

Dispositions and the verbal description of their manifestations: a case study on Emission Verbs

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Abstract

The present paper argues that when thematic roles are restricted to judgments about *causal properties* of *events*, this falls short of accounting for cases where thematic roles reflect judgments about *dispositional properties* of *objects*. I develop my argument with a case study on a class of 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 residing in the emitter argument. The paper develops a lexical-semantic analysis of Emission Verbs according to which the event described by an Emission Verb is the manifestation of the dispositional property of the emitter argument when appropriate external circumstances obtain. The paper concludes by outlining how the proposed dispositional analysis of Emission Verbs may inform the analysis of transitivity alternations like the causative alternation and the middle construction.

1 Introduction: Intransitivity and Causation

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 the so-called causative alternation (1-a)/(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

¹Jackendoff (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.

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 central aim of the present paper is to put yet a further issue about thematic roles on the research agenda. I argue that when thematic roles are restricted to human judgments about causal properties of *events*, this falls short of accounting for cases where thematic roles reflect human judgments about causal properties of *objects*. I develop my argument with an in-depth study of a class of intransitive verbs that have been called ‘Emission Verbs’. I introduce Emission Verbs in the next subsection against the background of the so-called unaccusativity hypothesis put forward in Perlmutter (1978).

1.1 The unaccusativity hypothesis

According to the unaccusativity 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. Wunderlich (1985) (and in a generative syntax approach also e.g. 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 represented³. First –

²A telling example of disagreement is the question 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.

³The two tests for unaccusativity I present in this introduction are the most reliable systematic syntactic indicators of unaccusativity in German. Other established tests like the licensing of prenominal participles provide only a negative characterization of Emission Verbs, which are the

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 become.AUX.PASS laugh.PRS.PRF
‘It was laughed.’
b. *Es wurde angekommen.
it become.AUX.PASS arrive.PRS.PRF
‘*It was arrived.’

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.PRS.PRF
‘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.

focus of the present paper.

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 become.AUX.PASS bleed.PRS.PRF
 ‘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 Agent⁴. 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,...

1.2 An unaccusativity mismatch: Emission Verbs

While general agreement seems to exist 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) and 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”

⁴The 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.

(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. 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].

1.3 Outline and goals of the paper

The point of this introduction on the unaccusativity mismatch represented by Emission Verbs is to motivate the goal of the present paper: a reanalysis of Emission Verbs that combines and extends the main insights from the literature. To me (and also to one of the reviewers), it appears that the controversy about Emission Verbs arises to some degree as a consequence of the rather informal articulation of the semantic claims that RHL and Reinhart put forward, and to some degree because of the natural limitations that a restriction of the conceptual tools of analysis to events of actual causation brings with it. One reason for Emission Verbs being a persistent problem in lexical semantics may be that Emission Verbs are standardly not considered as a problem *sui generis* but rather as a marginal exception to the unaccusativity hypothesis, and thus can simply be explained away. I maintain the contrary and argue that the tables should be turned with respect to Emission Verbs. That is, argue that the analysis of Emission Verbs is a semantic problem of its own that cannot be reduced to being an outlier of an analysis in terms of external and internal causation or [+/-cause change] roles. Moreover, I believe that the close inspection of Emission Verbs carried out in the present paper reveals insights about event structure and thematic roles that reach beyond the narrowly circumscribed phenomenon of Emission Verbs but may inform the analysis of other linguistic phenomena that have proved to be notoriously difficult to analyze within established conceptual dichotomies like that of RHL's distinction between external and internal causation or Reinhart's [+/-cause change] roles.

The paper is structured as follows. In section 2 I examine in more detail the lexical semantics of Emission Verbs by considering the semantic properties of nominalizations derived from Emission Verbs. In section 3 I propose to accommodate the conflicting semantic properties of Emission Verbs within an analysis according to which the events described by Emission Verbs designate 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. I argue that 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 its single argument is determined by causal properties of events. In section 4 I account for the distinct semantics of Emission Verbs by introducing a thematic role I call ‘Medium’. Being assigned the Medium role entails that the Emission Verb the Medium is an argument of describes the manifestation event of a disposition residing in the Medium. Because for dispositions to manifest themselves certain external circumstances have to obtain (e.g. a source of light is required for a diamond to glow) I argue that Emission Verbs are semantically transitive and that emitter arguments that are assigned the Medium thematic role are internal arguments of the Emission Verb. I support my proposal by considering cases in which Emission Verbs participate in transitive constructions. In section 5 I outline in broad strokes how the proposed dispositional analysis of Emission Verbs may inform the debate surrounding the causative alternation (as in (1)) and middle constructions (like *this book reads easily*). I conclude in section 6.

2 Sharpening the view on Emission Verbs

In this section I examine in more detail the conflicting properties of Emission Verbs by considering nominalizations derived from Emission Verbs.

2.1 Nominalization and unaccusativity

A well-known correlation between unaccusativity and nominalization is that unergative but not unaccusative verbs license *-er* nominalizations as in (7) (see Wunderlich (1985) for German, Levin and Rappaport (1988) for English).

- (7) a. Tänzer, Arbeiter, Träumer
 dancer, worker, dreamer
 b. *Faller, *Einschläfer, *Ankommer
 *faller, *asleeper, *arriver

But nominalizations are related to unaccusativity also in a more involved way. Grimshaw (1990) argued that nominalization is a process akin to passivization, i.e. just as in a passive construction, the nominalization of a transitive verb like *to examine* in (8-a) demotes the grammatical subject of the transitive verb, see (8-b).

- (8) a. The doctor examined the patients for a long time.
b. The examination of the patients took a long time.

The lack of an external argument in passive constructions and nominalizations suggests a close parallel of these constructions with unaccusative verbs that similarly have an internal but no external argument. The relation between passive constructions and unaccusative verbs has been explored in detail with respect to the so-called causative alternation (see e.g. Levin and Rappaport Hovav (1995, ch. 3) for a detailed analysis and Schäfer (2009) for an overview). I return to the causative alternation in section 5.1. The relation between derived nominalizations and unaccusative verbs has been examined in Alexiadou (2001) for a wide range of Indo-European languages. Alexiadou concludes that the underlying verbal phrase of deverbal nominalizations has an unaccusative structure from which an external argument is absent: “across languages event nominals are, when derived from transitive predicates, ‘passive’ and not transitive and [...] they are derived from unaccusative predicates, but not from unergative ones” (Alexiadou, 2001, p. 78). Imanishi (2014) formulates this constraint on the structure of deverbal nominalizations as ‘the unaccusative requirement on nominalization’, according to which “nominalized verbs must lack an external argument” (Imanishi, 2014, p. 123). Two qualifications must be made with respect to the unaccusative requirement on nominalization. First, the constraint applies to nominalizations that are derived from a verb with an overt nominalizer morpheme like English *-ion* but not to English *-ing of* Gerunds or zero-derived nominals like *a walk*. Second, the constraint applies only to nominalizations which denote an event. This second qualification is necessary in particular because many derived nominalizations are ambiguous between what Grimshaw (1990) calls a ‘complex event’ interpretation that allows for ‘verb-like’ modification of the nominal with adverbials such as *constant* or *frequent* as in (9-a) and a non-eventive ‘result’ interpretation that appears in contexts such as (9-b).

- (9) a. The frequent examination of the patient was time-consuming.
b. The examination is on the table.

A direct consequence of the unaccusative requirement is that post-nominal geni-

tives correspond to the grammatical object of the transitive verb and thus receive a Patient interpretation. Admittedly, there are cases where a non-Patient interpretation of post-nominal genitives is possible, as in (10), but for the present purposes the important point is that a Patient interpretation of the genitive argument of derived nominalizations is always available.

(10) The interrogation of the police took three days.

In what follows, I use the unaccusative requirement as a diagnostics for the verbal structure of Emission Verbs. To this end, I consider a set of verbs that are not listed as Emission Verbs in Levin and Rappaport Hovav (1995) but exhibit the same behavior with respect to the syntactic diagnostics of unaccusativity. The verbs I would like to consider in more detail are the German verbs in (11) and the English verbs in (12).

(11) wirken ('to take effect'), strahlen ('to radiate'), bluten ('to bleed'), zucken ('to twitch'), wuchern ('to grow exorbitantly'), keimen ('to germinate'), schwanken ('to vacillate, to stagger'), strömen ('to stream')...

(12) to convulse, to radiate, to ulcerate, to pullulate, to hibernate⁵, to oscillate, to vacillate, ...

