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‘The Gradeability of Causative Events’: A Combined Corpus-based and Dictionary-based Study of Middle English *-isen* Simplex Copies

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Abstract

Causativity is one of the most extensively studied operations in linguistics. No matter whether on a morphological, phonological, semantic, or syntactic level, there seems to be nothing that has not already been explored about this notion (cf. Beavers & Koontz-Garboden, 2020; Givón, 1975; Kemmer & Verhagen, 1994; Levin & Rappaport Hovav, 1995; Martin & Schäfer, 2014). The current study demonstrates that further insights into causativity and the semantics of English causative verbs can be gained by traveling back in time into the morphological history of Middle English. Causativity and the causativizing properties of verbal affixes are not comprehensively explored concerning previous stages of English (Dalton-Puffer, 1996; van Gelderen, 2018).

This study investigates Middle English *-isen* simplex copies, which came to English through the language contact situation with Anglo-Norman (Dalton-Puffer, 1996, p. 201). For this purpose, a combined corpus-based and dictionary-based investigation is carried out using three Middle English corpora. The concept of *causativity* is broken down into its component parts to investigate causative *-isen* simplex copies with the help of a classification schema that manifests three parameters of causativity. As a result of this investigation, the *-isen* simplex copies are classified into seven causative subclasses.

In addition, an event semantic analysis based on Piñón (2001a, 2001b) and Pizzolante (2017) allows for identifying fine-grained differences between different types of causative events. In this regard, it is demonstrated that causative events denote not only “varying degrees of causativity” but manifest different degrees of

complexity on an event semantic level. This study does not only provide further insights into the extensively explored notion of causativity but must, at the same time, be considered as one of the long-awaited stories about the morphological history of English.

Keywords: causativity; event semantics; derivational morphology; argument structure; contact-induced language change, Middle English

Contents

1 Introduction and Motivation

The human understanding of events is based on the notion of causation. Every event consists of a chain of circumstances (Smith, 1997, p. 21). The American philosopher Lewis (1973) once explained:

> We think of a cause as something that makes a difference, and the difference it makes must be a difference from what would have happened without it. Had it been absent, its effect [...] would have been absent as well (p. 557).

Lewis regards causation as a metaphysical property that indicates a counterfactual dependence between events. Each event is metaphysically interconnected with other events due to causal chains that necessitate one another (Lewis, 1973, p. 561).

Causation is a scientific notion that is not only of significant interest for philosophical considerations but is also subject to linguistic analysis. In most general terms, causation is a relation between two events: a causing event and a caused event. Considering the sentence (1) *The chemist pulverized the substance.* The event expressed in (1) consists of an activity event and a change-of-state event, which brings about the effecting of a result (Beavers & Koontz-Garboden, 2012, p. 332). The substance is *pulverized* due to the activity performed by the chemist. A causative verb such as *pulverize* has the meaning 'make x' or 'cause to become x' (Lieber, 2004, p. 77). Most significantly, the verb can also be used intransitively in a sentence like (2) *The substance pulverized.* In (2), the event is perceived as occurring spontaneously since no external Causer is syntactically expressed (Haspelmath, 1993, p. 92). The difference between the transitive and intransitive use of lexical causative verbs such as *pulverize* is subsumed under the causative/inchoative alternation (Levin, 1993, p. 28).

The fact that *pulverize* occurs in transitive and intransitive argument structure patterns makes this verb exceptional since only a restricted number of verbs participate in this alternation (Levin, 1993, pp. 27–30). Moreover, the verb *pulverize* is morphologically special since it is a verbal simplex copied[1] from Old French in medieval England (Marchand, 1969, p. 318). From 1066 to approximately 1500, England had extensive contact with Anglo-French (Percillier, 2019, p. 85). Not only was a vast amount of vocabulary copied into English due to the language contact situation with Anglo-French, but this contact situation also had an irreversible impact on the derivational system of English. The verbal derivational affixes *en-*, *-ize*, *-(i)fy*, and *-ate* came to English through French (van Gelderen, 2018, p. 95). Since these four derivational affixes are typically defined as productive causative affixes in Modern English, the question arises whether they had similar causativizing properties regarding previous stages of English (Plag, 1999, p. 29; 2003, p. 93).

Lang (2022) shows that further insights into causativity and the semantics of causative verbs can be gained by traveling back in time into the morphological history of Middle English with

[1]The term copying will be used in this study instead of the traditional word borrowing to account for the transmission of linguistic elements from one language to another. The term copying is regarded as less biased than the word borrowing. For a discussion, see Johanson (2002).

a corpus-based study of the Middle English derivational suffix *-fien* (PDE *-ify*). Lang (2022) detects that all *-fien* verbs are simplex copies and denote multiple causative senses (p. 41). More specifically, she differentiates in terms of a qualitative investigation of *-fien* simplex copies between two classes of causative verbs and argues that causativity is "a matter of degree" (p. 43).

In light of this, it is empirically relevant to explore whether fine-grained differences between causative events denoted by causative verbs such as *-fien* and *-isen* (PDE *-ize*) verbs exist. Such an investigation sets the foundation for follow-up studies that will explore the emerging productivity of these causativizing suffixes and the diachronic development of causative verbal derivatives by accounting for fine-grained differences between causative subsenses and the displayed causative events.

Considering everything said so far, the primary question is whether it is possible to establish fine-grained differences between causative events and whether causativity is actually a gradual rather than an absolute phenomenon.

