

Multiple event readings and *occasional*-type adjectives

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1 Introduction

Frequency adjectives (FAs) like *daily*, *frequent*, *rare*, *occasional* intuitively express that the entity they modify or predicate over is distributed in a particular way, usually over some stretch of time (but see (2-b)). Given the close connection to time, they commonly give information about the distribution of an event in time, as in (1).

- (1) a. They underwent a frequent check-up.
- b. A daily beer is good for you.
 ~ Drinking a beer on a daily basis is good for you.

In (1-a), the nominal *check-up* is an event noun and *frequent* specifies that the distribution of check-up events that were undergone is high. In (1-b) the FA *daily* does not modify an event noun, but a sortal noun *beer*; however, in order to interpret this sentence we still reconstruct some event that ‘beer’ participates in, most likely a drinking event (without any contextual cues), and *daily* specifies that drinking events that involve a beer, distributed one per day, are good for you (see Schäfer 2007; Bücking 2012, for formal accounts of event coercion or interpolation with FAs).

However, there are also cases where an FA combines with a sortal noun that does not get coerced into an event noun but retains its sortal interpretation (2-a) (first discussed in Bolinger 1967, 5), and there are further cases of distribution not in time but in some non-temporal dimension, as in (2-b) (cp. Stump 1981, 227).

- (2) a. The/An occasional sailor strolled by.
 ~ Occasionally, a sailor strolled by.
- b. The/An occasional sailor is six feet tall.

Examples of the latter type, in particular (2-a), have received most attention, since it is not clear how an adjective that is embedded inside a nominal can give rise to a reading in which it apparently scopes over the entire sentence, as suggested by the paraphrasability with a sentence level adverb. This chapter addresses two types of proposals to solve this puzzle.

Under the first kind of approach, taken by authors like Stump (1981), Larson (1998), Zimmermann (2003), and Morzycki (2016), FAs under the reading exemplified

in (2-a) (in particular *occasional*) are not adjectives but rather quantifiers or determiners which can move to a higher position to scope over the entire sentence. This kind of approach, which I label the determiner analysis, explicitly treats FAs like *occasional* in (2-a) as different from other FAs or other uses of FAs, such as those illustrated in (1).

In contrast, authors like Schäfer (2007); Gehrke and McNally (2011, 2015), and Bücking (2012) maintain an adjectival and therefore uniform analysis of all FAs, which I call the adjectival analysis of FAs. Within the adjectival analyses, Gehrke and McNally (2015) make a further division of FAs into temporal and non-temporal ones, depending on the domain over which a given FA can distribute. Temporal FAs, such as *daily*, *frequent*, necessarily involve distribution over the temporal domain and thus are sortally restricted to apply to event nouns or to nominals that can be coerced into events, as in (1-b). Non-temporal FAs, like *rare*, *odd*, on the other hand, are not sortally restricted to events, since they can involve distribution over some other domain, for example space; see (2-b) and (3) (from Gehrke and McNally 2015, 839).

- (3) It's in a room crowded with gauges and microscopes, along with **the odd bicycle and Congo drum**, on a leafy campus surrounded by Washington, D.C.'s Rock Creek Park. (COCA¹)

These authors argue that *occasional* has both temporal and atemporal uses. Since this chapter is primarily concerned with theoretical proposals to capture the adverbial-like reading that non-temporal FAs can bring about, such as those in (2) and (3), temporal FAs will be discussed in detail only at the empirical level.

The chapter is structured as follows. §2 addresses three readings that FAs have been described to have (internal, generic, adverbial), and the restrictions on the nouns and determiners that can be used under these readings. §3 outlines two competing accounts of cases like (2-a), the determiner vs. the adjectival analysis, and ends with some considerations why we might need both types of analysis. Finally, §4 discusses cross-linguistic implications of both types of accounts.

2 Three readings of frequency adjectives

Frequency adjectives have been attributed three readings, internal, generic, and adverbial (see Bolinger 1967; Stump 1981; Zimmermann 2003; Schäfer 2007; Gehrke and McNally 2011, 2015). These readings are commonly diagnosed by paraphrase and they show the following restrictions.

2.1 The internal reading

Under the internal reading (4), the semantic effect of the FA is within the nominal, as the paraphrase suggests.

- (4) Mary is an occasional sailor.
~ Mary is someone who sails occasionally.

¹Corpus of Contemporary American English

The internal reading of FAs arises with participant nouns only (agent nominalisations like *sailor*, but also nominals like *passenger*), which are generally assumed to make available an event variable; adjectives that can apply to events can access this event. It is thus on a par with the much-discussed reading of *Olga is a beautiful dancer* as *Olga dances beautifully* (see Larson 1998), and any account that captured these cases can also be applied to the internal reading of FAs (see, e.g., Winter and Zwarts 2011, for a recent refinement of Larson’s proposal).

Gehrke and McNally (2015, 841) observe that the internal reading arises only with temporal² but not with non-temporal FAs, as the contrast in (5) illustrates.

- (5) a. a daily/weekly Internet user ~ one who uses the Internet daily/weekly
 b. a rare writer ≠ one who writes rarely

There are no determiner restrictions on this reading, as illustrated in (6) (from Gehrke and McNally 2015, 842).

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

In contrast, we find determiner restrictions with the other two readings.