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

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

As is well known (see e.g. Hoekstra and Moulder (1990)), auxiliary selection in languages like Dutch or German interacts with the telicity of an event description,

⁵Here, 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).

in particular when the verb in question describes a motion event and when the motion is further characterized by a prepositional phrase. Thus, some variation in judgments of auxiliary selection in Emission Verbs that describe a motion of the single argument like e.g. *schwanken* ('to oscillate') or *strömen* ('to stream') is to be expected. To rule out this potential point of confusion, I develop the details of the analysis in the next subsection 2.2 with the example of two of the German verbs in (11) that unambiguously select *haben* as an auxiliary: *wirken* ('to take effect') and *strahlen* ('to radiate'). This being said, I 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 (as in the classification of LRH), but the emitted effects can also be of other sorts. The verbs in (11) and (12) are telling because they license derived event nominalizations and thus can be subjected to the unaccusative requirement. (14) shows that German Emission Verbs can license derived event-denoting *ung*-nominalizations, and this observation holds for all the verbs listed in (11). (15) shows that English Emission Verbs can license derived event-denoting *ion*-nominalizations. Again, this observation obtains for all the verbs in (12)⁶.

- (14) a. die andauernde Strahlung des Caesiums
 the constant radiate.ung-NMLZ the.GEN caesium
 'the constant radiation of the caesium'
- b. die andauernde Wirkung der Tablette
 the constant effect.ung-NMLZ the.GEN pill
 'the constant effect of the pill'
- c. die andauernde Strömung der Donau
 the constant stream.ung-NMLZ the.GEN danube
 'the constant stream of the danube'
- (15) a. the constant convulsion of the muscle
 b. the constant radiation of the caesium

⁶I use modification with *constant* as a diagnostics for event denotation because the other main standard adverbial diagnostics for event denotation of nominals – event modification with *frequent* – is ruled out for Emission Verb nominals by independent considerations. The events described by Emission Verbs like e.g. *wirken* – the taking effect of a pill – cannot be repeated because for the pill to take effect it has to dissolve, and thus can happen only once (see also footnote 9).

- c. the constant oscillation of the pole

Given the unaccusative requirement, the fact that Emission Verbs can license derived event nominalizations is unexpected if Emission Verbs are syntactically unergative verbs, as is commonly assumed in the literature. That is, when the unaccusative requirement obtains, nominalizations of Emission Verbs provide positive evidence against an unergative analysis of Emission Verbs. I emphasize ‘positive evidence’ because, as Zaenen argued, negative evidence for the non-nergativity of Emission Verbs such as the lack of impersonal passives is inconclusive. But derived event nominalizations of Emission Verbs also provide positive evidence against an unaccusative analysis of Emission Verbs. The post-nominal genitive clearly does not allow for a Patient interpretation, as would be expected if the underlying verbal phrase of a nominalization has an unaccusative structure. The licensing of derived non-Patient event-denoting nominalizations by Emission Verbs as in (14)/(15) suggests that Emission Verbs are neither unaccusative nor unergative. This conclusion is reinforced by the fact that intransitive German verbs generally “do not have *ung*-nominals; this is the case irrespective of whether the verb is unergative, [or] unaccusative” (Roßdeutscher and Kamp, 2010, p. 176), cp. (16).

- (16) a. *die Lachung
the laugh.ung-NMLZ
‘the laughing’
b. *die Ankommung
the arrive.ung-NMLZ
‘the arrival’

Derived event-denoting Emission Verb nominalizations thus make linguistically explicit the contradiction that their analysis involves, in particular with respect to the question whether Emission Verbs are unaccusative or unergative. But derived event-denoting Emission Verb nominalizations are also telling with respect to the semantic analysis of Emission Verbs.

Roßdeutscher and Kamp (2010) argue that a verb has an *-ung* nominalization if and only if the verb is constructed bi-eventively. A bi-eventive verb describes a relation between two events, e_1 and e_2 , where e_1 (a CAUSE event) causes a

change of state event e_2 (a BECOME event), see e.g. Dowty (1979) for discussion. Bi-eventivity is thus to be understood in contrast to mono-eventivity, which is associated with verbs that describe an activity, i.e. a single event e (a DO event). Roßdeutscher and Kamp (2010) construe bi-eventivity in a syntactic approach to word formation, but their constraint on the formation of *ung*-nominalizations can be reformulated without further commitments to a particular theory of word formation in terms of the established distinction between ‘manner’ and ‘result’ verbs. Rappaport Hovav and Levin (2010) distinguish two broad semantic classes of verbs. The first class of verbs encodes the manner in which some action is carried out and describes internally caused events. The second class encodes the coming about of some particular result state and describes externally caused events. According to the analysis of RHL, unergative verbs are internally caused and thus are prototypically manner verbs, whereas unaccusative and transitive verbs are externally caused and thus are prototypically result verbs Levin and Rappaport Hovav (1995). Against these background assumptions, the generalization of Roßdeutscher and Kamp (2010) amounts to the claim that only transitive result verbs but not manner verbs license *ung*-nominalizations. E.g., the verb *säubern* (‘to clean’) in (17-a) is a result verb. It predicates a change from dirty to clean of the obligatory direct object. Consequently, *säubern* has an *ung*-nominalization, see (17-b).

- (17) a. Peter säuberte den Tisch.
 ‘Peter cleaned the table.’
 b. Die Säuberung des Tisches
 the clean.ung-NMLZ the.GEN table
 ‘The cleaning of the table’

An important qualification of the claim that only transitive result verbs license *ung*-nominalizations is that the transitivity requirement is understood in a strong sense that excludes verbs like *essen* (‘to eat’) in (18) that participate in the unspecified object alternation (18-a)/(18-b).

- (18) a. Peter aß.
 ‘Peter ate.’
 b. Peter aß den Apfel

‘Peter ate the apple.’

- c. *Die Essung des Apfels
the eat.ung-NMLZ the.GEN apple

Example (18-b) may appear like a perfect instance of a transitive description of a change of state in the sense that Peter’s eating causes the apple to undergo a change of state from being not eaten to being eaten. But despite their superficial resemblance with transitive result verbs, verbs that participate in the unspecified object alternation, typically so-called ‘incremental theme verbs’, have been argued to be manner verbs (Rappaport Hovav, 2008), with the transitive construction being constructed out of the manner verb (see e.g. Kratzer (2004); Kennedy (2012)). I mention this additional qualification of core-transitivity (in the terminology of Kratzer (2005), see also Levin (1999) for discussion) with respect to the constraint on the formation of *ung*-nominalizations, because the core-transitive result requirement is an additional constraint to take into account when approaching the lexical semantics of Emission Verbs. On the one hand, the fact that Emission Verbs license *ung*-nominalizations suggests that Emission Verbs semantically behave like core-transitive result verbs⁷. But on the other, in the literature Emission Verbs are considered to be syntactically and semantically intransitive. Moreover, the availability of *ung*-nominalizations derived from Emission Verbs provides support for Reinhart’s analysis of Emission Verbs as being semantically unaccusative and externally caused but speaks against the analysis of RHL according to which Emission Verbs are unergative internally caused manner verbs. But at the same time, the fact that the genitive argument of Emission Verb nominalizations cannot be interpreted as a Patient also shows that Reinhart’s analysis of Emission Verbs as ‘theme unergatives’ cannot be right.

⁷A possible objection to this conclusion might point out that the licensing conditions for *ung*-nominalizations changed over time (Demske, 2002) and thus the availability of Emission Verb nominalizations is just a diachronic accident. But this objection begs the question for why in present day German, only Emission Verbs but not unaccusative and unergative verbs can license *ung*-nominalizations.

2.2 Emission Verbs, Nominalization and Reification

The second respect in which nominalizations are highly diagnostic with respect to Emission Verbs is an intriguing semantic effect of nominalization that has been popularized by the analysis of the logical form of action sentences put forward in Davidson (1967). Consider the sentence in (19-a) and the nominalization in (19-b).

- (19) a. Amundsen flew to the North pole.
b. A flight by Amundsen to the North pole.

Following Davidson, (19-a) and (19-b) describe the same flying action of Amundsen. But the noun phrase *a flight* in (19-b) expresses existential quantification over the event of Amundsen's flight. (19-a) can be interpreted as describing this same event but arguable in no other sense than that the event is the ground for the sentence's truth. That is, that part of the world that is responsible for the truth of (19-a) is the very same that is responsible for the truth of (19-b). But the logical form of (19-a) treats the relevant part of reality as an instance of a quantifying expression, one where members can be the values of variables that can be bound by quantifiers over that domain. This process – of transforming a sentence whose truth is grounded in the existence of some event into one containing a variable that can take this event as a value – was referred to as *reification* in Reichenbach (1947). The semantic effect of reification makes nominalization a valuable tool for the inspection of verb meaning, because it makes explicit the implicit 'non-referential' components of a verb's meaning in a way that the verb by itself does not.