The current study seeks to answer these questions by investigating Middle English verbs built with the suffix *-isen*, which is the Middle English counterpart to Present-Day English *-ize* ('-ize, suf.', OED, Proffitt, 2015).[2] Verbs with the suffix *-isen* came as simplexes into English in medieval times (Marchand, 1969, p. 318).[3]

The subsequent section elaborates on the notion of argument structure and provides the semantic role list taken for this study. Section 3 defines the main characteristics of causative verbs by introducing three parameters of causativity. In section 4, the theoretical framework taken for this study will be specified, namely, an event semantic analysis based on Piñón (2001a, 2001b) and Pizzolante (2017). Section 5 presents the method of this study: a combined qualitative corpus-based and dictionary-based investigation. In addition, this section outlines the more specific research questions and proposes the hypotheses. Section 6 is concerned with the qualitative investigation of *-isen* verbs. In the final section, the main findings of the investigation are briefly summarized, and an outlook is presented.

2 Argument Structure and Semantic Roles

One of the most widely adopted notions for describing the semantic aspects of argument realization of lexical items is the notion of semantic roles. According to Levin and Rappaport Hovav (2005), "[e]ach semantic role defines a natural class of arguments, with members of this natural class usually having a common semantic relation to their verbs and shared options for their morphosyntactic expression" (p. 36). From this definition it can be deduced that semantic roles are quite helpful for investigating argument structure patterns denoted by verbs since they allow to "bring out similarities and differences in verb meaning" (Levin & Rappa-

[2] It must be taken into account that the semantic properties of *-fien* and *-isen* verbs will be compared within the scope of a follow-up study.

[3] Concerning the current study, all verbs with the suffix *-isen* are verbal simplexes copied from Old French and have their roots in Latin or Greek. For terminological simplicity, the term *-isen* verbs will be used instead of *-isen* simplex copies during the subsequent analysis.

Table 1: Semantic roles of the Causee

Semantic Roles	Definition	Prototypical Causee
Patient	Prototypically an animate entity that is strongly affected by the event and might undergo a change in the physical shape of appearance (Levin & Rappaport Hovav, 1995, p. 93).	+
Experiencer	A sentient being that undergoes either a cognitive, mental, emotional, or sensory experience (Van Valin & LaPolla, 1997, p. 85).	↓
Recipient	Animate entity that is capable of possession and becomes the possessor argument by means of the transfer of a Theme (Van Valin, 2005, p. 58).	-

port Hovav, 2005, p. 36). The semantic role list taken for this study is not adopted from one work but instead compiled from multiple sources discussed below to account for fine-grained differences in the degree of causativity.

Two possible semantic roles for the Cause argument are relevant to the current investigation: The Causer is either an Agent or a natural force. The semantic role Agent refers to an entity that is acting volitionally and intentionally and is in full control of its actions (Van Valin, 2005, p. 56). A natural force is a non-agentive entity that *causes* an event and that is capable of independent motion and action (Van Valin & Wilkins, 1999, p. 318). Significantly, an Agent is regarded as a more prototypical Causer than a natural force (Levin & Rappaport Hovav, 1994, p. 50). The reason for this will be explained in the subsequent section (see below).

Table 1 accounts for possible semantic realizations of the Causee relevant to the semantic investigation. The semantic roles of the Causee argument are hierarchically arranged in this table. The reason for indicating the prototypicality of the semantic realization of the Causee is interrelated with the findings of Lang's (2022) study. This study detected that the entities undergoing a causative event differ depending on the properties of the verbs and whether the event is of an abstract nature or not (Lang, 2022, p. 30). The most prototypical Causee argument is a Patient, and the least prototypical Causee is a Recipient (Lang, 2022, p. 22; Levin & Rappaport Hovav, 1995, p. 83).

Importantly, it is essential to consider that the semantic role Experiencer is typically associated *with change-of-psych-state events* denoted by *psych-verbs* (Plag et al., 2018, p. 469). Examples of *psych-verbs* are *amuse*, *confuse,* or *hypnotize*, which semantically indicate that an entity experiences some sort of change in their emotion or mental state (Levin, 1993, pp. 189–191). Concerning the current study, some *-isen* verbs denote an abstract event, which indicates that a sentient being undergoes a change in mental status. Such verbs must not be equated with *psych-verbs* that represent a specific class of verbs that typically expresses a *change-of-psych-state* event (Hartshorne et al., 2016, p. 281; Varchetta, 2010, p. 114).

Nonetheless, the semantic role Experiencer is the most appropriate role to account for the semantic properties of change in mental status events denoted by some *-isen* verbs. Differenti-

ating between these roles allows for accounting for fine-grained differences between causative events on a semantic level. This aspect will further be explained in the following section that elaborates on the main characteristics of prototypical causative events.

3 The Parameters of Causativity

Causativity is a concept that incorporates, on a syntactic, semantic, and aspectual level, multiple subcomponents (cf. Alexiadou et al., 2006; Alsina, 1992; Levin & Rappaport Hovav, 1994; Martin & Schäfer, 2014). Because of this, it is relevant to develop a clear categorization schema that allows for classifying causative events for the semantic analysis. Hopper and Thompson (1980) explore *transitivity* in grammar and discourse. For this purpose, they develop a set of components depicting the main features of transitive events. According to Hopper and Thompson (1980), these components can be regarded as "parameters of Transitivity, each of which suggests a scale according to which clauses can be ranked" (p. 251). The idea of developing such a set of parameters can be transferred to account for the "degree of causativity". Causativity incorporates multiple components that require further specification in the same way as transitivity.