2.2 The generic reading

The generic reading has already been illustrated in (1-b), where the sortal noun *beer* undergoes event coercion into a beer drinking event. Examples that do not involve event coercion are given in (7-a) (for a temporal FA in combination with an event noun) and in (7-b) (for a non-temporal FA in combination with a sortal noun) (from Gehrke and McNally 2015, 842).

- (7) a. A periodic inspection is important.
 ~ An inspection on a periodic basis is important.
 b. The odd glitch is tolerable.
 ~ A glitch on odd occasions is tolerable.

A useful paraphrase for this reading is ‘N on a FA basis’ and similar ones (see Stump 1981; Gehrke and McNally 2015). The generic reading comes about when the FA-modified noun appears with a generic predicate (see Stump 1981; Schäfer 2007), and hence the source of the generic semantics should be sought in the generic context, rather than in the FA itself (see Stump 1981; Schäfer 2007; Gehrke and McNally 2011, 2015; Bücking 2012, for proposals).

Schäfer notes that the generic reading comes with particular determiner restrictions. Gehrke and McNally (2015, 843) make these more precise in showing that with temporal FAs the generic reading requires the indefinite article (7-a) or bare plural (8-a) and is incompatible with the definite article (8-b).

- (8) a. Periodic inspections are important.
 b. ??The periodic inspection is important.

²Including the temporal version of *occasional*, which, recall, is analysed as ambiguous.

Nontemporal FAs, on the other hand, require the definite article (including bleached possessives) for the generic reading (9) (from Gehrke and McNally 2015, 844).

- (9) An odd glitch is/Odd glitches are tolerable.
≠ The occurrence of glitches on odd occasions is tolerable.

We find the same determiner restrictions with the adverbial reading, to which we turn now.

2.3 The adverbial reading

The adverbial reading, already illustrated in (2-a), is the most discussed reading in the literature, since the semantic effect of the FA appears to be outside of the nominal it modifies. In particular, it seems to scope over the entire sentence, as suggested by the adverbial paraphrase in (2-a), something which a DP-internal adjective should not be able to do. Stump (1981), Zimmermann (2003), and Schäfer (2007) observe that this reading is only possible with the (in)definite articles and semantically bleached possessives, as illustrated in (10) (from Gehrke and McNally 2015, 845).

- (10) a. We saw an/the/your occasional car on the road.
 ~ Occasionally, we saw a car on the road.
 b. ??We saw each/every/two/some/many occasional car(s) on the road.

Gehrke and McNally (2015, 846f.) refine this restriction in noting that only *occasional* allows all three determiners; other FAs display the same restrictions as with the generic reading, in the sense that the adverbial reading with temporal FAs requires the indefinite article (11-a) and an event noun (11-b),³ whereas with non-temporal FAs it requires the definite article and is not restricted to event nominals (12).

- (11) a. The storm was punctuated by a/#the sporadic crash of thunder.
 ~ Sporadically, the storm was punctuated by a crash of thunder.
 b. An (in)frequent/sporadic/periodic sailor strolled by.
 ≠ (In)frequently/Sporadically/Periodically, a sailor strolled by.
(12) The/??An odd sailor strolled by.
 ~ On odd occasions, a sailor strolled by.

Stump (1981) notes that FAs on the adverbial reading (henceforth ‘adverbial FAs’) do not behave like regular adjectives. The first “un-adjectival” property he identified is

³ Gehrke and McNally (2014) discuss apparent counterexamples to this generalisation, like those in (i). They observe that these are restricted to certain senses of certain verbs with certain sorts of arguments (contrast (ii)).

- (i) a. She wrote frequent letters. ~ Frequently, she wrote letters.
 b. She baked frequent batches of cookies. ~ Frequently, she baked batches of cookies.
(ii) a. ??She read frequent letters to her mother.
 b. ??She sold frequent batches of cookies.
 c. ??She baked frequent cookies.

See op.cit. for arguments that, despite appearances, the FAs are actually predicated of events in these cases.

that adverbial FAs must appear external to other adjectives. If they appear syntactically closer to the nominal head than other adjectival material, the adverbial reading disappears (13).

- (13) A well-dressed occasional sailor strolled by. (Stump 1981, 248)
≠ An occasional well-dressed sailor strolled by.

Second, adverbial FAs cannot conjoin with other adjectives (14).

- (14) *An occasional and well-dressed sailor strolled by. (Stump 1981, 249)

Third, adverbial FAs cannot appear in the antecedent of a common noun anaphor (15).

- (15) John saw an occasional sailor, and Bill saw one, too. (Stump 1981, 248)
≠ Occasionally John saw a sailor, and occasionally Bill saw one, too.

Morzycki (2016) adds to these data that adverbial FAs also cannot host degree modifiers (16).

- (16) The very occasional sailor strolled by.
≠ Very occasionally, a sailor strolled by.

Thus, the data show that adverbial FAs are different from regular adjectives, and these facts have led to analyses of adverbial FAs not as adjectives but as quantificational determiners; I will sketch one such analysis in §3.1.

On the other hand, Gehrke and McNally (2011) argue that what these data show is not that adverbial FAs are not adjectives per se, rather they are different from adjectives that express simple (first order) properties of individuals (such as physical properties). They can still belong to other classes of adjectives, which also do not display the typical behaviour attributed to adjectives, while still commonly being analysed as adjectives. For example, adjectives like *other* also have to appear external to other adjectival expressions (17-a), and nouns modified by adjectives like *different* can also not serve as antecedent to anaphora (17-b).

