Dispositional causal relations: a case study on Emission Verbs in German

Abstract This paper argues that when thematic roles are restricted to judgements about causal properties of events, this falls short of accounting for cases where thematic roles reflect judgements about dispositional properties of objects. I develop my argument with a case study on a class of intransitive verbs that have been called Emission Verbs and which are difficult to bring in line with the unaccusativity hypothesis put forward in Perlmutter (1978). Reviewing two diametrically opposed accounts of Emission Verbs in the literature (Levin and Rappaport Hovav (1995) vs. Reinhart (2002)), I show that the thematic-semantic relation between the events described by Emission Verbs and their single arguments cannot be characterized unambiguously in terms of causal properties of events but pertains to dispositional properties of the emitter argument. I follow Zaenen (1988) in arguing that Emission Verbs semantically constitute a third distinct class of intransitives but extend what sets Emission Verbs semantically apart from unergatives and unaccusatives to the syntax, by proposing a syntactic structure of Emission Verbs that differs from those for the other two intransitive verb classes of unergatives and unaccusatives.

Keywords Emission Verbs · Lexical Semantics · Syntax-Semantics Interface · Event Semantics · Unaccusativity Hypothesis · Disposition · Causation · Argument Structure · Thematic Roles · German

1 Introduction

A fundamental challenge for the elaboration of the relation between syntax and semantics is that “the ‘natural’ grammatical relations such as subject or object do not correspond in any simple fashion to the understood semantic relations” (Jackendoff, 1972, p. 25), consider (1).

(1) a. John broke the window.  
   b. The window broke.
Intuitively, *the window* in (1-a) and (1-b) is understood to stand in the same semantic relation to the verb *to break* although it stands in the grammatical object relation to the verb in (1-a) but in the grammatical subject relation to the verb in (1-b). The falling apart of grammatical and semantic relations in examples such as (1) is standardly explained with the assumption that verbs do not only encode explicit grammatical relations such as subject and object but also covertly encode a ‘deep’ structure of semantic relations. In the pioneering work of Fillmore (1968), these covert semantic relations are characterized as “a set of universal, presumably innate, concepts which identify certain types of judgements human beings are capable of making about the events that are going about around them, judgements about such matters as who did it, who it happened to, and what got changed.” (Fillmore, 1968, p. 45f.). Following Jackendoff (1972), covert semantic relations are nowadays standardly called ‘thematic roles’\(^1\). The thematic role of an Agent “attributes to the NP will or volition toward the action expressed by the sentence” (Jackendoff, 1972, p. 32) and thus the Agent causes the event described by the verb. In contrast, the Patient relation is assigned to that noun phrase which undergoes a change of state in the absence of will or volition. Accordingly, in (1-a) the grammatical subject *John* bears the thematic role of an Agent because will or volition towards causing the event described is attributed to *John* with (1-a) and the grammatical object *the window* bears the Patient role because it undergoes a change of state (from intact to broken) that is caused by John’s action. In (1-b), although *the window* stands in the grammatical subject relation to the verb, it cannot bear the Agent role because *the window* is not attributed will or volition towards the event described. Instead, *the window* is attributed the thematic role of a Patient.

While the conceptual groundwork of Fillmore and Jackendoff on the semantic relation between a verb and its arguments has become a primary ingredient of linguistic theorizing, there is disagreement about virtually every aspect of the codification of a comprehensive theory of thematic roles, e.g. with respect to the hierarchy and number of thematic roles (e.g. Croft (1998))\(^2\), whether thematic roles are determined in the lexicon or the syntax (e.g. Hale and Keyser (1993)) and, above all, what the defining properties of thematic roles like Agent or Patient are (e.g. Dowty (1991)) such that in sum it appears that “[t]here is perhaps no concept in modern syntactic and semantic theory which is so often involved in so wide a range of contexts, but on which there is so little agreement as to its nature and definition, as THEMATIC ROLE” (Dowty, 1991, p. 547). The aim of this paper is to put yet a further issue about thematic roles on the research agenda.

This paper argues that when thematic roles are restricted to human judgements about causal properties of *events*, this falls short of accounting for cases where thematic roles reflect human judgements about causal properties of *objects*. I develop

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\(^1\) Jackendoff (1972) shares with Fillmore (1968) the assumption that there is a restricted inventory of covert universal semantic relations but among others differs in allowing noun phrases to be attributed more than one semantic relation within the same sentence.

\(^2\) A telling example of disagreement is the question for whether the thematic role of a Patient should or can be distinguished from that of a Theme. While Jackendoff (1972) distinguishes Patients which undergo a change of state from Themes which are moving entities, Grimshaw (1990) conflates both roles. To simplify the matter, in this paper I follow Dowty (1991) and assume that there are just two relevant clusters of thematic properties and refer to them as Agent and Patient.
my argument with an in-depth study of a class of intransitive verbs that have been called ‘Emission Verbs’ and which comprises e.g. the verb to glow. I argue that the thematic relation between the events described by Emission Verbs and their single arguments cannot be characterized unambiguously in terms of causal properties of events but pertains to causal properties of the single argument of the Emission Verb. My argument is structured as follows. The next section 2 introduces the characteristic features of the class of Emission Verbs against the background of the unaccusativity hypothesis put forward in Perlmutter (1978). Section 3 reviews two diametrically opposed proposals for the thematic analysis of the single argument of Emission Verbs and argues to resolve the conflict by analyzing the events described by Emission Verbs as the manifestation of a dispositional property residing in the single argument of the verb, such as the disposition of a diamond to glow when light falls on it. The semantic characterization of the relation between verbs like to glow and their single arguments in terms of dispositional properties semantically sets apart verbs like to glow from intransitive verbs in which the thematic relation between the verb and the single argument is determined by causal properties of events. I conclude that Emission Verbs constitute a distinct semantic class of intransitives and corroborate the distinct semantic status of Emission Verbs by showing in section 4 that they are also syntactically distinct from the other two classes of intransitives determined by Perlmutter’s hypothesis. In section 5 I provide a detailed reconstruction of the syntax and semantics of Emission Verbs and extend the prevalent inventory of thematic roles with the thematic role of a Medium in which a disposition resides and manifests itself when appropriate external circumstances obtain. Section 6 concludes.