Notably, it is possible to make precise comparisons between different types of causative events by working with a set of parameters. In this regard, it must be considered that the notion of *parameter* must not be equated with the "principles and parameters" account within generative linguistics (Chomsky, 1981). The term *parameter* is used to establish measurable values to account for differences between causative events. More concretely, the developed parameters manifest differences in the semantic properties of causative events and incorporate the option of a low, middle, and high value. They allow to explore the semantic and aspectual differences between causative events.

During the qualitative analysis, causative subclasses will be established that denote a specific value for each developed parameter. Importantly, the set of parameters was developed by considering the main characteristics of causative events most frequently mentioned in literature on causativity. The compiled main characteristics were transferred to the following three parameters: *volitionality*, *affectedness*, and *transformation.*

Section 4 elaborates on these parameters, which allow to carve out differences between lexical causative verbs in direct causative events. Beforehand, it is essential to briefly comment on why these parameters do only allow carving out differences between direct causative events.

Lexical causative verbs such as *pulverize* that participate in the causative/inchoative alternation are defined as labile verbs (Levin, 1993, p. 27). Such verbs do not change their morphological form when used transitively or intransitively (Kulikov, 2001, p. 887). On a syntactic level, verbs like *pulverize* are typically used in a single-clause sentence, such as (1) *The chemist pulverized the substance.* Sentence (1) depicts a temporally adjacent eventuality (Martin, 2018, p. 111). The same applies to causative verbs such as *bake* or *build* that do not participate in the causative/inchoative alternation (Levin & Rappaport Hovav, 1995, p. 102). The sentence (3) *Mary baked the cake* denotes direct causation. However, a bi-clausal construction such as (4) *Mary caused the ice cream to melt on Sunday by heating it on Saturday* is said to denote

indirect causation (Martin, 2018, p. 107).

The main difference between these examples is based on the encoded temporal attributes of the causative events. Direct causative events denote temporal continuity in contrast to indirect causative events (Wolff, 2003, p. 3). The distinction between these two types of causation is commonly made by researchers that explore the underlying event structure of causative events (cf. Martin, 2018; Neeleman & van de Koot, 2012; Spohn, 1990; Wolff, 2003). However, accounting for this difference is irrelevant to the current investigation since no causative verb occurs in a bi-clausal construction as depicted in (4). Consequently, directness will not be considered a parameter of causativity for this investigation but would be a relevant distinguishing criterion when exploring causative events that are syntactically more varied.

A. Volitionality: In the literature on causativity, it has consistently been noted that prototypical transitive events denote an Agent carrying out an action that affects another entity, most prototypically realized as a Patient, whereas less prototypical transitive events involve non-agentive Cause arguments (Cruse, 1973, p. 21; DeLancey, 1984, p. 82; Levin & Rappaport Hovav, 1995, p. 91; Wright, 2002, p. 341). Being capable of acting volitionally is a primary characteristic of Agents (Naess, 2007, p. 41). On that account, the most prototypical Cause argument is an Agent, an entity acting volitionally and employing its own energy in carrying out a specific action (DeLancey, 1984, p. 84).

Levin and Rappaport Hovav (1995) explore the argument structure properties of externally caused verbs. They explain that "transitive causative verbs that detransitivize are those in which the eventuality can come about spontaneously without the volitional intervention of an agent" (p. 102). Because of this, verbs that detransitivize, and thus participate in the causative/inchoative alternation are less restricted in the semantic realization of the subject than verbs that resist detransitivitzation and do not participate in this alternation (Levin & Rappaport Hovav, 1995, p. 103). For example, some verbs of killing such as *assassinate* or *murder* never detransitivize because they require an Agent that is acting volitionally and intentionally (Levin, 1993, p. 231). A sentence like (5) *The terrorist murdered the woman* is grammatical, but a sentence like (6) **The explosion murdered the woman* is ungrammatical because the verb *murder* is semantically restricted regarding the realization of the Cause argument (Levin & Rappaport Hovav, 1995, p. 102). According to the OED, this verb semantically encodes that an animate being is slaughtered in a terrible manner or killed "wickedly, inhumanly, or barbarously" ('murder, v.', OED, Proffitt, 2015). An Agent can perform such an activity but not a natural force or circumstance (Levin & Rappaport Hovav, 1995, pp. 94–95).

Considering this restriction, *-isen* verbs that license only an Agent as Cause argument will be regarded as denoting a higher degree of causativity than verbs that are less restricted in terms of the realization of the Cause argument.

B. Affectedness: Most causative verbs display one specific property: they typically denote a *change-of-state* event (Rappaport Hovav & Levin, 1998, p. 116). If an event denotes a change of state, it will simultaneously indicate that an entity is affected by this event. Change of state verbs are commonly subdivided into two different classes: *internally* and *externally* caused change of state verbs (Levin & Rappaport Hovav, 1994, 1995; McKoon & MacFarland, 2000; Wright, 2002). On an underlying level, externally caused change of state verbs denote a

transitive event that can be paraphrased ((α) CAUSE (BECOME (x (STATE)))) whereas internally caused change of state verbs are intransitive events with the underlying meaning (BECOME (x (STATE))) (McKoon & MacFarland, 2000, p. 834).