- (17) a. *Two well-dressed other sailors strolled by.
b. Mary saw a sailor. John saw a different sailor, and Bill saw one (≠ a different sailor), too.

Gehrke and McNally (2015) furthermore argue that the putative “un-adjectival” behaviour of adverbial FAs is only found with non-temporal FAs, which leads them to posit the analysis of such FAs as predicate modifiers; this account will be sketched in §3.2. For example, it is not possible to add a descriptive adjective to a nominal modified by a nontemporal FA (18-a) (cp. (13)), in contrast to what we find with temporal FAs (18-b) (from Gehrke and McNally 2015, 860), which they analyse as intersective event-modifying adjectives (see op.cit. for the formal details).

- (18) a. ??There was the intelligent occasional/odd/rare preschooler who could do fractions.
b. There was an interesting daily broadcast on TV.

Furthermore, while nontemporal FAs do not coordinate with modifiers that can be given an intersective analysis (19-a) (from Gehrke and McNally 2015, 862) (cp. (14)), for temporal FAs in combination with event nouns, such coordinations are attested (19-b) (from Gehrke and McNally 2011).

- (19) a. ??The museum had the odd/rare and brief visit from school groups.
 b. There are occasions when, because of outside atmospheric conditions, an occasional and brief down draft will occur within the chimney and fire box... (<http://www.patentstorm.us/patents/6298844/description.html>)

Thus, the data show that non-temporal adverbial FAs are different from intersective adjectives that express first order properties of individuals. However, they are also different from temporal FAs in this respect.

Additional evidence for the division of FAs into these two classes, independently of whether or not we are dealing with the adverbial reading, comes from the observation in Gehrke and McNally (2015) that only temporal FAs can be used predicatively (20-a), whereas non-temporal FAs cannot (20-b) (on the relevant reading) (from Gehrke and McNally 2015, 849).

- (20) a. The check-up was weekly/infrequent/frequent/periodic/sporadic.
 b. ??The mosquito was occasional/odd.

They argue that these facts suggest a property-type analysis of temporal FAs, which is typical for intersective adjectives, but a predicate modifier (albeit adjectival) analysis of non-temporal FAs.

2.4 Summary and implications

The following table (from Gehrke and McNally 2015, 847) summarises the empirical generalisations reached in this section.

Type of FA	Temporal	Nontemporal	Both
	<i>(in)frequent, periodic, sporadic daily, etc.</i>	<i>odd, rare</i>	<i>occasional</i>
Examples			
Nontemporal distribution	*	✓	✓
Adverbial reading with non-event nouns	*	✓	✓
Internal reading	✓	*	✓
Predicative use on relevant reading	✓	*	✓
Determiner used with the generic and/or adverbial reading	✓ <i>a</i> ?? <i>the</i>	?? <i>a</i> ✓ <i>the</i>	✓ <i>a</i> ✓ <i>the</i>

Table 1: Empirical generalisations

Different analyses have been proposed to account for the semantics of FAs. On the one hand, there are unified analyses of FAs as adjectives (Schäfer 2007; Gehrke and McNally 2011; Bücking 2012), which capture different readings by taking into account the context in which the FA appears. On the other hand, there are accounts of only the adverbial reading (Stump 1981; Larson 1998; Zimmermann 2003; Morzycki 2016), Zimmermann’s ‘*occasional-construction*’, according to which especially *occasional* is not really an adjective but a quantificational determiner. None of these analyses capture the whole set of data, for which Gehrke and McNally (2015) argue it is important to take into account the division between temporal and non-temporal FAs.

Given that there is (at least implicit) consensus that FAs can also function as ‘regular’ adjectives with their semantic effect within the nominal they modify, in particular when they combine with participant nouns on the internal reading and with event nouns on the other readings, and given that such an analysis is more straightforward, I will not discuss it here. For a formal semantic approach to temporal FAs, see Gehrke and McNally (2015), who analyse them as intersective adjectival modifiers that are sortally restricted to apply to (kinds or pluralities of) events and put conditions on the distribution of such events. For other accounts of the internal and generic reading, see Schäfer (2007) and Bücking (2012). In the remainder of this chapter, I focus on the issues raised by adverbial FAs in combination with non-event nouns, and the two types of accounts proposed to solve these issues.

3 The *occasional-* construction vs. non-temporal FAs

In this section, I address two types of accounts of the adverbial reading of FAs. The first type (Stump 1981; Larson 1998; Zimmermann 2003; Morzycki 2016) analyses such FAs as quantifiers or determiners, hence the label ‘determiner analysis’. This type of account does not (nor is it intended to) extend to the other two readings, and I will illustrate it with Zimmermann’s proposal. The second type of account provides a unified analysis of FAs under all readings as adjectives (Schäfer 2007; Gehrke and McNally 2011, 2015; Bücking 2012), hence the label ‘adjectival analysis’. I will illustrate this type of account by spelling out Gehrke and McNally’s (2015) account of adverbial non-temporal FAs. I will end this section by a brief discussion of arguments presented by Sæbø (2016) that we might need both types of analyses.

3.1 Zimmermann (2003): ‘the *occasional-construction*’

Zimmermann (2003) argues that FAs under the adverbial reading, as in our classical example (2-a), repeated in (21), are not adjectival modifiers but quantifiers.

(21) The/An occasional sailor strolled by.