2 An unaccusativity mismatch: Emission Verbs

According to the so-called unaccusative hypothesis put forward in Perlmutter (1978) there are two types of intransitive verbs. If the grammatical structure of a transitive verb relates a grammatical subject to a grammatical object, then the grammatical structure of unergative verbs like to laugh has a grammatical subject but no grammatical object and the grammatical structure of unaccusative verbs like to stumble has a grammatical object but no grammatical subject. Grewendorf (1989) argued that in German – the language from which I take my examples in the following – the distinction between unergative and unaccusative verbs is syntactically represented. First – as Perlmutter argued it to be the case for Dutch – German unergative verbs like lachen (‘to laugh’) appear in impersonal passives (2-a) while unaccusative verbs like ankommen (‘to arrive’) do not (2-b).

(2) a. Es wurde gelacht. it be.AUX.PASS laugh ‘It was laughed.’

In this paper, I restrict attention to the diagnosis of unaccusativity with impersonal passives and auxiliary selection. First, these two tests are relatively reliable syntactic indicators of unaccusativity in German. Second, other tests like the licensing of prenominal participles provide only a negative characterization of Emission Verbs.
Second, unergative verbs like *lachen* select the perfect auxiliary *haben* (‘have’) (3-a) while unaccusative verbs like *ankommen* select *sein* (‘be’) (3-b).

(3) a. Sie hat gelacht.
    she have.AUX laugh
    ‘She has laughed.’

b. Sie ist angekommen.
    she be.AUX arrive.PRS.PRF
    ‘She is arrived.’

The grammatical distinction between unergative and unaccusative verbs correlates with a distinction in the understood semantic relations: “intransitive predicates argued to be unaccusative on syntactic grounds usually turned out to entail relatively patient-like meanings for their arguments […], while those argued to be syntactically unergative were usually agentive in meaning.” (Dowty, 1991, p. 605). That is, the unaccusative hypothesis predicts that the difference in the understood semantic interpretation of the single argument *John* in (4-a) and (4-b) correlates with a difference in the grammatical relation between the single argument and the verb. *John* is the grammatical subject and the semantic Agent of the event described by the verb in (4-a) but the grammatical object and the semantic Patient of the event described by the verb in (4-b).

(4) a. John laughed.

b. John arrived.

Despite its fundamental and productive role in linguistic theorizing, the nature and scope of the unaccusativity hypothesis has turned out to be difficult to determine. If the unaccusativity hypothesis is a semantic characterization of intransitive verbs, then it is a question why cross-linguistically the same verb, – e.g. *bluten* (‘to bleed’) – behaves syntactically as unergative in German but as unaccusative in Turkish and Eastern Pomo (cp. (Rosen, 1984)), an observation which has been considered as providing evidence for a purely syntactic interpretation of the unaccusativity hypothesis. But if the unaccusativity hypothesis is a purely syntactic characterization of intransitive verbs, then it is a question why within a language like German (cp. Zaenen (1988) for Dutch) a verb like *bluten* ‘to bleed’ selects *haben* as a perfect auxiliary but does not license an impersonal passive – see (5).

(5) a. *Es wurde geblutet.
    it be.AUX.PASS bleed
    ‘It was bled.’

b. Sie hat geblutet.
    she have.AUX bleed.PRS.PRF
    ‘She has bled.’
Perlmutter, taking into account only impersonal passives as a syntactic representation of unaccusativity, concludes that verbs like *bluten* are unaccusative. In contrast, Zaenen (1988) argues that verbs like *bluten* induce a syntactic ‘unaccusativity mismatch’ between impersonal passive formation and auxiliary selection. She argues that impersonal passives require protagonist control over the event described. As verbs like *bluten* are generally non-agentive, she concludes that verbs like *bluten* are unergative but preclude impersonal passives for reasons independent of the unaccusativity hypothesis. Zaenen proposes a three-way semantic classification of intransitive verbs in place of the two-way syntactic classification assumed by Perlmutter’s hypothesis. Unaccusative verbs are telic and non-agentive. The classical examples of unergative verbs are atelic and agentive in the strong sense that the agent is assumed to have control over the event described by the verb. And there is a second type of unergative verbs, exemplified by Verbs like *to glow* or *to bleed* that are also atelic but where the grammatical subject does not have control over the event described and thus is not an Agent. This third semantic class of intransitive verbs is often referred to as the class of ‘Emission Verbs’, reminiscent of Perlmutter’s characterization of these verbs as “non-voluntary emissions of stimuli that impinge on the senses” (Perlmutter, 1978, p. 163). Emission Verbs as in (6) describe events in which the single argument produces or emits a certain sound, light, smell or substance (Levin and Rappaport Hovav, 1995, p. 91).

(6) a. Sound: burble, buzz, clang, crackle, hoot, hum, jingle, moan, ring, roar, whir, whistle,…
   b. Light: flash, flicker, gleam, glitter, shimmer, shine, sparkle, twinkle,…
   c. Smell: reek, smell, stink
   d. Substance: bubble, gush, ooze, puff, spew, spout, squirt,…

While general agreement has been reached concerning the syntactic unergativity of Emission Verbs (see e.g. Levin and Rappaport Hovav (1995) for an overview), the semantic characterization of Emission Verbs has been subject to debate. According to Zaenen’s cross-classification of intransitive verbs by agency and telicity, there are three semantic classes of intransitive verbs. But then there can be no one-to-one correlation between the two syntactic classes of intransitives and the three semantic classes of intransitives. In order to maintain the claim that the syntactic split of intransitives correlates with a uniform semantic characterization of unergatives and unaccusatives, Levin and Rappaport Hovav (1995); Rappaport Hovav and Levin (2000) (henceforth LRH) propose to replace the criterion of whether or not a process is easy to control with one involving causal properties of events. Unergative verbs describe internally caused eventualities in which inherent properties of the single argument like will, volition, emotion or physical characteristics are ”‘responsible’ for bringing about the eventuality” (Levin and Rappaport Hovav, 1995, p. 91) that the verb describes. Unaccusative verbs describe externally caused eventualities for which an agent, an instrument, a natural force or a circumstance has ”immediate control over bringing about the eventuality described by the verb” (Levin and Rappaport Hovav, 1995, p. 91).