Levin and Rappaport Hovav (1995) emphasize that "[a]ll verbs of change of state have in common the substructures consisting of the primitive BECOME" (p. 24). This characteristic is of significant relevance since the primitive BECOME is the main operator of a change-of-state event, typically indicating a resulting state (Beavers & Koontz-Garboden, 2012, p. 333; 2020, p. 10). On that account, change of state verbs are usually, at the same time, result verbs that denote scalar changes (Rappaport Hovav & Levin, 2010).

To give an example, a change of state verb such as *clear* lexically specifies in a sentence like (7) *The filter cleared the dirty water* a scale that indicates the transformation of a Causee, which is in example (7) the *water*. The points of intervals indicating the measurement value on the dimension of clearness can be identified. It can be perceived how the *water* is transformed from being *dirty* to being *cleared* due to the causative event (Rappaport Hovav & Levin, 2010, p. 7). However, identifying a scale of clearness is not possible for an abstract causative event such as (8) *The soul is clarified by the love of God* (Lang, 2022, p. 15). The *change-of-state* event in (8) is situated on an abstract level, and the same applies to the resultant state of the event. Accordingly, the affectedness of the *soul*, and thus, the points of measurement on the dimension of clearness, cannot be identified since the event is not visually observable (Rappaport Hovav & Levin, 2015, p. 601).

In consideration of this, it must be taken into account that affectedness is an abstract notion that is challenging to conceptualize. This applies not only to events indicating affectedness on an abstract level but also to the physical/material dimension. Von Heusinger and Kaiser (2007) remark that "affectedness itself seems to be a complex category that consists of subproperties such as the animacy of the object, the agency of the subject, the involvement of the object, and the aspect or aktionsart of the verb" (p. 92).

Despite the challenge of conceptualizing the notion of affectedness, research exploring the argument structure properties encoded by transitive events has shown that differentiating between degrees of affectedness is possible and empirically necessary. To give a concrete example, Beavers (2011) proposes an "affectedness hierarchy" to account for differences in the affectedness of the direct object (p. 359). His hierarchy is based on a lexical semantic and aspectual analysis of causative verbs and is modulated with the help of event-semantic representations. Beavers (2011) highlights the relevance of making fine-grained differences when analyzing causative events. One of the main criteria used for classifying types of affectedness is whether the change is an observable property and whether an entity is physically impinged (Beavers, 2011, p. 358).

Figurative or abstract types of affectedness are not taken into account in Beaver's (2011) study, but von Heusinger & Kaiser (2011, p. 597), Tsunoda (1985, p. 388), and Malchuvok (2005, p. 83) propose affectedness sales that account for abstract (i.e., non-perceptible) events involving emotion and sensation. These scales show that a high degree of affectedness does prototypically involve an animate entity undergoing a physical transformation or change in some observable property, such as *cleaning*, *breaking*, *damaging*, or *harming* someone or some-

thing. This goes hand in hand with the fact that such events generally denote a scalar change that specifies a scale with clearly definable values from a property domain like clearness or brokenness (Rappaport Hovav, 2014, p. 264). Events that involve sensation or emotion are defined as involving a lower degree of affectedness. One reason for their lower degree of affectedness is that they do not refer to observable events or encode scalar changes (von Heusinger & Kaiser, 2011, pp. 598–599).

Based on what has been explained so far, it can be stated that any kind of abstract causative event that involves the abstract affectedness of an animate or inanimate entity is generally less causative than causative events that involve the physical or material affectedness of an entity. This premise must be taken into consideration concerning the following investigation. The difference between physical/material and abstract events is one distinguishing criterion for establishing different parameter values for the proposed parameters of causativity presented at the end of this section.

Furthermore, Lang (2022) has shown that affectedness might only play a role in a figurative sense concerning one specific subtype of abstract causative events. Her qualitative investigation of *-fien* verbs has revealed that causative verbs can also denote an abstract meaning that indicates that an entity receives something on an abstract level, which is displayed by verbs such as *glorifien* (PDE glorify) (Lang, 2022, p. 22). In this regard, the entity that receives an abstract property such as *glory* is identified as a Recipient and not an Experiencer (Lang, 2022, p. 23). Affectedness could only be attributed to such an event on a figurative level, but still, the event is a causative event (Lang, 2022, p. 23). This is the reason why using the two distinct semantic roles of Experiencer and Recipient is of significant relevance to differentiate between abstract causative events with respect to the affectedness of the Causee.

C. Transformation: Causative events denote that an animate or inanimate entity is affected by an event (Rappaport Hovav & Levin, 1998, pp. 116–118). Most significantly, the animate or inanimate entity might either undergo a complete transformation that is irreversible, a partial transformation that is reversible, or a transformation on an abstract level (Lang, 2022, p. 29–30). The parameter of transformation accounts for these three types of transformation that an entity might undergo in a causative event.

For instance, the change-of-state event (9) *She caramelized the sugar* indicates the complete transformation of an inanimate entity that has the semantic role Patient (Levin & Rappaport Hovav, 1994, p. 52). The *sugar* is transformed due to the process of caramelization (Levin, 1993, p. 24). Abstract causative events might indicate a transformation on a mental level, such as in (10) *She pacified the crying baby* (Levin, 1993, p. 189). However, the transformation denoted by such events is situated on an abstract level. Due to the abstractness of the event, the resultant state can be regarded as less strongly causative than for physical/material causative events. The latter type of events might induce irreversible transformations, whereas transformations on an abstract or mental level can more easily be reversed. For instance, if someone is killed, the entity undergoes a change of state from being alive to being dead, and this change is irreversible (Levin & Rappaport Hovav, 1995, p. 50). However, if a baby cries and is pacified, the resultant state is reversible since the baby can cry again.