We already saw that many derived nominalizations are ambiguous with respect to what they denote, e.g. with respect to Grimshaw's distinction between complex event nominals and result nominals. But the ontology of denotations of nominalizations is more complicated, and this is true in particular of German *ung-*nominalizations (Bierwisch, 1989). (14) and (15) showed that nominalizations of Emission Verbs are compatible with verb-like aspectual modification, thus indicating that Emission Verb nominalizations can denote events. One test that is standardly taken to target properties (but not events) is the licensing of compar-

ative constructions like *mehr als* ('more than) (Kennedy and Levin, 2008) as in (20).

- (20) 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.'

Interestingly, Emission Verb nominalizations can not only denote an event, but also a property. For example, *Wirkung* ('taking-effect') and *Strahlung* ('radiation') are compatible with a comparative construction as in (21)/(22) and thus the nominalizations in (21)/(22) denote a property but not an event. And notably, for (21)/(22) to be true, it is not required that there exists an event where the pill actually took effect or where the vacuum cleaner is in operation.

- (21) 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'
- (22) Jeder Staubsauger hat mehr Strahlung als ein
every vacuum cleaner has more radiate.ung-NMLZ than a
Batteriekabel.
battery cable
'Every vacuum cleaner has more radiation than a battery cable.'⁸

The second test I use to narrow down the semantics of Emission Verbs draws upon the fact that properties but not events can be lost. In (23) the pill is asserted to loose its effect, and in (24) the radioactive waste is asserted to loose its radiation. Notably, for (23) to be true it is not required that there is an event in which the pill took effect.

- (23) Diese Tablette verliert ihre Wirkung nach Ablauf des
this pill loose its effect.ung-NMLZ after expiration the.GEN
Mindesthaltbarkeitsdatums
minimum durability date
'The pill loses its effect after the expiration of the minimum durability date.'

⁸<http://www.manager-magazin.de/unternehmen/artikel/a-182499.html> last accessed March 19, 2018

- (24) Der Atommüll verliert seine Strahlung langsam.
the radioactive waste loose its radiate.ung-NMLZ slowly
'The radioactive waste loses its radiation slowly'

Given that reification is a valid method for the inspection of verb meaning, we can conclude from data as in (21)/(22) and (23)/(24) that the implicit truth-makers of Emission Verbs include a property residing in the emitter argument. That is, Emission Verbs involve not only a non-referential event argument (as is standardly assumed in the tradition of Davidson) but also a non-referential property argument. The involvement of a non-referential property argument in the semantics of Emission Verbs seems in fact quite plausible in view of the characterization that LRH provide of Emission Verbs, i.e. that “a property inherent in the emitter argument is responsible for bringing about the event described”. But although the property residing in an emitter argument is obviously central to the analysis of Emission Verbs, the way in which the property that resides in emitter arguments is involved in the event described by Emission Verbs fits with none of the established conceptions of internally vs. externally caused events or [+/-cause change] roles. To make more precise why and how this is the case, in the next section I assess the special role and nature of the property argument of Emission Verbs and their nominalizations in more detail.

3 Introducing Dispositions

As a starting point, recall the contradictory semantics of Emission Verbs that I outlined in the introduction and strengthened in the previous section. Basically, LRH advance an internal causation analysis of Emission Verbs whereas Reinhart puts forward an external causation analysis of Emission Verbs. In this section, I argue that the events described by Emission Verbs pertain to a complex causal structure which involves both an external causal factor and a causally relevant internal physical structure and thus 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, 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 goal of this section is to introduce a concept of causation that accommodates the conflicting views on Emission Verbs in the literature.

I motivate my proposal for the semantic characterization of the events described by Emission Verbs as resulting from the interaction between internal and external causal factors by considering an intriguing parallel of the property residing in the emitter argument and properties ascribed to objects with adjectives like *fragile*. Fragility is a property inherent in an object but fragility is causally efficacious only if certain external circumstances obtain. On the one hand, a vase does not shatter just because of its being fragile but only when it is struck appropriately. On the other, a vase does shatter when struck only when it is fragile. In philosophy, properties ascribed by adjectives like *fragile* are called ‘dispositional properties’. What sets apart dispositional properties described by adjectives like *fragile* from other properties predicated with adjectives of color, weight or shape metaphysically is that although being fragile seems to be “a perfectly real property, a genuine respect of similarity common to glasses, china cups, and anything else fragile” (Choi and Fara, 2012), the truth of statements like *this vase is fragile* seems to have to do only with the *potential* of the vase to shatter when certain conditions obtain but nothing about the *actual* behavior of the vase is necessary for it to be fragile.

Dispositional properties have a ‘characteristic manifestation’ (e.g. the event of the vase’s shattering) when certain ‘stimulus conditions’ (e.g. the appropriate striking of the vase) obtain. Following Choi and Fara (2012), I distinguish two ways of referring to dispositional properties with natural language expressions. Adjectives like *fragile* are ‘conventional’ dispositional predicates: they designate

a dispositional property with a simple predicate but do not make explicit the characteristic manifestation and stimulus conditions of the dispositional property designated. In contrast, statements as in (25) are ‘canonical’ disposition descriptions, where *x* is a noun phrase, *V* is a verb and *C* is a sentence.

(25) *x* is disposed to *V* when *C*

Canonical disposition descriptions identify the characteristic manifestation of a dispositional property (the event denoted by *V*) and the stimulus conditions (the state of affairs expressed by the sentence *C*) of a dispositional property residing in the object *x* but do not designate that dispositional property. Conventional and canonical dispositions are closely related to each other, as the meaning of a conventional disposition description like *x is fragile* can be explicated through the analysis of the corresponding canonical form (Lewis, 1997). That is, one way to explain the meaning of conventional disposition ascriptions is to first translate the conventional disposition description to its canonical form by specifying the characteristic manifestations and stimulus conditions of the conventional disposition. In a second step, the meaning of the conventional disposition description is explicated through the analysis of the truth-conditions of the canonical translation. For example, Fara (2005) proposes to explain the meaning of the conventional dispositional description *x is fragile* in terms of the truth-conditions of the corresponding canonical form as in (26).

(26) ‘*x* is disposed to break when struck’ is true iff *x* has an intrinsic property in virtue of which it breaks when struck (Fara, 2005, cp. p. 70)

It is when the characteristic manifestation *V* of the canonical form of disposition ascriptions is designated by an Emission Verb like *to glow* and when the stimulus conditions *C* are equated with a description of an external causal factor (as in Reinhart’s analysis) that the truth conditions of the canonical form provide a strikingly adequate characterization of the inherent property of emitter arguments, see (27).

(27) ‘*x* is disposed to glow when illuminated’ is true iff *x* has an intrinsic property in virtue of which it glows when illuminated.

(27) accommodates the two diametrically opposed perspectives on Emission Verbs put forward in the work of LRH and Reinhart. On the one hand, (27) captures that a diamond glows in virtue of its intrinsic properties, as in the analysis of LRH. On the other, it also accounts for Reinhart’s insight that the realization of the diamond’s disposition to glow requires a causal factor external to the diamond. I chose (26) as an example analysis of the canonical form of dispositions because its phrasing matches perfectly well with the way in which Emission Verbs are characterized in the work of LRH and Reinhart. But in fact, Fara’s proposal is just one but many proposals put forward in the philosophical literature for how the truth-conditions of canonical disposition ascriptions are to be spelled out. A widely held competing view about the analysis of canonical dispositions like *x is disposed to shatter when struck* is to analyze canonical dispositions in terms of “a counterfactual statement along these general lines: If this glass had been suitably struck, then this striking would have caused the glass to shatter” (Armstrong, 1996, p. 115) as in (28).

(28) ‘x is disposed to V when C’ iff x would V if it were the case that C

The counterfactual analysis seems to characterize the dispositional property residing in emitter arguments equally well, see (29).

(29) ‘x is disposed to glow when illuminated’ iff x would glow if it were the case that x is illuminated

The issue at stake when deciding between different analyses of canonical disposition descriptions are examples which render one side of the bi-conditional in (28) true but the other side false. One example in case are so-called ‘finked’ dispositions (Martin, 1994), where the stimulus conditions for a disposition are the same conditions under which the dispositions is acquired or lost. Consider a diamond that, if it were about to be illuminated, would transform into brick. This diamond is disposed to glow when illuminated, but it is not true that it would glow if illuminated. Another type of counterexamples to the counterfactual analysis are ‘masked’ dispositions (Johnston, 1992), where the manifestation of a disposition is inhibited. Consider a diamond that is put in a light-tight box. This diamond is disposed to glow when illuminated, but it is not true that it would glow when

illuminated because the box prevents this. Fara's proposal is to be understood as a reaction to such counterexamples to the counterfactual analysis. Fara argues to analyze the relation between manifestation and stimulus of a disposition not as a counterfactual relation but in terms of the habitual meaning of English present tense constructions like *x Vs* (but then again, it has been argued that habituais are semantically different from dispositions (Cohen, 2016)).