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4 The fourth class of intransitives arising from this semantic cross-classification are telic agentive verbs like *to sit up* or *to lay down* which according to (Rappaport Hovav and Levin, 2000) are unergative verbs.
92). Given this reconceptualization of the semantic features of unaccusativity, LRH propose to analyze Emission Verbs as unergative verbs that describe internally caused eventualities which "come about as a result of internal physical characteristics of their argument" (Levin and Rappaport Hovav, 1995, p. 92). Accordingly, a diamond would glow because it has the necessary physical properties to do so. However, an appropriate configuration of physical properties in the single argument of an Emission Verb is a necessary, but not a sufficient condition for bringing about the eventuality described. This fact has been emphasized in the analysis of Emission Verbs pursued in Reinhart (2002). She argues that Emission Verbs are 'Theme unergatives', a class of syntactically unergative verbs that are semantically indistinct from externally caused unaccusatives. In her analysis, unaccusatives and Theme unergatives both select for internal arguments that are specified in the conceptual system with the feature [-cause change]. Reinhart’s punchline is that Emission Verbs are externally caused because “the event described by the unergative derivation the diamond glowed could not have just come about without some source of light - the ‘external cause’ of the glowing” (Reinhart, 2002, p. 281).

The special semantic status of Emission Verbs is reinforced by the fact that regardless of whether the semantics of Emission Verbs is assumed to be determined by causal properties of the event (as in LRH) or by the conceptual system (as in Reinhart), Emission Verbs are unwieldy. In the analysis of LRH, internal properties of the emitter argument do “not distinguish a glowing event from an event of a glass breaking – the glass has some fragility property that enables it to break.” (Reinhart, 2002, p. 282). In Reinhart’s approach, “the question remains how the CS [the conceptual system] distinguishes” (Reinhart, 2002, p. 245) between unaccusative verbs and Emission Verbs if both select for arguments that are specified for [-cause change].

The point of this introduction on the unaccusativity mismatch represented by Emission Verbs is to motivate the main goal of this paper: a reanalysis of Emission Verbs that combines and extends the main insights from the literature. I follow Zaenen in arguing that Emission Verbs semantically constitute a third distinct class of intransitives. But I will extend what sets Emission Verbs semantically apart from unergatives and unaccusatives to the syntax, by proposing a syntactic structure of Emission Verbs that also differs from those for the other two intransitive verb classes of unergatives and unaccusatives. I argue that an appropriate semantic analysis of Emission Verbs should combine the insights of LRH and Reinhart in that Emission Verbs describe a causal relation in which internal causation of an emission (of light, blood) conditionally depends on external causation (a source of light, a lesion).

3 Introducing Dispositions

Given the general acceptance of Emission Verbs being syntactically unergative, the main challenge is their semantic determination. As a starting point, recall the diametrically opposed views on the semantics of Emission Verbs in the literature that I alluded to in the introduction. LRH advance an internal causation analysis of Emission Verbs whereas Reinhart puts forward an external causation analysis of Emission Verbs. The goal of this section is to argue that the events described by Emission Verbs
pertains to a complex causal structure which involves both an external causal factor and a causally relevant internal physical structure. That is, the events described by Emission Verbs result from the interaction of properties inherent in the emitter argument and an external causal factor. LRH and Reinhart each describe just one part of this causal complex, thus both failing to capture its essential complexity, of internal causality as dependent on external causality. Notably, a closer look at the way in which LRH and Reinhart describe Emission Verbs shows that neither approach actually endorses a purely internal or external causation analysis. On the one hand, LRH propose that in Emission Verbs a “reaction of the argument is the source of the eventuality” (Rappaport Hovav and Levin, 2000, p. 287). But a reaction is a response to external circumstances and thus cannot be just a matter of internal causation. On the other hand, Reinhart admits that “it is true that diamonds [...] have some internal property that enables them to glow” (Reinhart, 2002, p. 281). Thus, a glowing event cannot be just a matter of external causation, as it is only internal properties of a diamond that enable it to glow.

The semantic characterization of the events described by Emission Verbs as resulting from the interaction between internal and external causal factors exhibits an intriguing parallel to the semantics of adjectives like fragile. Fragility is an internal physical characteristic of an object but fragility can have causal effects only if certain external circumstances obtain. A vase does not break just because of its being fragile but only when it is e.g. struck. In philosophy, the meaning of adjectives like fragile is standardly explained by invoking the concept of a disposition (Choi (2012)). Dispositions described by adjectives like fragile are properties that reside in an object. Only when appropriate external circumstances obtain is the disposition activated and manifests itself in the production of a certain effect. 

\[(7) \quad x \text{ is fragile} \rightarrow x \text{ is disposed to break when struck, where} \quad \text{‘x is disposed to break when struck’ is true iff x has an intrinsic property in virtue of which it breaks when struck’(?, cp. p. 70)}\]

When applied to Emission Verbs, Farra’s disposition ascription schema provides a strikingly adequate characterization of the inherent property of the single argument to glow that combines the two diametrically opposed perspectives on Emission Verbs put forward in the work of LRH and Reinhart. Consider (8).

\[(8) \quad x \text{ is disposed to glow when light falls on it, where} \quad \text{‘x is disposed to glow when light falls on it’ is true iff x has an intrinsic property in virtue of which it glows when light falls on it.}\]

(8) captures that a diamond glows in virtue of its intrinsic properties, as in the analysis of LRH. It also accounts for Reinhart’s insight that the realization of the diamond’s

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5 One reason for why a dispositional analysis of Emission Verbs has slipped the attention may be that philosophical investigations of dispositions like Farra’s focus on dispositional adjectives like fragile. Emission Verbs do not license such dispositional adjectives, as cross-linguistically only verbs with a transitive usage license dispositional adjectives (Olta-Massuet, 2013).
disposition to glow requires a causal factor external to the diamond. The event de-
notation of Emission Verbs like to glow emerges when the disposition of the emitter
argument manifests itself in the presence of appropriate external circumstances, so-
called stimulus conditions. The analysis of a verbal construction like x glowed that I
am going to elaborate in the following is thus the one in (9).

(9) x glowed → (x is disposed to glow when light fell on x)\textsubscript{D} and
     (light fell on x)\textsubscript{C}

x glowed entails that (a) x is the bearer of a dispositional property (represented by
the clause D in (9)) and (b) those stimulus conditions obtained in the presence of
which the disposition of x would manifest itself (represented by the clause C in (9))\textsuperscript{6}. Tying in with the general issue of thematic roles brought up in the introduction, the
fact that both internal and external causal factors are involved in the events described
by Emission Verbs sets apart the thematic interpretation of emitter arguments from
[+cause change] Agent arguments of internally caused unergative verbs and [-cause
change] Patient argument of externally caused unaccusative verbs. On the one hand,
the single argument of an Emission Verb behaves like a Patient (and corresponds to
the grammatical object of a transitive verb) insofar the realization of the disposition
inherent in the single argument requires external circumstances to ‘operate’ on the
disposition. On the other, when the disposition of the emitter argument realizes, the
emitter argument behaves like an Agent (and corresponds to the grammatical subject
of a transitive verb) in that it produces that effect which counts as the manifestation
of the disposition residing in the single argument of the Emission Verb. Before ad-
dressing the thematic interpretation of emitter arguments in detail, in the next section
I argue that Emission Verbs are not only semantically but also syntactically different
from unaccusatives and unergatives.