To capture their quantificational nature he proposes the syntax in (22) (from Zimmermann 2003, 271).

(22) [IP[QP[Q the/an+occasional₁][NP t₁ sailor]]₂[VP t₂ strolled by]]

The quantificational FA is argued to syntactically incorporate into the determiner to form with it a complex determiner; this quantificational noun phrase (QP) then raises (by quantifier raising, QR) from its VP-internal subject position to the IP domain, where its quantificational force scopes over the rest of the sentence.

The result of incorporation is interpreted as a complex pluractional quantifier INFREQ over event-individual pairs that are found within a larger, contextually identified event, building on Lasersohn’s (1995) account of pluractionality (see also Beck, this volume, on further discussion of pluractional operators). Simplifying his formal account somewhat, we arrive at the less formal semantics in (23-a) and the paraphrase in (23-b) (adapted from Zimmermann 2003, 272).

- (23) a. $\llbracket \text{an/the occasional N VP} \rrbracket$:
 $(\text{INFREQ}(e, x) : \text{part-of}(e, e^*) \wedge \text{N}(x))[\text{VP}(e, x)]$
 b. There are some pairs $\langle e, x \rangle$, with e part of a contextually given event e^* , and x having property **N**, such that e is an event of x **VP**-ing, and any two events of x **VP**-ing occur at separate points in time.

Given this semantics, (21) can be paraphrased as follows: There are some pairs $\langle e, x \rangle$, where e is a part of a contextually given event e^* , and x a sailor, such that e is a strolling-by of x , and any two strolling-by events of a sailor occur at separate points in time.

3.1.1 How the determiner account captures the empirical facts

Treating adverbial FAs as part of a complex quantificational determiner that QRs and gets scope over the entire sentence, directly captures the fact that they can be paraphrased as sentential adverbs. Second, the determiner restrictions with adverbial FAs to *a*, *the*, and bleached possessives are explained as follows. Zimmermann treats these determiners as lacking semantic content and argues that complex quantifier formation is only possible if the determiner lacks such content.⁴ Finally, treating adverbial FAs not as adjectives accounts for their “un-adjectival” behaviour, outlined in §2.3, which were identified in Stump (1981) and which played a role in motivating his version of the determiner analysis, which is similar in spirit to this one.

Finally, treating adverbial FAs as quantificational determiners also captures the fact that they cannot be used predicatively, even if this has not been observed in this literature. Zimmermann provides further arguments from German and Finnish to support his proposal that adverbial FAs are determiners that undergo QR to derive sentence-level scope. I will come back to these data in §4.

3.1.2 Problems for the determiner analysis

The determiner analysis also faces some problems (as discussed in Gehrke and McNally 2015, 865ff.). For example, it predicts that adverbial FAs should give rise to sentence-level scope readings in all environments in which other quantifiers can have

⁴Though, as mentioned in §2, the picture gets more complex if we take into account other FAs; since Zimmermann is mainly concerned with *occasional*, though, the determiner restrictions are such.

sentence-level scope. This prediction is not borne out. For example, the FA in (24) can be paraphrased adverbially but does not have sentence-level scope.

- (24) Idling beside the propped-open kitchen window he registers the occasional car swishing past, three stories below. (COCA)

In contrast, when we substitute the determiner *many* for *the occasional*, the sentence can be paraphrased as in either (25-a) or (25-b).

- (25) Idling beside the propped-open kitchen window he registers many cars swishing past, three stories below.
a. There are many cars swishing past that he registers.
b. There are many cars such that he registers them swishing past.

The determiner analysis incorrectly predicts that (24) should give rise to two analogous paraphrases, contra the facts.

Another problem is that treating the acceptable determiners with adverbial FAs as semantically empty and having the quantificational force provided solely by the FA leaves unexplained why the FA must be accompanied by an overt article in the first place, that is, why (26) is unacceptable.

- (26) *Occasional sailor strolled by.

One way out could be to say that there is some independently motivated syntactic requirement in English for FA-N combinations to combine with a D, even if the FA itself is a quantifier, rather than an adjective. However, when we add the temporal/non-temporal division, i.e. the fact that temporal adverbial FAs are restricted to the indefinite and non-temporal ones to the definite article, Zimmermann's account of the determiner restriction is even further weakened. Moreover, since the determiner analysis does not relate the generic and adverbial paraphrases, it has nothing to say about why any given FA shows a similar pattern of determiner restrictions on both readings.

3.1.3 Morzycki (2016) on determiner restrictions with adverbial adjectives

Morzycki (2016) argues that what he calls non-local readings of adjectives (i.e. the paraphrasability as sentence level adverbs) is not as exotic as one might think, and he discusses a number of different such classes, one of which comprises *occasional*. According to him adjectives with non-local readings have in common that they allow an adverbial paraphrase, come with particular determiner restrictions, and display the "un-adjectival" behaviour discussed in §2.3. Furthermore, he divides such adjectives into two subgroups, those that only allow (in)definite articles and bleached possessives, such as *occasional* and also *average* (27-a) (see Kennedy and Stanley 2009), and those that additionally allow weak determiners, such as *whole* (27-b) (on which see Moltmann 1997), among others.

- (27) a. The average American has 2.3 children.
b. A whole ship was submerged. ~ A ship was wholly submerged.