To explain what dispositions are by answering what it is for an object to have a certain disposition is a central concern of the philosophical analysis of dispositional properties. But the focus of the present paper is somewhat different. I aim at explaining the event denoted by an Emission Verbs as a manifestation of a disposition residing in the emitter argument. To this goal, the question when it is true that an object has a certain disposition is – if relevant at all – subsidiary. Because an Emission Verb like *to glow* denotes an actual glowing event, the emitter argument has to have that disposition which manifested itself in the event denoted by the Emission Verb in the presence of appropriate stimulus conditions. When *this diamond is glowing* describes the manifestation of the disposition of the diamond to glow when illuminated, this rules out that the diamond turned into brick, and it also rules out that the diamond does not glow because it has been packaged in light-tight material. Instead of asking what it is that an object has a certain disposition, the question that Emission Verbs raise is what it is that an event is the manifestation of a disposition. More precisely, the question which I consider to be central to the semantics of Emission Verbs is the following : What does it mean for an event to be the manifestation of a disposition to V when C, when V is an Emission Verb?

To see what answering this question amounts to, consider one more point at issue in the analysis of dispositional properties. The canonical form of disposition descriptions requires the determination of a characteristic manifestation and appropriate stimulus conditions. But determining the characteristic manifestation and appropriate stimulus conditions for a given conventional disposition is by no means a trivial task that is guaranteed to always succeed. In general, a large number of (combinations) of different dispositions and causal factors interact in the production of those stimulus conditions that are responsible for a certain effect that counts as the manifestation of the disposition in question. Thus, specific

stimulus conditions for a given disposition are often difficult to identify (e.g. the disposition of a drainpipe to leak). The problem does not arise when conventional disposition ascriptions are individuated just on the basis of their characteristic manifestation (see in particular Vetter (2014)). For example, Maier (2016) proposes a non-conditional analysis of conventional dispositions like *fragile*, the characteristic manifestation of which is the verb *to break* as in (30), using a modal analysis as in Kratzer (1981).

- (30) ‘x is fragile’ is true in a possible world w (with respect to some circumstantial modal base f and a stereotypical ordering source g) iff there is a world $u \in \cap f(w)$ sth.
- a. $\forall v \in \cap f(w), u \leq_{g(w)} v$
 - b. x is broken at u
- (Maier, 2016, cp. p. 449)

Emission Verbs escape an analysis as in (30). First, one reason for why ‘verbal’ dispositionality of the type exemplified by Emission Verbs might have slipped the attention of philosophers and linguists alike may be the fact that there is no conventional dispositional adjective **glowable* with the help of which we could ascribe the dispositional property characterized in (27) or (29) to a diamond. In fact, Emission Verbs generally do not license such dispositional *-ble* adjectives as cross-linguistically, only verbs with a transitive usage license dispositional adjectives (Oltra-Massuet, 2013). Thus, the disposition of emitter arguments can be linguistically expressed with a canonical disposition description but not with a conventional dispositional adjective. Second, and this point is closely related to the first, the derivation of dispositional adjectives from verbs is akin to the process of passivization (see e.g. Oltra-Massuet (2013) for a detailed analysis). Thus, it is not far to seek, as Maier does, to omit the role of the stimulus conditions in the truth-conditions of dispositional adjectives by positing that the “verb [to break] associated with the predicate [fragile] occurs in the passive voice: a glass is fragile only if there is a possible world at which it *is broken*” (Maier, 2016, p. 452). Such an analysis cannot be applied to the disposition of emitter arguments, as Emission Verbs resist passivization (**the diamond is glowled*) and, as the nominalization data clearly showed, emitter arguments cannot be understood as Patients.

In contrast to analyses like Maier's that aim at replacing the canonical analysis of dispositions, because the predicate *be disposed to V* that is central to the canonical analysis is compatible with V being an Emission Verb, *be disposed to V* appears to be 'neutral' with respect to the semantic interpretation it assigns to its grammatical subject. Thus, the canonical analysis of dispositions is better suited for the development of a semantic analysis of Emission Verbs than analyses like Maier's that rely on the possibility that the manifestation event is described by a verb that can be passivized. Tying in with the general issue of thematic roles brought up in the introduction, the fact that both internal and external causal factors interact in bringing about the event 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 arguments 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 as the manifestation of the disposition inherent in the single argument requires stimulus conditions to 'operate' on the disposition. On the other, when the disposition of the emitter argument manifests itself, 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. I capitalize on this observation about the dual role of emitter arguments in the next section 4.1.

In summary, the analysis of Emission Verbs like *to glow* I wanted to motivate in this section is the one in (31), where the event denoted by the verbal construction *x glows* is the manifestation of a dispositional property of the emitter argument *x* when appropriate stimulus conditions *C* obtain.

- (31) 'x glows' is true (ignoring tense and aspect) iff
- a. x has the disposition to glow when C and
 - b. it is the case that C.

As regards (31-a), I argued at length that the use of the canonical form is advised because only the canonical form is available and grammatical when the manifestation event is identified by an Emission Verb. Because Emission Verbs denote

actual events rather than dispositional properties (i) the emitter argument has to have the dispositional property identified by (31-a) (ii) appropriate stimulus conditions must have obtained (31-b) (iii) there is no reason to commit to a particular truth-conditional interpretation of (31-a), as the standard counterexamples to the counterfactual analysis do not apply when the manifestation is described by an Emission Verb.

As a preliminary to the development of a lexical semantic analysis of Emission Verbs based on (31) in the next section, next I reconsider the nominalization data brought up in section 2.2. One of the perplexing features of German *ung-*nominalizations of Emission Verbs like *Wirkung* ('taking effect') is that they can denote a property in the absence of an event. That is, the truth of sentences like (21) or (23) in which *Wirkung* denotes a property was said to not require that there exists an event where the pill actually took effect. From what has been said in the present section about dispositional properties, it should be evident that the property denoted by Emission Verb nominalizations like *Wirkung* is a dispositional property: a pill can have the disposition to take effect when ingested without ever being ingested, just like a vase can have the disposition to shatter when struck without ever being struck. As discussed in section 2.2, following Davidson's methodology for the introduction of the ontological category of events, I take the dispositional property denotation of Emission Verb nominalizations (like *Wirkung*) to indicate an implicit non-referential dispositional property argument in the lexical semantics of the base verb (i.e. *wirken*). Consequently, dispositional properties are part of what Bach (1986) called 'natural language metaphysics', i.e. the "kinds of things and relations" that one needs in order to "exhibit the structure of meanings that natural languages seem to have" (Bach, 1986, p. 573). An important constraint on metaphysics is ontological parsimony. Thus, one might wonder whether dispositional properties are metaphysically fundamental or whether they can be reduced to other ontological kinds of things and relations. For example, as a reviewer suggests, one might try to render the ontology of dispositional properties in terms of trope ontology (which has been popularized in formal semantics by Moltmann (2007) and subsequent work.). But any such attempt will raise deep philosophical questions e.g. about whether dispositions are universals or particulars or the (ir)reducibility of dispositions, metaphysical issues which I do not

dare to step into given the limitations and aims of the present paper (again, see Choi and Fara (2012) for an overview and e.g. Tugby (2013) for a specific argument against analyzing dispositions as tropes). Leaving a further exploration of the ontological nature of dispositions to future research, in this synoptic section I characterized dispositional properties according to the following dictum: “[t]he question we want to answer is ‘What is it to have such and such a disposition?’ ... The question we want to leave unsettled is ‘What *is* a disposition?’” (Lewis, 1997, cp. p. 151). This being said, I contend that the property residing in an emitter argument ‘responsible’ for bringing about the eventuality described is sufficiently circumscribed by (31).

4 The lexical semantics of Emission Verbs

The attention of philosophers and linguists alike has centered on unrealized dispositions, that is, those properties described by dispositional adjectives like *fragile*. But I purport that Emission Verbs describe a realized disposition, i.e. the manifestation event in which a dispositional property manifests itself. On these premises, in this section I elaborate on (i) the thematic interpretation of the single argument of Emission Verbs and (ii) the semantic modeling of the manifestation event that results from the interaction of a dispositional property and its stimulus conditions, notabene when the manifestation event is described by an Emission Verb.