4 Nominalizations of Emission Verbs

In this section, I argue that Emission Verbs are syntactically distinct from both unerga-
tives and unaccusative verbs by setting the positive syntactic evidence for the unerga-
tivity of Emission Verbs side by side with positive syntactic evidence pointing to the
unaccusativity of Emission Verbs. I emphasize ‘positive evidence’ because, as Za-
enen argued, negative evidence for the non-unergativity of Emission Verbs such as
the lack of impersonal passives is inconclusive. The relevant observation I use for a
positive characterization of Emission Verbs as unaccusative verbs is that it “has been
noted in the literature that across languages event nominals are, when derived from
transitive predicates, ‘passive’ and not transitive and that they are derived from unac-
cusative predicates, but not from unergative ones” (Alexiadou, 2001, p. 78), where the
term ‘derived event nominal’ pertains to a narrowly defined class of nominalizations.

\textsuperscript{6} To avoid misunderstanding, please note that I refer to specific stimulus conditions C as in (9) in an
illustrative manner only. To discuss manifestations of dispositions as in (9), reference to stimulus condi-
tions is inevitable but naming specific stimulus conditions is insofar an oversimplification as in general, a
large number of (combinations) of different dispositions and causal factors interact in the production of a
certain effect that counts as the manifestation of the disposition in question.
Derived event nominals are nominalizations that are derived with overt nominalizer morphemes such as -ion in English or -ung in German. Accordingly, -ing Gerunds in English and zero-derived infinitival nominalizations are not derived event nominals. If unaccusative verbs but not unergative verbs license derived event nominalizations, then the licensing of derived event nominalizations can be used as a test for whether a verb is unaccusative or unergative. As an illustration of Alexiadou’s generalization, consider the contrast between the unaccusative verbs to explode and to arrive and their German counterparts explodieren and ankommen on the one hand and the unergative verbs to laugh and to work and their German counterparts lachen and arbeiten in (10) on the other.

(10) a. the arrival of the guest
    b. the explosion of the bomb
    c. *the laughion
    d. *the workion
    e. die Ankunft des Gastes
       the arrive.unft.NMLZ the GEN guest
       ‘the arrival of the guest’
    f. die Explosion der Bombe
       the explode.ion.NMLZ the GEN bomb
       ‘the explosion of the bomb’
    g. *die Lachung
       the laugh.ung.NMLZ
       ‘the laughing’
    h. *die Arbeitung
       the work.ung.NMLZ
       ‘the working’

According to Alexiadou’s generalization, if Emission Verbs are syntactically unergative, we expect that they lack derived event nominalizations. This expectation is difficult to evaluate for English nominalizations for two reasons. First, nominalization in English is productive only for -ing gerunds and zero-derived infinitival nominalizations (cp. Alexiadou (2001)), both of which do not count as derived nominalizations and thus are not included in Alexiadou’s generalization. Second, the straightforward and relatively reliable diagnostics with perfect auxiliary selection is not available in English. Thus, I focus in the following on German data as in (11) and use English data as in (12) only for illustrative purposes.

(11) zucken (‘to convulse’), strahlen (‘to radiate’), bluten (‘to bleed’), keimen (‘to germinate’), wuchern (‘to grow exorbitantly’), wirken (‘to take effect’), schwanken (‘to vacillate, to stagger’), schwellen (‘to swell’), strömen (‘to flow’), . . .

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7 Examples for non-existent words are always delicate. Nevertheless, I decided to illustrate the lack of derived event nominalizations from unergatives by presenting made-up examples with the nominalizer suffixes -ion for English and -ung for German.
(12) to convulse, to radiate, to ulcerate, to pullulate, to hibernate, to oscillate, to vacillate, …

Syntactically, the German verbs in (11) behave like Emission Verbs. They select haben as an auxiliary but do not license impersonal passives, see (13).

(13) a. *Es wurde gewirkt.
   it be.AUX.PASS take effect
   ‘It was taken effect.’
   b. Die Tablette hat gewirkt.
   the pill have.AUX take-effect.PRS.PRF
   ‘The pill has taken effect.’

I will therefore take the verbs in (11) (and (12)) to all belong to the class of Emission Verbs in an extended sense, according to which such verbs describe the emission or production of certain effects. In some cases the emission is of light, sound or smell, but the emitted effects can also be of other sorts.

The prediction that Emission Verbs do no have derived event nominalizations is not borne out. Contrary to what would be expected according to the cross-linguistic generalization of Alexiadou, (14) shows that the Emission Verbs in (11) (and (12)) license derived event-denoting ung-nominalizations (and ion-nominalizations). Event denotation of nominals is traditionally diagnosed e.g. by the possibility of ‘verb-like’ modification of the nominal with adverbials such as constant (Grimshaw, 1990; Alexiadou, 2001), compare the standard example Prüfung (14-a) (and examination (14-e)).

(14) a. die andauernde Prüfung des Studenten
   the constant examine.ung.NMLZ the.GEN student
   ‘the constant examination of the student’
   b. die andauernde Strahlung des Caesiums
   the constant radiate.ung.NMLZ the.GEN caesium
   ‘the constant radiation of the caesium’
   c. die andauernde Wirkung der Tablette
   the constant effect.ung.NMLZ the.GEN pill
   ‘the constant effect of the pill’
   d. die andauernde Strömung der Donau
   the constant flow.ung.NMLZ the.GEN danube
   ‘the constant flow of the danube’
   e. the constant examination of the student
   f. the constant convulsion of the muscle
   g. the constant radiation of the caesium
   h. the constant oscillation of the pole

8 Here, and in the following, to hibernate is understood as referring to a state of inactivity and metabolic depression of endotherms (but not in its metaphorical use that refers to energy saving in computers).

9 The other main standard adverbial diagnostics for event denotation in nominals – event modification with frequent – is ruled out for Emission Verb nominals by independent considerations about dispositions: often dispositions can manifest themselves only once (e.g. the taking-effect of a pill) and thus the events that count as a manifestation of the disposition cannot be repeated.
Given that unaccusatives but not unergatives license derived event nominalizations, the data in (14) provides positive evidence for Emission Verbs being syntactically unaccusative. But tests like auxiliary selection indicate the syntactic unergativity of Emission Verbs. Thus, I conclude that Emission Verbs are syntactically neither (or both) unaccusative and unergative. The special syntactic behaviour of Emission Verbs correlates well with the special semantics of Emission Verbs I argued for in the last section, according to which Emission Verbs are semantically neither (or both) unaccusative and unergative. The next section develops an analysis of Emission Verbs that accounts for the special syntax and semantics.