This aspect is crucial concerning differences between the degrees of causativity. If an event

denotes an irreversible transformation, this event will be considered to display a higher degree of causativity than an event that depicts a reversible transformation. If an event proceeds on an abstract level, the degree of causativity is regarded as the lowest (Lang, 2022, p. 30).

As mentioned previously, change of state verbs generally denote a resultant state. The property of conveying such a state is subsumed under the term *telicity*. As Smith (1997) explains, "telic events have a change of state which constitutes the outcome, or goal, of the event. When the goal is reached, a change of state occurs, and the event is complete" (p. 19). In contrast to telic events, atelic events do not refer to an endpoint but can instead be regarded as processes that might stop at any time (Smith, 1997, p. 20).

Every sentence expresses a particular situation type with an internal structure denoting specific temporal features. Concerning the classification of the *-isen* verbs, it is in a final step relevant to elaborate on the difference between the situation types of Accomplishments and Activities.

Accomplishments differ from Activities in the respect that they denote an outcome or a change of state and have the temporal features [Dynamic], [Telic], and [Durative] (Smith, 1997, p. 26). An example of an Accomplishment is the sentence (11) *The storm destroyed the building* (Levin & Rappaport Hovav, 1995, p. 50). The event of *destroying* something consists of successive stages that proceed to a final endpoint. Accordingly, such events denote a resultant state, which is the transformation of an entity. Levin and Rappaport Hovav (1995) explain that "[A]ccomplishments always describe causative changes of state" (p. 55). Most importantly, the resulting state is lexically specified by the verb.

Activities have the temporal features [Dynamic], [Atelic], and [Durative] (Smith, 1997, p. 23). Furthermore, activities do not have an endpoint or stop. Considering example (12), *Marry swims*. The notion of completion is irrelevant in (12) since no temporal endpoint is indicated. The difference between Activities and Accomplishments is essential in classifying events as denoting a causative or non-causative meaning.

Table 2 summarizes the three proposed parameters that will be used to account for the degrees of causativity denoted by the *-isen* verbs with their different subsenses in causative events.

The parameter of volitionality accounts for the semantic realization of the Cause argument and is regarded as a binary parameter; either the parameter value is high or low. The other parameters have the option of the in-between value "middle". The parameter of affectedness refers to the semantic realization of the Causee and differences in its affectedness. The parameter of transformation accounts for the aspectual properties of the event.

Concerning the parameter of transformation, it must be considered that causative events indicating either the physical/material or mental transformation of an entity have the parameter value "middle", whereas events referring to the transfer of an abstract property have the parameter value "low". The reason for differentiating between these two different types of abstract causative events with the parameter values of transformation will be explained during the analysis.

Table 2: "The Parameters of Causativity" for lexical causative verbs in direct causative events

Parameter	High	Middle	Low
A. Volitionality (Cause argument; semantic level)	The formal subject is an entity that is acting **volitionally** and **intentionally**. This entity is in full control of their actions.		**Non-agentive** entity that CAUSES an event, such as natural forces, instruments, or circumstances.
B. Affectedness (Causee argument; semantic level)	Change-of-state event denoting the **physical** affectedness of an animate entity; a **resultant state** is implied (i.e., occurrence of an effect). The event has the underlying meaning 'cause to V_o' or 'make V_o' (Kulikov, 2001, p. 886).	Change-of-state event denoting the **material** affectedness of an inanimate entity; a **resultant state** is implied (i.e., occurrence of an effect). The event has the underlying meaning 'cause to V_o' or 'make V_o'.	Affectedness refers to an abstract level. The event denotes on an **abstract level** the underlying meaning 'cause to V_o' or 'make V_o'. A **resultant state** is implied.
C. Transformation (Aspectual level)	**Complete** physical/material transformation of an animate or inanimate entity. The change is **irreversible**.	Only **partial** physical/ material transformation of an animate or inanimate entity, or a sentient being is **mentally** transformed. The change is **reversible**.	Transformation in an **abstract property.** The change is **reversible**.

4 Event Semantics

In the previous section, the term causativity has been specified, and the main characteristics of causative *events* have been discussed without having defined the term *event*. The notion of *event* is of major significance regarding the current study. Therefore, this section provides, in the first step, a general definition of this notion to introduce in the second step the event-based framework adopted for this study.

A very general definition of *event* is provided by Maienborn (2019). She explains that "events are *things* in the real world like objects; they can be counted, they can be anaphorically referred to, they can be located in space and time, and they can be ascribed further properties" (p. 53). From this it follows that events are perceptible and may have a spatiotemporal manifestation. Maienborn's (2019) definition of *event* can be situated in the context of Davidsonian event semantics. Davidson (1967) introduced the notion of *event* as an analytical tool for exploring the semantics of sentences (p. 90).