4.1 Characterizing Medium arguments

As a first step towards the elaboration of the lexical semantics of Emission Verbs, in this subsection I discuss in more detail the thematic interpretation of the single arguments of Emission Verbs, which I propose to analyze in terms of a new thematic role I refer to as ‘Medium’. Previously, I argued that the semantic relation between an Emission Verb and its single argument escapes an analysis in terms of actual cause-effect relations because Emission Verbs describe manifestation events of dispositional properties residing in the emitter argument. As outlined in the introduction, the standard inventory of thematic roles is defined with respect to relations between cause and effect – i.e. causal properties of events –

but does not include causally efficacious dispositional properties of objects. An appropriate thematic analysis of emitter arguments thus 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. A Medium is an argument of a verb that bears a dispositional property, it is a dispositional property bearer. The attribution of the Medium role to an argument differs importantly from the attribution of event-based thematic roles like Agent or Patient. Because dispositional properties exist even when they are unrealized, the Medium role that is assigned to the single argument of Emission Verbs (and also to the genitive argument of their nominalizations) 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 actual event. For example, in the work of Dowty (see Dowty (1989, 1991) but also Beavers (2010)) thematic roles are defined in terms of “a set of entailments of a group of predicates with respect to one of the arguments of each” (Dowty, 1991, p. 552), where “the implication follows from the meaning of the predicate in question alone”. Prototypical entailments of a verb about Agent arguments include “volitional involvement in the event” or “causing an event” whereas prototypical verbal entailments about Patient arguments include “undergoes change of state” or is “causally affected by another participant” (Dowty, 1991, cp. p. 572). The Medium role can be characterized in terms of lexical entailment, too. But importantly, because dispositional properties do not have to manifest themselves to exist, the entailment that characterizes a Medium argument does not follow from the meaning of the Emission verb. On the contrary, the entailment relation is in the opposite direction: the event described by an Emission Verb is characterized by an entailment of its Medium argument. That is, possession of a dispositional property by the Medium argument characterizes the Emission verb as a description of that event that would take place if appropriate stimulus conditions for the disposition residing in the Medium argument obtained. One piece of evidence in favor of such an analysis of the lexical entailments that characterize the thematic role of Medium arguments of Emission Verbs comes from “[t]he strong restrictions that these verbs impose on its emitter

argument” (Rappaport Hovav and Levin, 2000, p. 287). 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. Concluding, I propose that the relevant entailment that characterizes the Medium role assigned to the single arguments of Emission Verbs is determined as in (32).

- (32) Being an argument x of an Emission Verb V entails that the event e described by V is the manifestation of a dispositional property p residing in x in the presence of appropriate stimulus conditions C .

For the sake of brevity, in what follows I represent the possession of a dispositional property by a Medium as a two place relation $V(p)(x)$ between a dispositional property p and an individual x , see (33).

- (33) $V(p)(x) \rightsquigarrow x$ is a Medium in which a dispositional property p resides, where p is the disposition to V when C .

I proposed to use ‘Medium’ as a label for the thematic role of single arguments of Emission Verbs, i.e. disposition bearers. In English the word ‘medium’ can be used to refer to the “condition or environment in which something may function or flourish” (cp. the Merriam-Webster entry for ‘medium’) and the modal enablement meaning of this characterization of the “prerequisites for functioning” captures quite well the role that the disposition of Medium arguments plays with respect to the events described by Emission Verbs. But ‘Medium’ also has a specifically linguistic meaning (see e.g. Kaufmann (2004) for a detailed discussion). First, ‘Medium’ can refer to the Germanic Middle construction (to which I return in section 5.2). Second, ‘Medium’ can refer to the morphological marker of a Middle construction, often a reflexive pronoun. Third, ‘Medium’ can also refer to a morphological category that encodes a certain Voice (a *genus verbi*). I

discuss Middle constructions and reflexive markers in more detail in section 5 and for now note that a characteristic feature of all the linguistic uses of ‘Medium’ is that the linguistic phenomena ‘Medium’ refers to are neither unambiguously active or passive, nor Agent or Patient. My choice of the term ‘Medium’ to refer to the thematic role of the single arguments of Emission Verbs is thus insofar justified as Medium arguments similarly cross-cut the distinction between active and passive Voice, or Agent and Patient. For example, Piñón (2001) notes about the thematic interpretation of Medium arguments for the example of the Emission Verb *to bloom* that “it seems plausible that if the roses bloom, then they are both the themes and the agents of the blooming” (Piñón, 2001, p. 359). The equivocal behavior of Medium arguments seems to be a direct consequence of their being dispositional property bearers. With respect to the fact that Medium arguments require external stimulus conditions to produce that effect which counts as the manifestation of the Medium’s disposition, Medium arguments behave like a Patient (as in Reinhart’s analysis) of constructions in passive Voice, but with respect to the fact that when the disposition of the Medium manifested itself it is responsible for the production of the manifestation event (as in LRH’s analysis), Medium arguments behave like the Agents of constructions in the active Voice. Thus, it is not surprising that Piñón (2001) finds it plausible that the arguments of Emission verbs are both Agents and Patients. I discuss the relation of Piñón’s observation and the involvement of dispositions in more detail in section 5.1.

Concluding, in this subsection I have motivated and introduced the Medium thematic role as a lexical entailment of the single argument of Emission Verbs that characterizes the event described by an Emission Verb as the manifestation of a dispositional property residing in the Medium. In the next subsection, I inspect more closely the events described by verbs the single argument of which is a Medium.

4.2 Characterizing Emission Verbs

The goal of this subsection is to model-theoretically characterize the manifestation event that results from the realization of a dispositional property when appropriate stimulus conditions obtain. To this end, I employ linear logic as presented in

Steedman (2002). Steedman uses linear logic implication ‘ \multimap ’ to build the ‘update’ effects of events directly in the representation. The distinct feature of the linear logic implication ‘ \multimap ’ is that it can only be used once. When the implication rule is applied, the antecedent of the implication is deleted. For example, (34) 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.

- (34) a. $shut(door) \multimap [push(door)]open(door)$
 b. $open(door) \multimap [push(door)]shut(door)$

The two states of the door in (34) 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 (34) as a blueprint, I model the relation between the disposition p of a Medium and its manifestation event e as a relation R of necessary causal accessibility 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 Medium obtain’ and represent R with the dynamic box operator ‘ $[]$ ’. The resulting analysis of the relation between the Medium disposition and its manifestation is given in (35) for the example of the dispositional property residing in the Medium argument x of *to glow*. I understand (35) to indicate the templatic event structure of an Emission Verbs in the sense of Levin and Rappaport Hovav (1995), where x is a Medium argument as defined in (33).

- (35) $glow(x) \rightsquigarrow (glow'(x)(p)) \multimap [C](glow'(x)(p) \wedge \text{MANIFEST}(e)(p))$

I use the conceptually primitive predicate ‘ $\text{MANIFEST}(e, p)$ ’ in the consequent of (35) to indicate that the event e is the manifestation of the disposition p . In plain words, (35) characterizes the relation between the disposition of the Medium argument and its manifestation as follows: ‘if x is the Medium in which the dis-

positional property p resides (where p is the disposition to glow when C), then, when C obtains, the dispositional property p of x manifests itself as an event e of glowing.’ When C obtains, the antecedent of (35) is deleted and the consequent denotes the event in which the disposition manifests itself⁹. But when and how are stimulus conditions C asserted to obtain? I approach this question in the next subsection by reconsidering the properties of Emission Verbs and their nominalizations as well as overt realizations of stimulus conditions in transitive constructions with Emission Verbs.

4.3 The presupposition of stimulus conditions in nominalizations

In section 2.2 I showed that German *ung*-nominalizations of Emission Verbs can denote properties in the absence of an event. Given that *ung*-nominalizations like *Wirkung* are derived from an underlying verb (i.e. *wirken*), the fact that *Wirkung* can denote the unrealized disposition of the emitter argument indicates that the underlying verb is associated with the description of a ‘possible’ event characterized by the implication scheme in (35) rather than the description of an actual event. If an Emission Verb like *wirken* would be associated with the actual event in which the disposition of the emitter argument manifested itself, then we are unable to account for the fact that *Wirkung* can denote the unrealized disposition. That is, to explain that *Wirkung* can denote the unrealized disposition of the emitter argument characterized by (35) we need to assume that the verb *wirken* does not posit that appropriate stimulus conditions C obtained in the presence of which the disposition of the emitter argument manifests itself. Consequently, I propose that the semantics of the verbal phrase consisting of *wirken* and the emitter argument is characterized by the implication scheme in (35). On these premises, I now consider the question when and how the stimulus conditions C are asserted and consequently, when and how the implication scheme in (35) is redeemed so as to

⁹There seems to be a difference between dispositions that can only manifest once (like the disposition of a pill) and dispositions that can manifest themselves more than once (like the disposition of a diamond to glow). One way to account for this difference would be to assume that dispositions of the latter but not of the former type persist in the emitter argument even after the manifestation event ended. I leave a detailed exploration of this difference to further research.

arrive at the description of an actual event.