He then sketches an analysis for the first class (*occasional, average*) which, like Zimmermann’s (2003), treats such adjectives as quantificational (i.e. of type $\langle et, \langle et, t \rangle \rangle$), but which, unlike it, does not rely on incorporation and does not treat the possible determiners as semantically empty. In particular, he assumes that the trace of the moved adjective is shifted (by the BE type shift in Partee 1987) to *et*, the type that then combines with the determiner; the semantic import of the definite and indefinite determiners remains untouched, very much like under the adjectival analysis I will outline in the following section (see op.cit. for details). Strong determiners, then, are argued not to be able to combine with this trace because they presuppose that their domain has more than one member, but the trace denotes a singleton set. Weak determiners, on the other hand, are not acceptable because the trace is treated as a kind (following Gehrke and McNally 2011), and kinds do not have cardinalities.

3.2 The adjectival analysis: Non-temporal FAs

Gehrke and McNally (2015) (G&McN) propose that non-temporal FAs are exclusively modifiers of predicates of kinds (which can be event or individual kinds), indicated by the subscript k in (28) (from G&McN, 860).

$$(28) \quad \llbracket \mathbf{FA}_{nontemp} \rrbracket: \lambda P \lambda x_k [(\mathbf{FA}(P))(x_k)]$$

In addition, they posit the satisfaction conditions for non-temporal FAs in (29) (from G&McN, 860), which state that in order for a kind to exist at some index i , at least one realisation of the kind should exist at i (\mathbf{R} is the realisation relation, building on Carlson 1977).

$$(29) \quad \forall P, x_k, i [(\mathbf{FA}_{nontemp}(P))(x_k) \text{ at } i \leftrightarrow [P(x_k) \wedge \mathbf{distribution}(\{y : \mathbf{R}(y, x_k) \text{ at } i\}) = \mathit{dist}]]$$

Building on Schäfer (2007), **distribution** is a function that yields the distribution *dist* of a set of entities at i , with values like *high, low*, etc., depending on the FA in question (with the three non-temporal FAs, *occasional, rare, odd*, it is low or very low). G&McN furthermore propose that if a kind is realised by a set of tokens in a particular distribution, each element of the set that realises the participant should participate in a token event of the relevant event kind. The exclusive function of non-temporal FAs, then, is to provide information about the distribution of the realisations of the kind they modify.

The representation for a DP containing a nontemporal FA appears in (30) (from G&McN, 862), where the denotation of the definite article, the only available determiner, is represented with the iota operator.

$$(30) \quad \llbracket \text{the odd car} \rrbracket: \iota x_k [(\mathbf{odd}(\mathbf{car}))(x_k)]$$

G&McN assume the same semantics for both generically and adverbially used non-temporal FAs, since the generic force of the sentence is attributed to the generic predicate rather than the FA (see op. cit. for further details). Here, I will only focus on adverbial non-temporal FAs, for example (31).

- (31) a. The odd car swished past.
 b. $\exists e_k[\text{swished_past}(e_k, \iota x_k[(\text{odd}(\text{car}))(x_k)])]$

In prose, there is an event kind of swishing past that involves the unique car subkind whose realisations (in such event realisations, given the satisfaction conditions above) have a very low distribution (see op.cit. for the formal details).

3.2.1 How the adjectival analysis captures the empirical facts

Treating non-temporal FAs as predicate modifiers directly accounts for the fact that they lack a predicative use. Second, it follows directly from this semantics that we will not get the internal reading with nontemporal FAs, which arises when the FA intersectively modifies an internal event argument within the representation of a nominal; predicate modifiers cannot do this (see op.cit. for further discussion). Third, the analysis of adverbial FAs as modifiers of kind predicates also captures their putative “un-adjectival” behaviour. For example, non-temporal FAs cannot coordinate with intersective adjectives that express first order properties of individuals, because they are not of the same semantic type. The fact that they have to appear closest to the noun is shared with other adjectives that are restricted to the kind level, for instance relational adjectives (see McNally and Boleda 2004; Arsenijević et al. 2014).

Finally, G&McN argue that only those determiners are possible with non-temporal FAs that entail uniqueness, hence the restrictions of (both adverbial and generic) non-temporal FAs to definites and bleached possessives. While other kind-level modifiers can restrict set-denoting kind descriptions (e.g. *car*) to sets of subkinds (e.g. *2-door car*, *sports car*, etc.), they argue that with kinds modified by non-temporal FAs, when these are realised by a set of tokens distributed in the way specified by the FA, these tokens necessarily realise the maximally general and therefore unique kind described by the nominal. In particular, a nontemporal FA takes a kind description and imposes conditions on the realisations of the corresponding kind. In order for those conditions to be met, the identity of the kind that will participate in the realisation relation must be established, so that it is expected to be the unique, most general kind described by the nominal that the FA combines with. As a result, when the FA combines with a kind description, it returns the description of the unique kind upon whose realisations distributional conditions are being imposed.⁵

3.2.2 Problems for the adjectival analysis of adverbial *occasional*

While the adjectival analysis of non-temporal FAs proposed by G&McN can account for the adverbial paraphrase of such FAs not by actually giving them wide scope but by treating the apparent wide scope as a kind of illusion that arises due to the particular semantics proposed and the contexts in which they appear, it also has some shortcomings. For example, under this account *occasional* is ambiguous between a temporal

⁵The restriction of temporal FAs to indefinites, under both generic and adverbial reading, has to receive a different explanation. G&McN propose that in the former case, the indefinite is non-quantificational, just like in other generic sentences with indefinite singulars (see, e.g., Farkas and Sugioka 1983; Cohen 2001; Greenberg 2002; Krifka 2013). They treat adverbial temporal FAs as instances of indefinite kind nominals (see, e.g., Dayal 2004; Mueller-Reichau 2011).

and a non-temporal FA, and it is not clear why that would be. Thus, with respect to this particular FA the proposal does not fare much better than the determiner account, which also has to assume two lexical entries (one as an ordinary adjective and one as a determiner). In this context, a more crucial problem is that the adverbial reading of *occasional* in combination with a sortal noun is equally possible with the indefinite article (32).