In the years to follow, Davidson's ideas were picked up by researchers such as Higginbotham (1985, 2000), Parsons (1994), and Kratzer (1995), who contributed with their frameworks to the development of the so-called *Neo-Davidsonian paradigm* (Maienborn, 2011, p. 809). Three main assumptions unify approaches situated in this paradigm. Firstly, the notion of event is generally understood in a broad sense and accounts for different types of eventualities, for instance, processes and states (Maienborn, 2011, p. 810). Davidson (1967) exclusively accounted for action verbs. Secondly, the *event argument* is not taken as an additional argument of a verbal predicate as originally proposed by Davidson (1967, pp. 86–87). Thirdly, Neo-Davidsonian approaches use thematic roles for linking events to their participants (Maienborn, 2011, p. 811).

A very influential Neo-Davidsonian account is proposed by Parsons (1994), who introduces an event semantic framework that incorporates thematic roles and accounts for a distinction between events and states (p. 68). Most importantly, Parsons (1994) is concerned with the event semantic analysis of sentences but does not account for verbs (p. 92). To illustrate this with a concrete example, Parsons (1994, p. 23) provides the following event semantic representation for the compound sentence (13) *Brutus stabbed Caesar and Laertes stabbed Hamlet*:

(14) (∃e)[Stabbing(e) & Subject(e, Brutus) & Object(e, Caesar)],
(∃e)[Stabbing(e) & Subject(e, Laertes) & Object(e, Hamlet)].

The formal representation in (14) specifies the event of stabbing, which is inherently transitive, requiring a Subject and an Object. *Brutus* and *Caesar*, as well as *Laertes* and *Hamlet*, are depicted as the participants of the event. However, the event semantic representation in (14) does neither make explicit the relationship between the verb and the participants involved in the event nor does it specify the resultant state of the event as lexically denoted by the event of stabbing (Levin, 1993, p. 231–231).

To investigate the properties of causative verbs, it is crucial to have a framework that allows for a fine-grained analysis of the underlying event structure and different argument structure patterns denoted by verbs. An approach that overcomes this "shortcoming" of Parsons' (1994) model is proposed by Piñón (2001a, 2001b).

Piñón (2001a, 2001b) investigates causative verbs participating in the causative/ inchoative alternation and either having an alternating verb stem or are derived by means of suffixation. More concretely, he develops a strategy to account for the event semantic representation of such alternating verbs. Even though Piñón is exclusively concerned with alternating verbs that can be used transitively and intransitively, his proposal can more generally be used to explore the different types of underlying event structures denoted by causative verbs, including those which do not alternate.

Piñón's (2001a) proposal is based on a type-theoretic language called *L*. This type-theoretic language comprises the following domains: a domain of *ordinary objects* (x, y, …), a domain of *events* (e, e', …) and a domain of *states* (s, s' …) (p. 351). In addition, Piñón (2001a) explains that "[t]he union of the domain of events and states constitutes the domain of *eventualities* (v, v', …) (p. 351).

Two further distinguishing properties of *L* concern the spatiotemporal realm. Piñón distinguishes on a temporal level between *complete temporal precedence* ($\prec$) and *immediate temporal precedence* ($\ll$). The former notion indicates a two-place relation between eventualities that is "irreflexive, asymmetric, and transitive" (Piñón, 2001a, p. 351). Put differently, *complete temporal precedence* indicates that an event occurs in a strict temporal order (Piñón, 2001a, p. 351). The second notion denotes that no third eventually can temporally come between an eventuality that immediately temporally precedes a second one.

The last relevant notion that must be specified with respect to his proposal is called *cause*. This notion indicates a two-place relation between events: "If an event *e* causes an event *e'*, then no part *e' '* of *e'* completely temporally precedes *e*" (Piñón, 2001a, p. 352). Essentially, the proposed condition permits *e* and *e'* to overlap temporally. This aspect is crucial concerning the definition of direct causation, as outlined in the previous section. An activity event that induces a second subevent (i.e., a change-of-state event) can temporally overlap with the second subevent (Piñón, 2001b, p. 290). For instance, Piñón (2001a, p. 352) schematizes the event semantic representation for an event like (15) *The student broke the pencil* in the following way:

(16) $\text{Change-of-State(e, x, s, P)} \stackrel{\text{def}}{=} \text{Theme(e, x)} \wedge \text{e} \ll \text{s} \wedge \text{P(s)} \wedge \text{Theme(s,x)} \wedge$
$\forall \text{e'}\ [\text{e'} \subset \text{e} \wedge \neg(\text{e'} \subset_{\text{fin}} \text{e}) \longrightarrow \exists \text{s'}[\text{e'} \ll \text{s'} \wedge \text{P(s')} \wedge \text{Theme(s', x)}]]$
(change of state)

(16) depicts a change of state event that specifies a four-place relation between events, objects, states, and types of states. More concretely, the formal representation defines that "an object *x* comes to be in a state *s* of type *P* by virtue of *e*" (Piñón, 2001a, p. 352). The variable *x* is the Theme of the event *e*, and *e* immediately precedes the state *s*. Furthermore, *s* is of type *P* and "no proper part *e*' of *e* that is not also a final proper part of *e* is immediately followed by a state *s*' of type *P* of which *x* is the theme" (Piñón, 2001a, p. 352). The event semantic representation in (16) accounts in contrast to the representation in (14) for the semantic as well as syntactic requirements of the verb. As a result, the underlying event structure in (16) is marked by a higher degree of complexity than in (14).

Concerning the temporal attributes of the event in (16), it must be considered that the activity event of breaking the pencil partially overlaps with the second subevent but does not completely overlap with it, which is indicated with the sign ≪. The activity event must start first; otherwise, the pencil cannot break and, thus, undergo a change of state as specified by the second subevent in (16).