The first case to be considered is the event denotation of Emission Verb nominalizations. If the verbal phrase that is nominalized denotes the implication scheme (35), and nominalization takes place immediately above VP, as is posited by the unaccusative requirement (see also (Roßdeutscher and Kamp, 2010) for a similar conclusion about German *ung*-nominalizations based on disjoint reference effects), then the linguistic locus where the implication scheme (35) is redeemed is the nominalizing morpheme. Nominalizer morphemes like *-ung* may thus be ambiguous with respect to whether or not they assert that the stimulus conditions *C* of the emitter disposition obtain. The ambiguity of a nominalization like *Wirkung* would then be disambiguated by the requirements of the contexts. When *Wirkung* is placed in a context that selects for an event denotation, like prenominal modification with *andauernd* ('constant'), the implication scheme (35) is redeemed so as to arrive at the required event denotation. And when *Wirkung* is placed in a context that selects for a property, then the implication scheme (35) is not redeemed and the nominalization denotes the unrealized disposition of the emitter argument. On this account of the different meanings of *Wirkung*, the assertion of whether or not *C* obtains may in fact not be hard-coded by the nominalizer morpheme but rather be due to the accommodation of the presuppositions of those predicates that take the nominalization as an argument (see e.g. Asher (2011) for such a presupposition-based view). That is, aspectual modifiers like *andauernd* presuppose that what is modified is an event, and for dispositions the accommodation of this presupposition amounts to positing that *C* obtains. In contrast, comparative constructions do not presuppose that what is compared are events, and thus it is not required that *C* obtains. I leave a further exploration of this line of thought to future research and next turn to the question how and when the implication scheme is redeemed when Emission Verbs are not nominalized but when the verbal spine is extended with further functional projections like Tense.

4.4 The assertion of stimulus conditions in verbs

To approach the question for when the event denotation of Emission Verbs is redeemed through the assertion that *C*, let me reemphasize an important feature

of the analysis of Emission Verbs I proposed: even when Emission Verbs are used in a syntactically intransitive construction, they are semantically transitive. The semantic transitivity of Emission Verbs is due to the fact that the dispositional property residing in the emitter argument is defined with respect to what would happen if stimulus conditions *C* obtain, where the stimulus conditions function as an implicit conceptual second argument of the Emission Verb. Evidence for this conceptual transitivity of Emission Verbs comes from those Emission Verbs that alternate with a transitive construction such as *to blossom* in (36).

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

German *blühen* ('to blossom') behaves like an Manifestation Verb in that it selects *haben* as a perfect auxiliary (37-a) and lacks an impersonal passive (37-b). However, unlike English *to blossom*, *blühen* does not have a transitive usage (37-c).

- (37) a. Die Blume hat geblüht.
 the flower have.AUX blossom.PRS.PRF
 'The flower blossomed.'
- b. *Es wurde geblüht.
 it become.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 English¹⁰, 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 (38).

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

¹⁰Most of the transitive constructions with Emission Verbs I discuss in the following are not available in German. One reason for this may be that unlike English, German has overt inchoative morphology like the (*v*)*er*-prefix, see e.g. Dewell (2015) for discussion.

Data as in (36) and (38) 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 (36) and (38) has a straightforward explanation if *x blossomed* is analyzed as the manifestation of the disposition residing in the fruit trees according to the now familiar pattern of the canonical analysis of dispositions in (39).

- (39) x blossoms is true iff
- a. x has the disposition to blossom when early summer heat obtains
 - b. early summer heat obtains

The restriction on 'ambient conditions' as the grammatical subject of the transitive usage of *to blossom* is predicted by (39) because the 'ambient conditions' are nothing but the stimulus conditions for the disposition inherent in the Medium argument *x*. Neither a farmer nor new fertilizer are suitable stimulus conditions *C* for the disposition of a fruit tree to blossom when *C*. As a reviewer points out, McKoon and MacFarland (2000) present a corpus study that shows that 21 of those verbs that Levin and Rappaport Hovav (1995) classify as internally caused Emission verbs have a transitive use (see also Wright (2002) for a similar point). Actually, according to McKoon and MacFarland, some internally caused Emission Verbs like *to erode* are more likely to occur in a transitive construction than in an intransitive use. In all of the transitive uses that McKoon and MacFarland (2000) discuss, the emitter argument is the grammatical object and by far the most subjects of transitive constructions with Emission Verbs in their corpus study are natural causes, i.e. what Rappaport Hovav (2014) describes as 'ambient conditions'. As an illustration, two examples similar to (39) are given in (40)/(41) (cp. McKoon and MacFarland (2000, p. 857)).

- (40) a. The tulips withered.
b. The late frost withered the tulips

- (41) a. The cider fermented.
 b. The yeast cultures fermented the cider.

Returning to the question for when and how stimulus conditions *C* are asserted, the fact that many (if not all) Emission Verbs have a transitive usage in which the grammatical subject – the external argument of the verb – designates the stimulus conditions supports an analysis according to which the linguistic locus where the implication scheme (35) is redeemed to arrive at an event denotation is that functional projection of the verbal spine that is standardly assumed to be responsible for the introduction of the external argument, i.e. a Voice projection that introduces the grammatical subject of transitive and unergative verbs (Kratzer, 1996). For transitive cases like (40)/(41), I propose that Voice projects a specifier the realization of which is semantically restricted to be an appropriate stimulus condition for the disposition residing in the Medium argument, for otherwise the verb would not denote an event. In turn, the transitive examples also show that the Medium argument of the lexical-semantic template (35) is syntactically linked as an internal argument of the Emission Verb. Emission Verbs are thus like unaccusatives in that their single argument is internal to the verb. But importantly, unlike unaccusatives, the single argument of Emission Verbs is not a Patient but a Medium. Against this background, my analysis suggests that in transitive constructions with Emission Verbs Voice assigns to its specifier the thematic role of a ‘Stimulus’ which is characterized in terms of an entailment from the dispositional property residing in the emitter argument as in (42).

- (42) stimulus(*p*)(*x*) \rightsquigarrow *x* is a stimulus in the presence of which a dispositional property *p* (the disposition to *V* when *C*) residing in *x* manifests itself.

According to this line of thought, and because Emission Verbs denote an event when they are intransitively used, we may assume that in intransitive usages of Emission Verbs ‘Stimulus Voice’ is defective in that it does not project a specifier¹¹ but only has the function of asserting that the stimulus conditions for the

¹¹An independent argument for a defective Voice head that does not project a specifier and a consequent separation of the semantics of Voice from its morphological exponence has been brought up in Alexiadou et al. (2015) in the context of the analysis of Greek anticausatives. The link between the analysis of Emission Verbs proposed here and Greek anticausatives may not be an

disposition of the Medium obtain and consequently, that the implication scheme (34) characterizing the manifestation event is redeemed. Accordingly, Stimulus Voice is always present in Emission Verbs because Emission Verbs are semantically transitive even if they are used in a syntactically intransitive construction¹². Concluding, in this subsection I argued that Emission Verbs, contrary to the analyses of Reinhart and RHL are semantically transitive. I explained the observation of McKoon and MacFarland (2000) that many Emission Verbs alternate with a transitive construction by arguing that the external argument, i.e. the grammatical subject of the transitive construction designates the stimulus conditions of a dispositional property residing in the Medium argument of the Emission Verb, which I analyzed as an internal argument. Before I elaborate on such more general aspects of the proposed dispositional analysis of Emission Verbs in the next section, I conclude the discussion of the lexical semantics of Emission Verbs with an assessment of the open question how Emission Verbs relate to the principle of manner-result complementarity.

4.5 Manifestation, manner and result

The goal of this subsection is to make more precise the semantic properties of manifestation events by contrasting the concept of a disposition's manifestation with the established concepts of manner and result. In section 2.2 I purported that Emission Verbs escape manner-result complementarity. Verbs that contradict manner-result complementarity have been discussed earlier, and thus a comparison of Emission Verbs with these earlier examples may be telling. For example, Beavers and Koontz-Garboden (2012) argue that what they call 'manner of killing' verbs as in (43) encode both manner and result.

accident after all, as Greek is a language which grammatically encodes a Medium Voice that can be used among others to express anticausative meanings, see e.g. Kaufmann (2004) for detailed discussion.