5 Emission Verbs at the Syntax-Semantics Interface

To approach an analysis of Emission Verbs that does justice to their special syntax and semantics, I consider the formation of German -ung-nominalizations in more detail. In two broadly conceived studies Roßdeutscher (2010) and Roßdeutscher and Kamp (2010) establish two general constraints on the formation of ung-nominalizations. The first constraint supports my claim that Emission Verbs are neither unaccusative nor unergative: intransitive German verbs generally “do not have ung-nominals; this is the case irrespective of whether the verb is unergative (15), unaccusative (16) or non-core-transitive (17) in the sense of Levin (1999)” (Roßdeutscher and Kamp, 2010, p. 176).

(15) a. lachen
    laugh
    ‘to laugh’
    b. *die Lachung
    the laugh.ung.NMLZ
    ‘the laughing’

(16) a. ankommen
    arrive
    ‘to arrive’
    b. *die Ankommung
    the arrive.ung.NMLZ
    ‘the arrival’

(17) a. (einen Brief) schreiben
    (a letter) write
    ‘to write (a letter)’
    b. *die Schreibung
    the write.ung.NMLZ
    ‘the writing’

The second constraint points towards the internal structure of Emission Verbs. (Roßdeutscher, 2010, p. 106) argues that “a verbal construction has an -ung nominalization if and only if the verb is constructed bi-eventively”, where the term ‘bi-eventive’ is construed syntactically as in Marantz (2005). Adopting Distributed Morphology (Halle and Marantz, 1993) as a framework, Marantz proposes that in a mono-eventive construction the root √ modifies the verbalizer v as in (18-b), whereas in a bi-eventive construction, a morphologically empty verbalizer v is merged with a small clause SC denoting a stative property as in (18-a).
Semantically, mono-eventive verbs are atelic descriptions of the manner of an event, whereas bi-eventive verbs are telic descriptions of the result state that is caused by an event. According to LRH (see e.g. (Rappaport Hovav and Levin, 2010)), this dichotomy is a general principle underlying the lexical semantics of verbs. According to the hypothesis of ‘Manner-Result-Complementarity’, verbs either name the manner of an event and are atelic or name the result of an event and are telic. Accordingly, unergatives verbs are telic and name the manner of an internally caused event whereas unaccusatives verbs are telic and name the result of an externally caused event. If Emission Verbs have a bi-eventive construction so as to license -ung-non-inalizations, this raises the question how it can be that Emission Verbs by themselves behave like atelic verbs, given that verbs with a bi-eventive construction are generally telic (whereas not all verbs with a telic reading are bi-eventive, see the non-core transitive examples in (17)). From what I said so far about the dispositional semantics of Emission Verbs – Emission Verbs are neither internally nor externally caused – it appears that Emission Verbs escape Manner-Result-Complementarity in a distinct way. Emission Verbs describe events in which a result state (the manifestation of the disposition) temporally coincides with and is conceptually indistinguishable from the manner of producing that effect which counts as the manifestation of the disposition in question. On the one hand, characterizing Emission Verbs as atelic event descriptions thus falls short of acknowledging that the event described by an Emission Verb is the result state of the manifestation of a disposition. On the other, Emission Verbs are not telic event descriptions in that the result state is realized by a process. Concluding, Emission Verbs are special in that they can have a bi-eventive construction (in which the result state is the manifestation of the disposition of the emitter argument) and at the same be atelic event descriptions (because the manifestation of the disposition is a process).

I argued that the semantic relation between an Emission Verb and its single argument escapes an analysis in terms of cause-effect relations but that Emission Verbs describe manifestations of dispositional properties residing in the emitter argument. As the standard inventory of thematic roles is defined with respect to relations between cause and effect – i.e. causal properties of events – but not dispositional properties of objects, an appropriate thematic analysis of emitter arguments requires to extend the domain of definition of thematic roles from cause-effect relations to dispositional causal relations. The extension I propose considers emitter arguments to be a ‘Medium’ in which a disposition resides and in which the disposition (through the production of a certain effect) manifests itself. The attribution of the Medium role thus differs importantly from the attribution of event-based thematic roles like
Agent or Patient. For dispositions exist even when they are unrealized, the Medium role does not presuppose participation in an event. This is different for thematic roles like Agent or Patient, which characterize two different types of participation in an event. E.g., in Dowty’s theory of thematic proto-roles verbal entailments about Agent arguments are “volitional involvement in the event” or “causing an event” whereas the Patient argument “undergoes change of state” or is “causally affected by another participant” (Dowty, 1991, p. 572). In a manner of speaking, the use of an Emission Verb to describe a certain situation is felicitous only if the emitter argument has that dispositional property the manifestation of which produces the effect the Emission Verb describes. That is, in Emission Verbs the event described is characterized by entailments of the dispositional property of the emitter argument whereas in unergative and unaccusative verbs the event described is characterized by entailments of the verb. The grammatical relevance of the dispositional property of the emitter argument is obvious from “[t]he strong restrictions that these verbs impose on its emitter argument” (Rappaport Hovav and Levin, 2000, p. 287). For example, Resnik (1996) argues that the strength of selection restrictions in a given verb correlates with the proportion of information contributed by that verb and its internal argument. The stronger selection restrictions the verb imposes on its internal argument, the more information about the event described by the verb is encoded in the argument. Put in plain words, the event of a diamond’s glowing is an inherent part of the conceptualization of the properties of a diamond because the event described by the diamond glowed is the manifestation of the diamond’s dispositional property to glow when light falls on it. To assign a Medium interpretation to emitter arguments systematically, I employ a syntactic approach to argument structure in which argument structure is determined by structural positions in the syntax rather than lexicalized theta-grids (see e.g. Harley (2011) for an overview). The exemplary syntactic structure of an unaccusative verb is given in (19), the exemplary syntactic structure of an unergative verb in (20). The Patient role (of unaccusatives) is assigned to the specifier position of the complement of vP, a predicative small clause (SC), the Agent role (of unergatives) is assigned to the specifier position of Voice.