Piñón's (2001a, 2001b) framework has been adopted by Pizzolante (2017) to investigate causative events denoted by polysemous French causative verbs such as *solidifier*, *caraméliser*, and *humidifier* (p. 26). Pizzolante's (2017) work is of major importance for the event semantic modulation of the causative verbs of the current study. She developed an automatic extraction method for classifying polysemous French causative verbs derived from the electronic verb database *Les verbes français* (Dubois & Dubois-Charlier, 1997). Within the scope of her analysis, Pizzolante (2017) came up with different causative subclasses and accounted for the differences between these classes on an event semantic level by using Piñón's framework (2001a, 2001b). To give a concrete example of a generalized event semantic representation developed by Pizzolante (2017, p. 74):

(17) $\lambda y \lambda x \lambda e[\exists e' [(\text{Performer}(e,x) \wedge \text{Cause}(e,e') \wedge \text{Causee}(e',y) \wedge \exists s[e' \ll s \wedge P_{\text{formal-i }+1}(s) \wedge \text{Causee}(s,y)]]]$

The event semantic representation in (17) accounts for verbs such as French *alcooliser* (PDE alcoholize) that denote a causative form change, defined as the "K-Form-Ändern" class (Pizzolante, 2017, p. 74). The example in (17) indicates that a Performer (e,x) carries out an activity (Cause(e,e′)) through which the Causee (e′,y) undergoes a change of state. The resultant state of the event is a change in the form of the Causee, defined by the index $P_{\text{formal-i+1}}(s)$. The major theoretical benefit of providing such a representation for causative events lies in the fact that it allows to abstract away from specific sentences that have been investigated on a semantic, syntactic, and aspectual level. Verbs that denote similar types of causative events with their subsenses can be subsumed under the same generalized event semantic representation with these subsenses. Therefore, templates as presented in (17) can be used to compare causative events in a unified manner.

Because of this, it is from a theoretical perspective useful to consider Pizzolante's (2017) proposed classes with their corresponding event semantic representations when analyzing the causative events displayed by the *-isen* verbs. However, only a restricted number of Pizzolante's (2017) causative classes are relevant to the current investigation. These classes are adjusted to account for the causative events displayed by the *-isen* verbs by using the terminology established in Piñon's (2001a, 2001b) framework.

It must be noted that Pizzolante (2017) and Piñón (2001a, 2001b) use the generalized semantic role Performer to subsume potential Cause arguments. In fact, the term *performer* semantically indicates that someone "carries out an action, function, piece of work" ('performer, n.', OED, Proffitt, 2015). Because of this, a Performer can also be regarded as the logical subject of an activity event and does not exclusively specify the Cause argument of a causative event. Therefore, the role Causer is considered more suitable in accounting in a generalized way for the logical subject of causative events and will be used consistently for the proposed event

semantic realizations.

5 Methodology

The previous sections laid the terminological and theoretical foundation for the qualitative analysis. In this section, the methodology for the empirical investigation will be introduced.

This study investigates Middle English *-isen* verbs by conducting a combined corpus-based and dictionary-based investigation. The corpus data used in the study comes from the following three Middle English corpora: *The Penn-Helsinki Parsed Corpus of Middle English 2* (Kroch & Taylor, 2000, henceforth PPCME2), *The Parsed Corpus of Middle English Poetry* (Zimmermann, 2015, henceforth PCMEP), and *The Parsed Linguistic Atlas of Early Middle English* (Truswell et al., 2018, henceforth PLAEME). *Toolbox Anglistik IV* provides a lemmatized version of each of the three corpora and is used to conduct the search query (Trips et al., n.d.). The three corpora cover a time span from 1150 to 1500 and subsume multiple subperiods. For methodological simplicity, the observed data will not be divided into individual periods since such a subdivision is not of major significance in consideration of the research questions raised in the first section.

To account for the *-isen* verbs, the following query is compiled for each of the three corpora: (V* idoms*@l=*isen@*|*@l=*ise@*|*@l=*izen@*|*@l=*ize@*|*@l=*issen@ *|*@l=*isse@*).

Table 3: *-isen* verbs extracted from the corpora

Verb Lemma	Number of Hits
chastisen	22
baptisen	118
rebaptisen	2
evangelisen	21
solempnisen	2
prophetisen	1
canonizen	5
In total	**171**

For the PPCME2, the output of this query is 1930 hits and 136 true positives. PLAEME provides 545 hits and 34 true positives, and the output of the PCMEP is 439 hits and 3 true positives. The number of true positives is significantly small. In total, only 7 *-isen* simplex types depicted in Table 3 are extracted from the corpora.[4]

The motivation for combining the corpus-based study with a dictionary-based approach lies in the finding that verbs with the suffix *-isen* occur only to a minimal extent in the corpora. Additional verbs are taken from the *Middle English Dictionary* (McSparran et al., 2001, henceforth MED). These are the following verbs listed under the MED entry of *-isen*: *pulverisen*, *cauterizen*, *fraunchisen*, *anientisen*, *intronizen*, *marchaundisen*, *recognisen*, and *auctorisen* ('ise(n, suf.',

[4]The false positives that occurred most frequently are the verbs *isen*, *arisen*, *reisen*, and *blissen*.