¹²One might speculate at this point whether the semantic transitivity of Emission Verbs is responsible for the selection of *haben* as an auxiliary in perfect formation, as transitive verbs in German generally select *haben*. Furthermore, I argued that Medium arguments are internal arguments (just like the arguments of unaccusatives), and thus one might conjecture whether this prevents impersonal passive formation. Accounting for the syntactic properties of Emission Verbs, however, is likely to require a more fine-grained analysis of the verbal phrase than I have been assuming here, see in particular Alexiadou (2014) for a proposal in this respect.

- (43) crucify, drown, hang, guillotine, electrocute
(Beavers and Koontz-Garboden, 2012, (7))

Beavers and Koontz-Garboden argue that a verb like *guillotine* encodes both a result of the event described (i.e. being dead) and the manner in which this result was achieved (i.e. by guillotining). Like I did for Emission Verbs, Beavers and Koontz-Garboden propose that manner of killing verbs (and also certain verbs of ballistic motion and cooking verbs) belong to a third semantic class of verbs besides pure manner and result verbs. Their analysis of the third class of ‘manner+result’ verbs, however, is still committed to the idea that the concepts of manner and result are sufficient to analyze the lexical semantics of verbs as in (43). The analysis I developed of Emission Verbs as being a third class of verbs besides unergatives (prototypical manner verbs) and unaccusatives (prototypical result verbs) is more difficult to reconcile with the dichotomy of manner and result, because manifestation does not correspond to either manner or result nor to a combination of both (like a certain manner event that induces a certain result state). I argued that Emission Verbs describe events that are the manifestation of a disposition. Thus, on the one hand, in a manner of speaking a manifestation event can be considered to be the ‘result’ of the Medium argument’s disposition being activated by the presence of appropriate stimulus conditions. On the other, one might describe the manifestation event as a ‘manner’ of producing that effect which counts as the manifestation of the disposition in question. That is, manifestation events could be perceived of as events in which result (the manifestation of the activated disposition) temporally coincides with and is conceptually indistinguishable from manner (unlike e.g. *to guillotine* where the result follows the manner and is conceptually clearly distinct). In other words, the production of that effect which counts as the manifestation of the disposition in question is both the result and the manner of the disposition’s manifestation. Consequently, characterizing Emission Verbs as pure manner descriptions falls short of acknowledging that the event described by an Emission Verb is the result of the manifestation of a disposition. But Emission Verbs are also not pure result verbs because the result is in fact an event. One underlying reason for the exceptional semantic behavior of Emission Verbs may be that in the events described by Emission Verbs, the order

of causation is inverted. In result verbs, an event causes a certain result, where the result usually corresponds to a property of the argument that is affected by the event (see e.g. Beavers (2013)). In Emission Verbs, a property residing in an argument is causally responsible (when activated by a stimulus) for the production of an event. That is, as long as the disposition of the Medium is not realized, Emission Verbs resemble unaccusative result verbs in that the Medium is an internal argument of the verb that has a certain property. But when the disposition is realized, Emission Verbs resemble transitive constructions in that the verb describes an event that came about through the interaction of the Medium disposition and its stimulus. If the unrealized disposition of the Medium argument corresponds to a description of a result, and Emission Verbs are semantically transitive, then my analysis can be understood to be in line with the constraint on the formation of *ung*-nominalizations formulated in Roßdeutscher and Kamp (2010). More generally, if what is nominalized in the case of German and English Emission Verbs is an unaccusative-like verbal phrase that designates a property (the unrealized disposition) of an internal argument, my analysis is also compatible with the more general unaccusative requirement discussed in section 2.1.

5 Outlook: dispositions and transitivity

If the analysis of Emission Verbs I proposed is on the right track, then dispositional properties and their manifestations are an integral constituent of the metaphysics of natural language in the sense of Bach (1986). Moreover, I believe that when taking into account that there may be more to causality than just those cause-effect relations standardly conceptualized in terms of the distinction between external and internal causation (as in the work of LRH) or [+/- cause change] roles (as in Reinhart's work), then more phenomena of the type exemplified by Emission Verbs will become visible to us. In the remainder of the present paper I would thus like to outline in broad strokes linguistic phenomena that show the characteristic properties of the involvement of dispositionality as discussed in the present paper and thus indicate directions for future research. However, I want to make clear right in advance that given the enormous amount of literature that has been published on each of the two research problems I touch upon in the following,

my presentation is necessarily simplified and cannot do justice to the full complexity of the matter. Instead, what I say in the following is to be understood as a collection of observations, remarks and suggestions rather than a full-fledged analysis.

5.1 The causative alternation

Recall that from the viewpoint of the traditional Agent/Patient dichotomy, the bearer of a disposition seems to conflate Agent and Patient and, as I argued, in fact escapes an analysis in those traditional terms. Thus, a simple heuristic for the identification of the involvement of dispositions in linguistic constructions is when the single argument of a construction is claimed to conflate Agent and Patient. One of the most popular phenomenon for which such a conflation of Agent and Patient has been prominently proposed in the literature is the causative alternation. To make a start, consider (44), yet another example from McKoon and MacFarland (2000) where an Emission Verb alternates with a transitive construction.

- (44) a. The local florist germinated the seeds.
b. The seeds germinated.
(McKoon and MacFarland, 2000, p. 856)

The example in (44) is insofar interesting, as the grammatical subject of the transitive construction is not a natural force but a human, i.e. a prototypical Agent. Given what I said about the stimulus conditions for the dispositions of Medium arguments, this raises the question for how the grammatical subject of (44-a) relates to the Medium disposition. Obviously, the mere presence of a florist is not sufficient to activate the disposition of the seeds, but “the most important external factors include right temperature, water, oxygen or air and sometimes light or darkness.”¹³. Instead, what (44) describes is an event in which the florist does something that causes the stimulus conditions for the dispositions of the seeds to obtain (i.e. to germinate when temperature, water and so on are right). (44) is telling because it parallels standard examples of the causative alternation, which I

¹³<https://en.wikipedia.org/wiki/Germination> last accessed March 14, 2018

repeat for *to break* in (45).

- (45) a. Peter broke the vase.
b. The vase broke.

Given that I want to highlight potential applications of the dispositional analysis of event structure I argued for, consider what RHL say about the verb *to break* in connection with (45): “Something breaks because of the existence of an external cause; something does not break solely because of its own properties (although it is true that it must have certain properties in order for it to be breakable) ... Some externally caused verbs (such as *break* can be used intransitively without the expression of an external cause, but, even when no cause is specified, our knowledge of the world tells us that the eventuality these verbs describe could not have happened without an external cause)”(Levin and Rappaport Hovav, 1995, p. 92f.). What is in striking parallel to the case of Emission Verbs is the way in which the relation between the absence of an external cause in (45-b) and the event described in (45-b) is “shrouded in theoretical mystery” (as a reviewer put it) when external and internal causation are assumed to be mutually distinct. But the mystery resolves immediately when, as for Emission Verbs we assume that what (45-b) describes is the manifestation of the disposition of the vase (to break when struck) in the presence of appropriate stimulus conditions. In fact, *breakable* is a dispositional property. And, as for (44), a stimulus for *breakable* (a plausible external cause in the sense of RHL) is not the presence of a person but what a person does to bring about the stimulus, e.g. a strike of the vase as in (46).

- (46) A strike (by Peter) broke the vase.

The second interesting observation about the causative alternation is that in many Indo-European languages, the intransitive construction of the causative alternation is marked with a reflexive pronoun (a ‘Medium’ marker in the terminology of Kaufmann (2004)), see e.g. the causative alternation in (47).

- (47) a. Peter öffnete die Tür.
Peter open the door.
‘Peter opened the door.’

- b. Die Tür öffnete sich.
 the door open REFL
 ‘The door opened.’

The function of the reflexive pronoun in (47) has been the subject of heated debate (see e.g. Alexiadou et al. (2004) for an overview). For example, Chierchia (2004) argues that (47-b) is derived from (47-a) by a process of reflexivization (associated with the reflexive pronoun) which identifies the grammatical subject and the grammatical object of the transitive construction. Thus, (47-b) is semantically transitive but syntactically intransitive. The resulting meaning of (47-b) in Chierchia’s analysis can be paraphrased as “a stative property of the theme causes the theme to undergo a change of state”, and consequently the door is both an Agent and a Patient. On the contrary, Schäfer (2008) argues that (47-b) is semantically intransitive but syntactically transitive and that the reflexive pronoun realizes a semantically empty ‘expletive’ specifier of a Voice projection.