If the Medium argument is neither (or both) an Agent and a Patient, and Emission Verbs are neither (or both) unergative and unaccusative, the appropriate syntactic position to assign the Medium role should be a combination of (19) and (20) in one structural analysis of an intransitive verb. More precisely, the syntactic position to which the Medium role is assigned should be a position which is both the specifier position of Voice and the specifier position of the complement XP of vP. As stacking the unergative structure on top of the unaccusative analysis yields a prototypical transitive verb, the remaining option is to place the unergative structure below the unaccusative structure, yielding an intransitive analysis as in (21).
An analysis of the argument structure of Emission Verbs with (21) predicts that (im-
personal) passive formation is impossible when a passive is realized by a Voice head
that does not project a specifier and thus is different from that Voice head that projects
a specifier in (21). Given that different Voice heads cannot be stacked (Schäfer, 2008),
Emission Verbs cannot be passivized. As in German, the presence of Voice has been
argued to correlate with the selection of haben as an auxiliary in perfect formation
(Schäfer, 2008), (21) also correctly predicts auxiliary selection. As such, (21) cor-
rectly predicts the two main syntactic properties of Emission Verbs. There is a further
semantic prediction of (21). The introduction of the Voice projection in the unerga-
tive analysis (20) has been motivated by the observation that fixed meaning only
occurs with internal arguments of transitive verbs, but never with external arguments
(Kratzer, 1996). In syntactic approaches to word formation like Distributed Morphol-
ogy, the Voice projection has been thus been identified as demarcating the boundary
of the syntactic derivation of verb-argument constructions in which a particular inter-
nal argument induces the fixed meaning. Accordingly, (21) correctly predicts strong
semantic restrictions on appropriate single arguments, which I argued to be seman-
tically determined by the dispositional property of the emitter argument. Taking the
correct predictions of the analysis as motivating a further exploration of (21) as the
syntactic structure of Emission Verbs, next I discuss the semantic interpretation of
(21), which I illustrate with the example of the German Emission Verb wirken (‘to
take effect’) as in (22).

(22) Die Tablette wirkte.
    the pill take effect
    ‘The pill took effect.’

The attention of philosophers and linguists alike has mainly focused on unrealized
dispositions, e.g. those properties described by dispositional adjectives like fragile.
But Emission Verbs describe manifestations of dispositions. Thus, the main focus of
this section is on the semantic modeling of the manifestation relation between the
dispositional property of a emitter argument and its stimulus conditions rather than
the appropriate analysis of unrealized dispositions. To keep my semantic analysis of
the manifestation relation independent of specific assumptions about the appropriate
metaphysical characterization of unrealized dispositions, I make the perhaps grossly
simplifying assumption that dispositional properties are ontological primitives (like
events, where it is model-theoretically irrelevant whether events are metaphysically
perceived as in Davidson (1970), Kim (1976) or Lewis (1986), for example). In fact,
I adopted the analysis of ? not for its metaphysical plausibility but only because it
correlates well with the paraphrases of the meaning of Emission Verbs provided
in the work of LRH and Reinhart. But nothing speaks against adopting a different
metaphysical characterization of unrealized dispositions such as the traditional coun-
terfactual analysis endorsed e.g. in Ryle (1949); Goodman (1954); Quine (1960) or
recent proposals like Vetter (2014) or Maier (2016).

To model the manifestation relation between an unrealized disposition and its
stimulus conditions I employ linear logic as presented in Steedman (2002). Steedman
uses linear logic implication ‘−→’ to build the ‘update’ effects of events directly in
the representation. The distinct feature of the linear logic implication ‘−→’ is that it
can only be used once. When the implication rule is applied, the antecedent of the
implication is deleted. For example, (23) represents events which involve a door in a
world where the door can be in two states – open or shut – and where the only action
that the door affords is pushing. When the door is shut and pushed, it becomes open
and the antecedent condition that it is shut is deleted. If the door is open and it is
pushed, it becomes shut and the antecedent condition that it is open is deleted.

(23) a. shut(door) −→ [push(door)\open(door)]
b. open(door) −→ [push(door)\shut(door)]

The two states of the door in (23) are connected by a necessary causal accessibility
relation between possible worlds in which the door is closed or open. This relation
– labeled as ‘pushing the door’ – is represented by the dynamic box operator ‘[]’, a
function from possible worlds to possible worlds.

Using (23) as a blueprint, I model the relation between the disposition p of an
emitter argument and its manifestation event e as a relation R of necessary causal ac-
cessibility between a possible world w_1 in which p is unrealized and a possible world
w_2 in which p manifested itself. I label the relation R as ‘the stimulus conditions C
for the dispositional property p residing in the emitter argument obtain’ and represent
R with the dynamic box operator ‘[]’. The resulting analysis of the relation between
the emitter disposition and its manifestation is given in (24) for the example of the
German Emission Verb wirken (‘to take effect’).

(24) \(\text{wirk}(p) \land \text{MEDIUM}(x)(p))[]C \rightarrow \text{wirk}(p) \land \text{MEDIUM}(x)(p) \land \text{MANIFEST}(e)(p)\)

I use the conceptually primitive predicate ‘MANIFEST(e, p)’ in the consequent of (24)
to indicate that the event e is the manifestation of the disposition p. In plain words,
(24) characterizes the relation between the disposition of the emitter argument and its
manifestation as follows: ‘if x is the medium in which the dispositional property p
resides (where p is the disposition to take effect when C), then, when C obtains,
the dispositional property p of x manifests itself as an event e of p-ing.’.

The analysis of the meaning of wirken in (24) anticipates the semantic atelicity
and syntactic bi-eventivity of Emission Verbs. First, when C obtains, the antecedent
of (24) is deleted and the consequent denotes a property of events, which accounts
for Emission Verbs being atelic event descriptions. Second, because in a bi-eventive
construction the verbalizer is morphologically empty (recall (18-a)), the root \(\sqrt{\text{wirk}}\)
must enter the derivation at a position below the verbalizer and then incorporate into
the verbalizer via head movement (Travis, 1984). Consequently, the semantic func-
tion of the verbal root √wirk cannot be to modify an event. Instead, as in (24), √wirk introduces a dispositional property \( p \), the realization of which constitutes the (result) state required for the bi-eventive construction. In a system of indirect interpretation, where a translation function \( T \) assigns expressions of an extensional typed \( \lambda \)-calculus to (the roots of) expressions of natural languages, we may thus define the denotation of the root √wirk of wirken as in a (25).

(25) \[ T(√wirk) = \lambda p. \text{wirk}(p) \]

The entry point for the root √wirk that offers itself in (21) is – following the account of primary merge in Van Craenenbroeck and De Belder (2015) – as an adjunct of Voice, such that Voice becomes the syntactic categorizer of √wirk. According to (21), Voice projects a Medium argument in its specifier and predicates the specifier to be the bearer of a dispositional property \( p \) as in (26).