(32) An occasional sailor strolled by.

G&McN predict that the adverbial reading with a sortal noun is only possible with non-temporal FAs (including the non-temporal version of *occasional*) but these explicitly require the definite article.

Finally, DeVries (2010) points out (as discussed in Sæbø 2016) that the uniform account of FAs as adjectives provided by Gehrke and McNally (2011) merely derives that, e.g. in our original example, sailors are occasionally realised, but not that they are occasionally realised in passing-by events (the same problem arises for G&McN). Thus, in principle, they could be occasionally realised in all kinds of events (e.g. sitting on the sidewalk, drinking a beer at a bar, etc.), but this is not actually a possible scenario for our sentence. This kind of criticism has led Sæbø (2016) to investigate such sentences further, ultimately concluding that we might actually need both types of analysis.

3.3 We might need both types of analysis

Sæbø (2016) observes that Zimmermann's (2003) proposal predicts adverbial FAs to always have wide scope. He shows that for (33) this prediction is borne out, since the distribution specified by the FA is only for the kinds of events specified by the VP, but not other events, where there are many windows but only a few in which there was light.

(33) Most of the houses were still dark, though a light shone in the occasional window.

However, Sæbø argues that Zimmermann makes the wrong predictions for (34), which involves a narrow scope construal only.

(34) From the occasional window you have a magnificent view towards the coast.

Gehrke and McNally (2015), on the other hand, capture the narrow scope interpretation of the adverbial FA in (34) but does not directly account for (33), given DeVries's (2010) objection to the adjectival analysis outlined in the previous section.

Sæbø then discusses the Norwegian complex determiner *ei(-) og anna(-)* '(lit.) one and other', illustrated in (35), which, he argues, corresponds to English *occasional* (under the adverbial reading). He shows that it only allows wide scope readings, along the lines of (33), lending cross-linguistic support to the determiner analysis of *occasional* (under this reading).

(35) a. En og annen abbor belt på.
one and other perch bit on

- b. Ei of anna stjerne lyste enno.
one and other star shone yet
- c. Mange overbefolkede vann inneholder en og annen storfisk.
many overpopulated lakes contain one and other bigfish

However, he also notes that Zimmermann’s account, which always predicts distribution to be temporal, cannot account for examples like (35-b,c), which involve distribution in 2- and 3-dimensional space (something which is also addressed by Gehrke and McNally 2015, recall (2-b)). His proposal, then, generalises the notion of distribution to cases like these (along the lines of Gawron 2006, and his notion of a generalised path).

While most of the literature on FAs deals with English, the Norwegian data in (35) open up comparison to other languages. In the final section of this chapter, I add further preliminary data observations from German, Spanish, and Irish, though at this point I can only scratch the surface, since more in-depth research needs to be done.

4 Cross-linguistic implications

Let us take a closer look at German, for which we have a bit more data already discussed in the literature, even if only in passing (Zimmermann 2003; Schäfer 2007; Bücking 2012; Gehrke and McNally 2015). Both Schäfer and G&McN conclude that German lack adverbial readings of FAs with non-event nouns (for G&McN: it lacks non-temporal FAs), whereas Zimmermann and Bücking assume adverbial FAs to exist in German, even if more restricted. Zimmermann, who does not control for the nominals that adverbial FAs appear in, argues that restrictions on the availability of this reading in German follow from independently motivated restrictions on QR. Bücking, on the other hand, cannot explain why this reading is more restricted in German (see his footnote 7), but he argues that FAs in both languages always apply to events (following Gehrke and McNally 2011) and that *occasional* with sortal nouns leads to the interpolation of a mediating eventive type, within Asher’s (2011) logic for type composition. In the following, I compare Zimmermann’s and G&McN’s observations.

Instead of the German counterpart of the classical example in (2-a), Zimmermann (2003, 260) uses (36-a) to exemplify the adverbial reading in German. He furthermore claims that, unlike English, German allows adverbial FAs only in subject position, as illustrated by the contrast between (36-a) and (36-b-d) (from Zimmermann 2003, 261).

- (36) 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

Zimmermann attributes this observation to the independently known fact that in Ger-

man non-subject quantified phrases cannot take inverse scope at LF and takes this to support an analysis on which the FA has the semantics of a quantificational determiner. In further support for this claim, he notes that preposed topicalised objects, like the one in (37) (from Zimmermann 2003, 263; also his non-literal translation), are fine on the adverbial reading.

- (37) Ein gelegentliches Bierchen haben wir auch getrunken.
 an-occasional-beer.ACC have we also drunk
 ‘Of course, we have occasionally drunk a beer, too.’

Thus, these data, if they turn out to be correct, provide further independent support for the determiner analysis of such occurrences of FAs, which derives a wide scope reading of the FA by QR. Zimmermann furthermore notes that Finnish behaves on a par with German in this respect (see there for relevant examples).