From what has been said about how and why Emission Verbs escape an analysis in terms of the traditional concept of (external and internal) causation, it appears that the analysis of the anticausative constructions (45-b)/(47-b) is not so much a question of the derivational relation between the anticausative and the causative construction but rather pertains to the fact that the traditional concept of (external and internal) causation is difficult to apply to the analysis of the anticausative construction *per se*. The alternative plan for the analysis of anticausatives that the discussion of Emission Verbs in the present paper suggests is that the anticausative construction is similar to the intransitive use of an Emission Verb, the only difference being that for anticausatives the manifestation event of the disposition residing in the internal argument is described by a verb that participates in the anticausative alternation. If anticausatives are semantically transitive (as I proposed to be the case for Emission Verbs), then the single argument of the anticausatives (45-b)/(47-b) is a Medium, i.e. a bearer of a disposition and (45-b)/(47-b) describe the manifestation of the Medium disposition when appropriate stimulus conditions obtain. The dispositional property of the Medium would then correspond to the causally efficacious property in Chierchia’s analysis. Given that dispositions are stative properties and prototypically conflate the distinction between Agent and Patient, such an analysis would explain why in

Chierchia’s analysis it is plausible that the door in (47-b) is both the Agent and the Patient and why the causation in (47-b) is stative. But an analysis of anticausatives as describing the manifestation of a disposition residing in the internal argument of the verb along the lines I proposed for Emission Verbs would also be in congruence with the analysis of reflexively marked anticausatives of Schäfer, if the expletive Voice specifier realized by the reflexive pronoun corresponds to the specifier of what I called ‘Stimulus Voice’ earlier. The semantic function of the reflexive marker of the anticausative in (47-b) would then be to assert that the stimulus conditions for the Medium disposition obtain. The transitive causative construction would be derived in the same way as I proposed for the transitive variant of Emission Verbs: the stimulus is asserted to obtain by that description which is in the specifier of Voice, either ‘ambient conditions’ or what an Agent does in order to bring about those conditions under which the Medium disposition manifests itself. Under my analysis, unmarked anticausatives like (45-b) would involve a non-projecting Stimulus Voice the only function of which is to assert that those conditions obtain in the presence of which the disposition of the internal argument manifests itself¹⁴. Such a dispositional analysis of (unmarked) anticausatives would receive further support from an independent observation about the correlation between participation in the causative alternation and Medium dispositions: “[o]ne aspect of dispositional predicates that distinguishes them among ϕ -able predicates is that they are associated with verbs that give rise to a causative alternation” (Maier, 2016, p. 453). As a telling illustration of what I have in mind here, consider the templatic structure of a causative verb as in (48).

(48) [[x DO] CAUSE [BECOME y ⟨STATE⟩]]

What my proposal amounts to is a reinterpretation of the relation between the DO, the CAUSE and the BECOME predicate in terms of dispositions and their manifestations. Given that a dispositional property *p* resides in *y*, what agents or ambient conditions *x* DO in a templatic structure such as (48) is to bring about the stimulus

¹⁴As mentioned in footnote 11, such a non-projecting Voice has been invoked by Alexiadou et al. (2015) in the analysis of Greek anticausatives. I leave a further exploration of the cross-connections between the Greek Medium Voice and the proposed dispositional analysis of anticausatives to future research.

conditions C for p , and this in turn is CAUSALLY EFFICACIOUS for the disposition p to BECOME manifested and produce that resulting effect which the causative verb describes. I leave a further exploration of such an analysis to future research.

5.2 The middle construction

Another transitivity alternation that has proved to be notoriously unanalyzable in terms of the traditional Agent/Patient distinction and under the assumption that VPs always denote events is the middle construction as in the German example (49).

- (49) Dieses Buch liest sich leicht.
This book read REFL easy
'This book reads easily.'

As for anticausatives, we find two opposed strategies to analyze (49). Based on syntactic evidence from e.g. auxiliary selection and impersonal passives, Ackema and Schoorlemmer (1994) argue that middles are unergative, i.e. that the grammatical subject of the middle construction corresponds to the grammatical subject of a transitive verb. As only grammatical objects (i.e. Patients) but not grammatical subjects of transitive verbs (i.e. Agents) partake in the middle construction, the resulting analysis of middles is quite similar to the analysis of Emission Verbs in Reinhart's analysis: middle constructions are 'theme unergatives', syntactically unergative verbs that are semantically indistinguishable from unaccusative verbs (see also Labelle (2008)). But Reinhart herself does not consider middle constructions as 'theme unergatives' but as unaccusative verbs in which the single argument of a middle construction corresponds to the grammatical object of a transitive verb. Like many anticausatives, middles in German are marked with a reflexive pronoun. In unaccusative analyses, the reflexive pronoun has been argued to mark the absence of an external argument (Schäfer, 2008), in unergative analyses the reflexive pronoun has been proposed to mark the reduction of the external argument (Lekakou, 2005). The core property of middle constructions immediately suggests a dispositional analysis along the lines I have proposed for Emission Verbs: middle constructions do not describe actual events but rather characterize possible events (see e.g. Lekakou (2005) for discussion). More pre-

cisely, the middle construction characterizes an event which would take place if appropriate external circumstances obtained (in (49): if someone read the book). To make more precise the dispositional nature of the middle construction, and to highlight that the single argument of the middle construction is a disposition bearer, one may rephrase the meaning of (49) as in (50).

- (50) Dieses Buch ist leicht lesbar.
'This book is easily readable.'

Oltra-Massuet (2013) (see also Flury (1964) for German) analyze dispositional *-blel-bar* adjectives as being derived by a process akin to passivization from an underlying transitive base verb. If passivization is a process that demotes the external argument, then the analysis of Emission Verbs I proposed may provide an explanation for why the middle construction does not denote an event. In my proposal, stimulus conditions for a disposition have to be asserted in order to arrive at an event denotation. I identified the assertion of stimulus conditions with that linguistic locus that is commonly associated with the introduction of the external argument. Taken together, the suggestion I would like to put forward with respect to the analysis of middles is that the non-event-denotation of middles comes about when the stimulus conditions of a disposition are passivized. For Emission Verbs I argued that stimulus conditions are asserted to be causally efficacious, i.e. active. In contrast to this 'active' stimulus Voice, in middle constructions the stimulus conditions (represented by the reflexive pronoun in German) are asserted to be 'non-active', i.e. passive, and thus not causally efficacious. Consequently, in middle constructions the disposition residing in the grammatical subject is not asserted to have manifested itself and the middle construction denotes the unrealized disposition of the grammatical subject. Again, I leave a further exploration of this line of thought to future research.

6 Conclusion

I developed an analysis of Emission Verbs that attempts to do justice to their distinct syntactic and semantic behavior, a behavior that appears contradictory when

analyzed in terms of the traditional Agent/Patient dichotomy and frameworks of event structure based on actual causation. I introduced a thematic role called Medium which is not understood with respect to causal properties of the event described but with respect to causal properties of the Medium argument that manifest themselves when appropriate external circumstances obtain. According to my account of Emission Verbs, they are a third distinct class of (alternating) verbs besides unergatives and unaccusatives. Thus, the mixed results of syntactic unaccusativity diagnostics systematically single out Manifestation Verbs from the class of intransitives: in German, Emission Verbs 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. Manifestation 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 Emission Verbs neither syntactically nor semantically pattern with the two classes of unaccusative and unergative verbs predicted by Chierchia’s approach.

The larger question looming in the background of my proposal, and which I did not dare to address within the limitations of the present paper is whether

conceptual dichotomies like external/internal causation or Agent/Patient and their relations can and should be reduced to dispositions and their manifestation. I refrained from approaching this question because it suggests a reversal of the established direction of explanation in lexical semantics. A dispositional framework for event structure has it that the ‘deep’ structure of semantic relations alluded to in the introduction of the present paper is not encoded in the verb but rather in its arguments and that the meaning of the verb is characterized by the entailments of its arguments (rather than the other way round). In a dispositional analysis, the Agent/Causer role would correspond to the bearer of an active power, ability or capability (concepts which have been analyzed as special types of disposition, see Maier (2014)) and the Patient to the bearer of a passive disposition that is best described by dispositional adjectives like *readable* or *fragile* (see e.g. Cohen (2016) for a more detailed discussion). In turn, the study of event structure would then amount to differentiating the ways in which we can linguistically describe what happens “[w]hen the agent and the patient meet in the way appropriate to the disposition in question” (Aristoteles, *Metaphysics IX 5*). Originally intended as a case study on a narrowly circumscribed class of intransitive verbs, the analysis of these verbs has thus taken me to questions that reach far beyond what should and can be addressed in a simple research paper like the present one. But I hope that my efforts to make more precise the vexing properties of Emission Verbs at least encourage further thinking about the suggestions and observations made in this paper.

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