion of the nominal appears in (69), analogous to that in (53).

  (69)   a.   The occasional beer is healthy. = V-ing a beer on an occasional basis is healthy.
            b. $\mathbf{healthy}(\iota e_k \mathbf{E}(\mathbf{occasional}_{nontemp}(\mathbf{beer})(e_k)))]$

  - – (69b) states that the kind of event that is a beer V-ing, realized by a set of events with a low distribution, is healthy.

_____

[15]Insofar as the singular demonstratives *this* and *that* also entail uniqueness, we expect to find examples where they occur with nontemporal FAs. This prediction is in fact borne out:

(i) This product is great for pickups, vans and that odd car that comes in the shop.

- Sentences in which the FA manifests the adverbial reading, like (3) (repeated in (70a)), will be represented as in (70b).

(70) a. The occasional sailor strolled by.
      b. $\exists e_k[\textbf{strolled\_by}(e_k, \iota x_k[(\textbf{occasional}_{nontemp}(\textbf{sailor}))(x_k)])]$

  – The account of the specific entailments of (70b) is identical to that for sentences like (57).
  – The only difference is that the kind description in (70a), unlike the indefinite kind description in (57), picks out a unique kind.

- Combining a nontemporal FA with NumP:

(71) $[\![_{NumP} \text{FA}_{nontemp} \text{ N}]\!]$: $\lambda x \exists x_k[\textbf{FA}_{nontemp}(\textbf{N}))(x_k) \wedge \textbf{R}(x, x_k)]$

  – (71) denotes the set of token individuals that are realizations of the kind **N**; this kind is realized by a set of tokens with a particular nontemporal distribution.
  – This looks close to the use of FAs that we find in expressions such as the following:[16]

(72) a. He found some odd change in his pocket.
      b. She had nothing left except a few odd pieces of furniture.
      c. They held several odd jobs over the course of the summer.

⇒ All of the uses of nontemporal FAs discussed in the literature can be accounted for with one basic semantics, just as was the case with the temporal FAs.

  – The most significant difference between the two is that temporal FAs have an intersective semantics, while nontemporal ones do not.
  – This difference accounts for several differences between the two classes of FAs.
  – The different readings attributed to the FA are a byproduct of other elements in the sentences in which they occur.

3.3 Puzzles solved by distinguishing temporal and nontemporal distribution

- The determiner restrictions on the generic and adverbial readings

- The lexical restrictions on the combinatorial possibilities of different kinds of FAs with different kinds of nouns and the respective restrictions on the availability of particular readings:

  – The internal reading only involves temporal FAs because only these FAs have the right sort of semantic type to effect the modification associated with the internal reading.
  – The adverbial reading (i.e., the paraphrasability by a sentential adverb) is accounted for in different ways depending on whether the FA is temporal or nontemporal.

- FAs resist combining with mass sortal nouns, in contrast to mass event nouns, as shown in (73).

(73) a. ??There was occasional beer.
      b. There was occasional trouble.

  – Following McNally (1992), we assume that the postverbal nominal in an existential sentence contributes a description of token entities.
  – (73) shows that nominals containing nontemporal FAs cannot be converted to descriptions of mass entities, a generalization consistent with the anomaly of the sentences in (74).

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[16]Note that although (72c) might be considered an idiomatic expression, it presumably originated compositionally.

16

(74) a. ??There was odd trouble.
      b. ??There was odd beer.

  – However, we have already seen in (72a) that this generalization is not exactly correct; we add other attested examples:

(75) a. Most people who advertise on Craigslist are moving or found some odd furniture in their basement that they had forgotten about.
      b. The Goodwill nearby has bins full of odd silverware, only sorted by forks, knives, and spoons, and you can buy as little or as much as you like.

  – These acceptable examples are different from (74): only the mass nouns in the acceptable examples describe masses with naturally identifiable minimal parts (see e.g. Gillon 1992).

  – We suspect that a full account is related to the observation made in section 2.3 in relation to the contrast between (23b) and (25b), repeated in (76):

(76) a. ??She baked frequent cookies (vs. $\sqrt{}$frequent cakes).
      b.   She baked frequent batches of cookies.

⇒ With nontemporal FAs there is a requirement of a strictly homomorphic mapping between the entities whose distribution is being characterized and the eventualities in which they participate.

  – Mass nouns that describe entities lacking natural minimal parts do not provide the right sort of individuation conditions.

  – In contrast, temporal FAs (e.g. (73b)) characterize the distribution of eventualities directly, rather than via the individuation of individuals who participate in those events.

4 Conclusion

• FAs fall into two classes: temporal vs. nontemporal distribution.

  – This new observation has led to an analysis that solves a number of puzzles that previous analyses failed to explain.

  – The differences between nontemporal and temporal FAs are attributable to the fact that the latter are intersective modifiers sortally restricted to events, while the former are not.

  – Though the analysis defended here does not present a fully unified treatment of FAs, it does provide a unified analysis of each individual FA, with the exception of *occasional*, which we have argued is ambiguous.