Gehrke and McNally (2015) argue that there are reasons to doubt Zimmermann’s empirical generalisations. In particular, they confronted eleven German native speakers with Zimmermann’s data in (36). These speakers unanimously rejected examples like (36-b)-(36-d), as predicted by Zimmermann. However, four speakers also rejected (36-a), and only one of the seven who accepted it, clearly allowed for the adverbial reading. The other six allowed this sentence under the internal reading only, as supported by spontaneous responses like ‘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’. Consistent with this judgment, these speakers all accepted the discourse in (38) (from G&McN, 851), which would be impossible under the adverbial reading, while the speaker who got the adverbial reading for (36-a) did not.

- (38) 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.’

G&McN conclude, contra Zimmermann, that the adverbial reading is not reliably available for (36-a) either.⁶

In addition, and this was not discussed in G&McN, when the same eleven speakers were presented with Zimmermann’s (37), eight agreed that this example is, in fact, acceptable. However, nine equally liked or even preferred (39) (on the relevant reading), where the DP containing the FA remains in object position, out of which QR is supposed to be impossible.

- (39) Wir tranken ein gelegentliches Bier.
 we drank an-occasional-beer.ACC
 ‘We drank an occasional beer.’ (~ ‘Occasionally, we drank a beer.’)

Hence, overall these facts cannot be considered independent support for a determiner

⁶However, given that one of the eleven consultants seemed to accept the adverbial reading, there might be some speaker variation (incidentally, this was the only Austrian German speaker, the others were Federal German ones), or this speaker might have been influenced by English (at the time living in the Netherlands and working in an English-speaking environment).

analysis of *gelegentlich*. At most, they could point towards the absence of complex determiners in German.

G&McN conclude that German simply lacks nontemporal FAs, also evident by the ungrammaticality of the German translation of the original example or of cases involving non-temporal distribution (40) (from G&McN, 850), and by the fact that all instances of acceptable adverbial readings of FAs in German involve event nominals, as in (41) (from G&McN, 851), or sortal nouns coerced into event readings, which is arguably the case in (39).

- (40) *{Ein gelegentlicher / der gelegentliche} Matrose {schlenderte vorbei / ist 2
 an occasional the occasional sailor strolled by is 2
 Meter groß}.
 meters tall
- (41) 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.’

Under their account, the adverbial paraphrase in this case is the result of a distinct compositional process, due to the fact that the adjective modifies an event nominal.

More generally, then, we are faced with the cross-linguistic situation that adverbial readings of FAs like *occasional* in combination with non-event nouns are possible in English but not in German. G&McN argue that the two types of FAs having different distributions in different languages is not a surprise under their account, given that non-temporal FAs have a slightly different semantics, and in particular a different semantic type, from temporal ones. They furthermore note in passing that Spanish also seems to lack non-temporal FAs, see (42) (from G&McN, 861).

- (42) ??Pasaba el { ocasional coche / coche ocasional }.
 passed the occasional car car occasional
 Intended: ‘The occasional car passed by.’

In the context of G&McN’s comparison of German and English, James McCloskey (p.c.) pointed out that Irish appears to be the mirror image of German, in the sense that it lacks temporal FAs (for meanings like *frequent*, *occasional* etc.) but has one adjective that could count as a nontemporal FA, namely *corr* (see footnote 22 in G&McN). As McCloskey reports, this adjective has the meaning ‘peculiar, unusual’ in postnominal position (43).

- (43) fear corr
 man peculiar
 ‘a strange/weird man’

He furthermore observes that in prenominal position it is interpreted like a nontemporal FA, and he provides the (naturally occurring) examples (and translations) in (44).

- (44) a. Tá corr-chorrán fós féin sa gceantar seo
 is odd-sickle still even in-the area this
 ‘There’s still the odd sickle in this area.’

- b. Ní bhíodh idir í agus uncail a hathar ach an
 NEG used-to-be between her and uncle her father.GEN but the
 corr-fhocal.
 odd-word
 ‘There was only the odd word (exchanged) between herself and her fa-
 ther’s uncle.’

Given that in Irish, pronominal adjectives form compounds with the nouns they modify, a complex determiner analysis involving the incorporation of the adjective into the determiner in this case is out of the question though. On the other hand, unlike English nontemporal FAs, Irish *corr* does not require the definite article (44-a), though it is compatible with it (44-b). According to McCloskey, the presence or absence of the definite article does not have a semantic consequence. Thus, even though Zimmermann’s (2003) version of the determiner analysis will not work for these cases, Sæbø’s (2016) or Morzycki’s (2016) might, once they are fully worked out. But these are tasks for future research.

In sum, this preliminary cross-linguistic situation can be explained in two different ways. Within the adjectival analysis, languages like German and Spanish lack nontemporal FAs, Irish lacks temporal FAs, and languages like English and Norwegian have both. Alternatively, if indeed both accounts are needed, as argued by Sæbø, some languages turn out to have determiner-like adjectives, e.g. *occasional*, *average* in English or *ei(-) og anna(-)* in Norwegian. In contrast, languages like German and Spanish lack such adjectives, at least in the domain of FAs, so that FAs in these languages behave like all other FAs, possibly also in English and Norwegian: as adjectives that necessarily modify (or predicate over) events and thus express temporal distribution locally (within the NP). We might then arrive at a determiner analysis for the former but at an adjectival analysis for the latter, and the variation itself would be confined to the lexicon. Further research has to show how other languages fit into this picture.