(26) \[ T(\text{Voice}) = \lambda x. \lambda p. \text{MEDIUM}(x)(p) \]

Interpreting the first projection of (21) with (25) and (26) yields the interpretation of Voice’ in (27).

(27) \[
\begin{array}{c}
\text{Voice’} \\
\lambda x. \lambda p. \text{wirk}(p) \land \text{MEDIUM}(x)(p)
\end{array}
\]

\[
\begin{array}{ccc}
\text{Voice} & \text{√wirk} \\
\lambda x. \lambda p. \text{MEDIUM}(x)(p) & \lambda p. \text{wirk}(p)
\end{array}
\]

In (27), the denotation of Voice is combined with the property denotation of √wirk by function conjunction. Formally, assuming that dispositional properties are of type \( p \), individuals are of type \( e \) and truth-values are of type \( t \), function conjunction is a composition rule that takes two functions \( f_1 = \langle p, t \rangle \) and \( f_2 = \langle e, \langle p, t \rangle \rangle \) as input and outputs the conjunction of \( f_1 \) and \( f_2 \), a function \( f_3 \) of type \( \langle e, \langle p, t \rangle \rangle \). Moving up in the syntactic structure (21), the next interpretation step in (28) is functional application of the emitter DP die Tablette ('the pill') to the denotation of Voice’ derived in (27). The resulting denotation of VoiceP – a function \( \langle p, t \rangle \) – provides the dispositional antecedent of (24).

(28) \[
\begin{array}{c}
\text{VoiceP} \\
\lambda p. \text{wirk}(p) \land \text{MEDIUM}(\text{the – pill})(p)
\end{array}
\]

\[
\begin{array}{ccc}
\text{DP} & \text{Voice’} \\
\text{Die Tablette the – pill} & \lambda x. \lambda p. \text{wirk}(p) \land \text{MEDIUM}(x)(p)
\end{array}
\]

Moving up in the structure (21), the semantic function of the verbalizer v is to introduce the event argument of the verb (recall the bi-eventive structure (18-a)). According to (24), the event argument is accessible only if the stimulus conditions \( C \)
obtain. Thus, we might posit that for the verbalizer $v$ to introduce the event argument, $C$ must obtain. If $C$ obtains at $v$, the antecedent of (24) is deleted and the consequent determines the disposition of the emitter argument to have manifested itself. We thus predict that later stages of the derivation cannot describe the unrealized disposition of the emitter argument. As the nP hosting the nominalizer morpheme *ung* is inserted immediately above the vP projection in (21) (see e.g. (Roßdeutscher and Kamp, 2010)), Emission Verb nominals provide a suitable test case for this prediction. I assess whether Emission Verb nominals *Wirkung* can denote the unrealized disposition of the emitter argument with two tests that are standardly taken to target properties (but not events). First, comparative constructions like *mehr als* (‘more than’) (Kennedy and Levin, 2008), see e.g. the example in (29).

(29) Ein Sauternes hat mehr Süße als ein Chardonnay.
    a sauternes has more sweet.NMLZ than a Chardonnay
    ‘A sauternes has more sweet than a Chardonnay.’

When *Wirkung* appears in a comparative construction as in (30), the dispositional property – the potential effect – of the pill is compared with that of a Placebo without presupposing that the pill or the Placebo has been ingested. Thus, *Wirkung* in (30) denotes the unrealized disposition of the emitter argument.

(30) Diese Tablette hat mehr Wirkung als ein Placebo.
    this pill has more effect.ung.NMLZ than the placebo
    ‘This pill is more effective than the placebo’

The second test I use draws upon the fact that properties but not events can be lost. In (31) the pill is asserted to lose its disposition to take effect when ingested, notably without requiring that the pill has been ingested. Thus, in (31) *Wirkung* denotes the disposition residing in the emitter argument.

(31) Diese Tablette verliert ihre Wirkung nach Ablauf des Mindesthaltbarkeitsdatums.
    this pill loose its effect.ung.NMLZ after expiration the.GEN minimum durability date
    ‘The pill looses its effect after the expiration of the minimum durability date.’

Contrary to what a redemption of the implication (24) by $v$ would predict, the data in (30) and (31) strongly suggests that Emission Verb nominals like *Wirkung* can denote the unrealized dispositional property of the emitter argument (although dispositional readings of Emission Verb nominals may not always be as readily available as for *Wirkung*). To account for this, I propose that the semantic function of the verbalizer $v$ is to relate the denotation of VoiceP to the consequent of (24) with linear logic implication and the dynamic box operator as in (32).

\[
T(v) = \lambda Q_{(p,t)}. \exists p [Q(p)] \rightarrow \lambda e. \exists p [Q(p) \land \text{MANIFEST}(e)(p)]
\]

The denotation of the verbalizer $v$ in (32) takes as an input a function $(p,t)$ – the denotation of VoiceP – and returns the implication scheme (24) as the denotation
of vP. The denotation of vP is obtained by functional application of the denotation of VoiceP to the denotation of v as in (33).

(33) \( \lambda Q_{(p,t)} \exists p[Q(p)] [C] \rightarrow \lambda e. \exists p[Q(p) \land \text{MANIFEST}(e)(p)] \)
\( (\lambda p. \text{wirk}(p) \land \text{MEDIUM}(\text{the} \rightarrow \text{pill})(p)) \)

Executing functional application in (33) yields (34).

(34) \( \exists p[(\lambda p. \text{wirk}(p) \land \text{MEDIUM}(\text{the} \rightarrow \text{pill})(p))(p)] [C] \rightarrow \lambda e. \exists p[(\lambda p. \text{wirk}(p) \land \text{MEDIUM}(\text{the} \rightarrow \text{pill})(p))(p) \land \text{MANIFEST}(e)(p)] \)

Applying \( \lambda \)-conversion to the antecedent and consequent of (34) yields the denotation of vP in (35).