• Future research:

  – Apply this sort of analysis to other adjectives that have not previously been associated with FAs; some candidates of this sort include *typical* and *usual*:

    * These might be the counterparts to *odd* and *rare* that would convey nontemporal *frequency*, rather than *infrequency*, in distribution.
    * This would render the class of nontemporal adjectives semantically more complete.

  – Explore the possibility of previously unrecognized strategies for conveying the sort of information typically attributed to (quantificational) determiners

  – Possibility of reanalyzing so-called quantificational adverbs such as *frequently* or *occasionally* along similar lines, as predicates of event kinds described by clauses

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A   Some remarks about German

- German FAs appear to allow only temporal distribution.

    - The FA uses of *odd* and *rare* translate with temporal expressions only, namely *gelegentlich* 'occasional' and *selten*, which is cognate with *seldom*.

    - Nontemporal interpretations of the English kind are impossible with *gelegentlich*:

(77)   *Ein gelegentlicher Matrose ist 2 Meter groß.
        an occasional   sailor   is 2 meters tall
        Intended: 'An occasional sailor is 6 feet tall.'

    - The adverbial interpretation of the classical example is unacceptable ((78a))[17], whereas an internal reading is possible with participant nouns ((78b)).

(78)   a.   *Ein gelegentlicher Matrose schlenderte vorbei.
             an occasional   sailor   strolled   by
             Intended: 'An occasional sailor strolled by.'
        b.   Ein gelegentlicher Radfahrer schlenderte vorbei.
             an occasional   bike-rider strolled   by
             'Someone who occasionally bikes strolled by.'

- Instead of the classical example in (78a) Zimmermann (2003) uses the example in (79a) (his (27a)) to exemplify the adverbial reading in German.

    - He argues that only FA-noun-combinations in subject but not in object position allow for the adverbial reading ((79b-d), his (27b-d)).

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[17]Note that German *Matrose* 'sailor', unlike its English counterpart, is not morphologically derived from a verb like 'sail', and thus does not allow the internal reading, so the ambiguity of the English sentence does not arise. Furthermore, according to Bücking (to appear), this sentence is grammatical in German, but the native speakers we consulted, as well as the German author of this paper, reject this sentence.

- He takes this as support for the determiner analysis, according to which the FA undergoes QR, which is not possible out of object position in German (unlike in English).

(79) a. Ein gelegentlicher Kunde   betrat   den Laden.
      an occasional   customer entered the shop
      'Occasionally, a customer entered the shop.'
   b. #PAGAD zerstörte   das gelegentliche Gebäude.
      PAGAD destroyed the occasional   building
   c. #Peter schickte einer gelegentlichen Frau   Blumen.
      Peter sent   an   occasional   woman flowers
   d. #Wir stoppten bei dem gelegentlichen Rasthaus.
      We stopped   at the occasional   roadhouse

- We consulted German native speakers about such examples:

  - In line with Zimmermann, all unanimously rejected examples like (79b-d).
  - However, only 7 of 11 accepted (79a).
    * Only one of those clearly allowed for the adverbial reading.
    * The other six allowed this sentence under the internal reading only.[18]
    * E.g., these speakers all accepted the discourse in (80), while the speaker who got the adverbial reading for (79a) did not.

(80) Ein gelegentlicher Kunde   betrat   den Laden. Er hatte rote Schuhe an.
     an occasional   customer entered the shop   he had   red shoes   on
     'An occasional customer entered the shop. He was wearing red shoes.'

⇒ Contra Zimmermann, the adverbial reading is not reliably available for (80a).

- German resembles English in that examples like (21) and (22) *are* acceptable, as in (81).

(81) a. Die Gruppe hielt eine tägliche / wöchentliche Diskussionsrunde ab.
        the group   held a   daily   / weekly   discussion-session off
        'The group held a daily/weekly discussion session.'
   b. Das Seminar   war seltenen   / gelegentlichen / periodischen / sporadischen
        the department was infrequent / occasional   / periodic   / sporadic
        Prüfungen   unterworfen.
        reviews.DAT under-thrown
        'The department was submitted to infrequent/occasional/periodic/sporadic reviews.'

  - In section 2.3 we suggested that although such examples have been claimed in previous literature to involve the adverbial reading, we suspect that the similarity to the classic example of the adverbial reading is only superficial.

- We have to leave the analysis of the German data for a future occasion, but the comparison with English clearly indicates that the temporal/nontemporal distinction within FAs is fundamental.

  - We expect that the analysis we propose for temporal FAs in English extends to German, whereas German simply does not allow nontemporal interpretations for FAs.
  - This sort of variation is unsurprising if the different readings are fundamentally a function of the individual FAs in the lexicon, as lexical inventories vary from language to language.

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[18]We concluded that they accepted the internal reading only, since it was supported by spontaneous responses such as 'ok under the reading where this is someone who is a customer occasionally', or 'ok in marketing contexts, where customers are divided into regular, occasional, and one-time customers'.