References

- Arsenijević, Boban, Gemma Boleda, Berit Gehrke, and Louise McNally. 2014. Ethnic adjectives are proper adjectives. In *CLS 46-1 The Main Session: Proceedings of the 46th Annual Meeting of the Chicago Linguistic Society*, ed. Rebekah Baglini, Timothy Grinsell, Jonathan Keane, Adam Roth Singerman, and Julia Thomas, 17–30. Chicago: Chicago Linguistic Society.
- Asher, Nicholas. 2011. *Lexical Meaning in Context*. Cambridge: Cambridge University Press.
- Bolinger, Dwight. 1967. Adjectives in English: Attribution and predication. *Lingua* 18:1–34.
- Bücking, Sebastian. 2012. The semantics of frequency adjectives. In *Proceedings from the Annual Meeting of the Chicago Linguistic Society* 48, 93–107.

- Carlson, Gregory N. 1977. Reference to Kinds in English. Doctoral Dissertation, University of Massachusetts at Amherst. Published in 1980 by Garland Press, New York.
- Cohen, Ariel. 2001. On the generic use of indefinite singulars. *Journal of Semantics* 18.3:183–209.
- Dayal, Veneeta. 2004. Number marking and (in)definiteness in kind terms. *Linguistics and Philosophy* 27:393–450.
- DeVries, Karl. 2010. Frequency adjectives. BA thesis, Michigan University.
- Farkas, Donka F., and Yoko Sugioka. 1983. Restrictive if/when clauses. *Linguistics and Philosophy* 6:225–258.
- Gawron, Jean Mark. 2006. Generalized paths. In *Proceedings of SALT 15*, ed. Effi Georgala and Jonathan Howell. Ithaca: Cornell University.
- Gehrke, Berit, and Louise McNally. 2011. Frequency adjectives and assertions about event types. In *Proceedings of SALT 19*, ed. Ed Cormany, Satoshi Ito, and David Lutz, 180–197. Ithaca: CLC Publications.
- Gehrke, Berit, and Louise McNally. 2014. Event individuation by objects: Evidence from frequency adjectives. In *Proceedings of Sinn und Bedeutung 18*, ed. Urtzi Etxeberria, Anamaria Falaus, Aritz Irurtzun, and Bryan Leferman, 146–163. semanticsarchive.
- Gehrke, Berit, and Louise McNally. 2015. Distributional modification: The case of frequency adjectives. *Language* 91.4:837–870.
- Greenberg, Yael. 2002. Two types of quantificational modalized genericity and the interpretation of bare plurals and indefinite singular NPs. In *Proceedings of SALT 12*, ed. Brendan Jackson, 104–123. Ithaca, NY: CLC Publications.
- Kennedy, Christopher, and Jason Stanley. 2009. On *average*. *Mind* 118(471):583–646.
- Krifka, Manfred. 2013. Definitional generics. In *Genericity*, ed. Alda Mari, Claire Beyssade, and Fabio Del Prete, 372–389. Oxford University Press.
- Larson, Richard. 1998. Events and modification in nominals. In *Proceedings of SALT 8*, ed. Devon Strolovitch and Aaron Lawson, 145–168. Ithaca, NY: CLC Publications.
- Laserson, Peter. 1995. *Plurality, Conjunction and Events*, volume 55 of *Studies in Linguistics and Philosophy*. Dordrecht: Kluwer.
- McNally, Louise, and Gemma Boleda. 2004. Relational adjectives as properties of kinds. In *Empirical Issues in Formal Syntax and Semantics 5*, ed. Olivier Bonami and Patricia Cabredo Hofherr, 179–196. <http://www.cssp.cnrs.fr/eiss5>.

- Moltmann, Friederike. 1997. *Parts and Wholes in Semantics*. Oxford: Oxford University Press.
- Morzycki, Marcin. 2016. Toward a general theory of nonlocal readings of adjectives. In *Proceedings of Sinn und Bedeutung 20*, ed. Nadine Bade, Polina Berezovskaya, and Anthea Schöller, 515–532. semanticsarchive.
- Mueller-Reichau, Olav. 2011. *Sorting the World: On the Relevance of the Kind-Level/Object-Level Distinction to Referential Semantics*. Frankfurt/M.: Ontos Verlag.
- Partee, Barbara. 1987. Noun phrase interpretation and type-shifting principles. In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, ed. Jeroen Groenendijk, Dick de Jongh, and Martin Stokhof, 115–143. Dordrecht: Foris.
- Sæbø, Kjell Johan. 2016. Adjectives and determiners of distribution. Ms. Oslo University.
- Schäfer, Roland. 2007. On frequency adjectives. In *Proceedings of Sinn und Bedeutung 11*, ed. Estela Puig Waldmüller, 555–567. Barcelona: Universitat Pompeu Fabra.
- Stump, Gregory T. 1981. The interpretation of frequency adjectives. *Linguistics and Philosophy* 5:221–256.
- Winter, Yoad, and Joost Zwarts. 2011. On the event semantics of nominals - the one-argument hypothesis. Paper presented at the 16th Sinn und Bedeutung, Utrecht University, September 2011.
- Zimmermann, Malte. 2003. Pluractionality and complex quantifier formation. *Natural Language Semantics* 11:249–287.