(35) \( \exists p[\text{wirk}(p) \land \text{MEDIUM}(p) \land (\text{the} \rightarrow \text{pill})(p)] [C] \rightarrow \lambda e. \exists p[\text{wirk}(p) \land \text{MEDIUM}(\text{the} \rightarrow \text{pill})(p) \land \text{MANIFEST}(e)(p)] \)

If Emission Verb nominals such as Wirkung can have a reading in which the implication denoted by vP is not redeemed, then there is no dedicated stage of the semantic interpretation of extensions of (35) where the implication denoted by vP is redeemed. Instead, the event argument in the consequent of the vP denotation is ‘unlocked’ if those extensions of vP that demand access to the event argument presuppose that the stimulus conditions C obtain. For example, the past tense interpretation of the Emission Verb wirken as in (22) presupposes that the stimulus condition C obtain, for otherwise there is no event of the pill’s taking effect that can be located in time. But when C is granted to obtain, the antecedent of the implication (24) is deleted and the consequent denotes a property of events that can be existentialized and located in time by a (simplified) past tense operator as in (36).

(36) \( T(\text{Past}) = \lambda P_{(s,t)} \exists e[P(e) \land \text{past}(e)] \)

Concluding, functional application of the consequent of the vP semantics in (35) to (36) followed by \( \lambda \)-conversion yields the desired logical form of (22) in (37), according to which the event described by (22) is the manifestation of the dispositional property to take effect (when ingested) residing in the Medium argument.

(37) \( \exists e \exists p[\text{wirk}(p) \land \text{MEDIUM}(p) \land (\text{the} \rightarrow \text{pill}) \land \text{MANIFEST}(e)(p) \land \text{past}(e)] \)

6 Summary and Outlook

In this paper, I developed an analysis of Emission Verbs at the syntax-semantics interface that does justice to their distinct syntactic and semantic behavior. As announced
in the introduction, I argued that the thematic role of emitter arguments is not understood with respect to causal properties of the event described but with respect to causal properties of the emitter argument that manifest themselves when appropriate external circumstances obtain. According to my account of Emission Verbs, they are a third distinct class of intransitives besides unergatives and unaccusatives. Accordingly, the mixed results of syntactic unaccusativity diagnostics systematically single out Emission Verbs from the class of intransitives: in German, Emission Verbs are intransitive verbs that select haben as a perfect auxiliary and do not license impersonal passives.

A question that arises from the conclusion that Emission Verbs are distinct from the other two types of intransitive verbs is how this relates to the ‘unaccusativity hypothesis’ about intransitives. The answer to this question depends on what exactly one takes to be the ‘unaccusativity hypothesis’. If the ‘unaccusativity hypothesis’ amounts to the original hypothesis put forward in Perlmutter (1978) that there are two classes of intransitives distinguished by whether an intransitive verb has an impersonal passive or not, then the ‘unaccusativity hypothesis’ is not affected by the argument of this paper. Emission Verbs do not form impersonal passives and thus pattern with unaccusatives, just as in Perlmutter’s original proposal. If the ‘unaccusativity hypothesis’ refers to the hypothesis that there are two classes of intransitive verbs distinguished by the formation of impersonal passives and other diagnostics such as perfect auxiliary selection, then there are three syntactically distinct classes of intransitive verbs instead of two, just as in my analysis. If, as Zaenen (1988) proposed, only the semantics of Emission Verbs is taken into account, Emission Verbs differ from unergatives and unaccusatives all the more. If, as in Chierchia (2004), the domain of definition of the ‘unaccusativity hypothesis’ is extended from strictly intransitive verbs (as in the work of Perlmutter and Zaenen) to intransitive verbs that alternate with a transitive usage, then Emission Verbs per se are problematic, because generally Emission Verbs do no alternate with a transitive usage nor do they syntactically or semantically pattern with the two classes of unaccusative and unergative verbs predicted by Chierchia’s approach. Nevertheless, I would like to point out that the analysis of Emission Verbs I proposed may well extend to transitive constructions. A particularly telling example are those unexpected cases where Emission Verbs alternate with a transitive construction such as to blossom in (38).

(38) Early summer heat blossomed fruit trees across the valley.  
(Rappaport Hovav, 2014, p. 13)

German blühen (‘to blossom’) behaves like an Emission Verb in that it selects haben as a perfect auxiliary (39-a) and lacks an impersonal passive (39-b). However, unlike English to blossom, blühen does not have a transitive usage (39-c).

(39) a. Die Blume hat geblüht.  
the flower have.AUX blossom.PRS.PRF  
‘The flower blossomed.’

b. *Es wurde geblüht.  
it be.AUX.PASS blossom  
‘It was blossomed.’
c. *Die Sommerhitze blühte die Blumen.
   The summer heat blossomed the flowers
   ‘The summer heat blossomed the flowers.’

Even if the transitive usage of *to blossom* may be a peculiarity of English, it corroborates the analysis of Emission Verbs put forward in this paper. The relevant observation is that the grammatical subject of the transitive usage of *to blossom* is semantically restricted to what Rappaport Hovav (2014) calls ‘ambient conditions’ and excludes Agents and Instruments, see (40).

(40) *The farmer/*the new fertilizer blossomed the fruit trees.
   (Rappaport Hovav, 2014, p. 13)

Data as in (38) and (40) is problematic for both LRH and Reinhart, as LRH would predict that *to blossom* is internally caused and thus cannot appear as the grammatical object of a transitive construction, whereas Reinhart’s feature system fails to account for the fact that Agents and Instruments are excluded as grammatical subjects of *to blossom* but not ‘ambient conditions’. In the approach of Emission Verbs developed in this paper, the data in (38) and (40) has a straightforward explanation if *x blossomed* is analyzed as the manifestation of a dispositional causal relation as in (41).

(41) *x blossomed* → (x is disposed to blossom when the temperature is high enough)D and (the temperature is high enough)C

The restriction on ‘ambient conditions’ as the grammatical subject of the transitive usage of *to blossom* is predicted by (41) because the ‘ambient conditions’ are nothing but the stimulus conditions for the disposition inherent in the emitter argument, and neither a farmer nor new fertilizer are suitable stimulus conditions C for the disposition to blossom when C. That is, if there is a transitive construction with an Emission Verb, then my analysis predicts that those stimulus conditions appear as the grammatical subject in the presence of which the disposition of the emitter argument manifests itself. Even if the phenomenon illustrated by the transitive usage of *to blossom* is marginal, the semantic restriction of the grammatical subject of *to blossom* in (38) by the dispositional property of the emitter argument shows that dispositional causal relations may well be involved outside the closed world of those strictly intransitive constructions I considered in this paper.

Concluding, if the analysis of Emission Verbs I proposed is on the right track, then Emission Verbs provide evidence that dispositional properties are an integral constituent of the metaphysics of natural language in the sense of Bach (1986). Consequently, I believe that when taking into account that there may be more to causality than just cause-effect relations, more phenomena of the type exemplified by Emission Verbs will become visible to us.

References


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