McSparran et al., 2001). All lemmas have been checked for whether they are verbal simplexes copied from Old French or, respectively, Latin by cross-checking them with the help of two dictionaries: the *Tobler-Lommatzsch* (Blumenthal & Stein, 2002) and the *Anglo-Norman Dictionary* (AND, 2022). The *-isen* verbs extracted from the corpora and the MED will be investigated qualitatively to draw valid conclusions about the different functions exhibited by *-isen*. Taking all types together, 15 *-isen* verbs will be investigated and classified.

After having laid the theoretical, terminological, and methodological foundation, it is necessary to restate the research questions and propose the corresponding hypotheses.

R1: In which argument structure patterns do *-isen* verbs occur?

H1: *-isen* verbs exhibit a "polysemous behavior" and occur in causative as well as non-causative argument structure patterns.

R2: Is causativity a gradual rather than an absolute phenomenon? What factors contribute to the gradeability of causative events?

H2: Causativity is a gradable phenomenon.

6 Empirical Investigation of *-isen*

Concerning the etymology of *-isen*, it must be considered that this suffix originates in Greek and is used to form transitive and intransitive verbs, even though transitive verbs occur more frequently (Marchand, 1969, p. 318). Examples of transitive and intransitive verbal derivatives found in Greek are *kaumatizō* 'subject to heat (kauma)' or 'subjected to heat, suffer from heat' and *hellēnizō* 'make Greek, hellenize' or 'act as a Greek, speak Greek' (Marchand, 1969, p. 318). Derivatives built with the suffix *-ιζειν*, the Greek counterpart to *-isen*, passed into Latin and became latinized as verbs in *-izare* (Cockburn, 2010, p. 106). These verbs came into Old French from Latin. The verbal derivatives found in Old French have either the suffix *-isier*, *-izier*, or *-iser*. Most significantly, the verbal derivatives found in Greek, Latin, and Old French belonged primarily to the philosophical and ecclesiastical sphere ('-ize, suf.', OED, Proffitt, 2015).[5]

6.1 Categorization of the *-isen* Simplex Copies

The classification of the *-isen* verbs consisted of the following steps. First, the MED entry of each *-isen* verb derived from the corpora was investigated, and the senses and subsenses were collected in a table. The additional *-isen* verbs that occur in the MED but are not attested in the corpora were collected in a separate table with the examples and subsenses indicated in the MED. Because of this, two separate classification tables are provided in the appendix.

Appendix A.1 includes the verbs from the corpora and indicates the number of hits derived from the corpora. Appendix A.2 depicts the verbs extracted from the MED. This difference in

[5]The MED entry of *-isen* indicates that the grapheme < i > is written with a macron (*-īsen*). In this study, the suffix is written without a macron above the grapheme < i > for reasons of consistency and simplicity ('-isen, suf.', McSparran et al., 2001).

the collection of verbs was made as preparation for a follow-up study that will account for the diachronic development and productivity of verbs with the suffix *-isen*. Regarding the *-isen* verbs extracted from the MED, the number of examples provided in the MED is indicated in the right-hand column to show how many additional sentences have been analyzed qualitatively.

The current study is related to a corpus-based study of the Middle English derivational suffix *-fien*. Lang (2022) differentiates in terms of a qualitative investigation of *-fien* simplex copies between two classes of causative verbs: physical/material (CA) and abstract causative (AS). Verbs subsumed under the former class denote that an animate (physical) or inanimate (material) entity undergoes a change of state (Lang, 2022, p. 16). The latter class accounts for abstract causative events that either indicate that a sentient being undergoes a change in mental status or receives a property on an abstract level such as glory (Lang, 2022, p. 30).

By considering the general difference between these causative "macro classes", the causative subsenses of the *-isen* verbs were classified as either displaying an abstract causative sense or a sense that indicates the affectedness of an animate (i.e., physical) or inanimate (i.e., material) entity. This generalized classification was made to get an overview about the semantic differences and similarities between the causative subsenses and the displayed events.

In the third step, all extracted sentences were more specifically investigated with the help of the parameters of causativity and Pizzolante's (2017) causative classes. In this regard, it was possible to make further subdivisions between five physical/material causative subclasses (CA) and two abstract causative subclasses (AS). Each causative subclass will be introduced and specified during the analysis. In addition, a generalized event semantic representation with the corresponding parameter settings and potential Causer and Causee arguments will be presented for each class.

For the sake of illustration, Table 4 presents an overview of the classified verbs based on the coarse-grained classification between the physical/material causative (CA) and abstract causative class (AS) as proposed by Lang (2022, p. 13). Significantly, the subsequent investigation will show that such a generalized classification is not appropriate to account for the properties of polysemous causative verbs.

Some of the extracted *-isen* verbs display animacy-related constraints. To account for the semantic requirements of the *-isen* verbs, it is essential to briefly elaborate on the difference between three notions: *living*, *animate*, and *sentient*. Living beings such as humans, animals,

Table 4: Generalized classification of the 15 *-isen* verbs

Class		*-isen* verbs
(CA)	Physical/Material Causative	*cauterizen; pulverisen; chastisen*
(AS)	Abstract Causative	*baptisen; canonizen; rebaptisen; fraunchisen; anientisen; intronizen*
(NC)	Non-Causative	*solempnisen; evangelisen; prophetisen; marchaundisen; recognisen; auctorisen*

and plants are defined as animate. They possess an organism and an inherent energy source (García García et al., 2018, p. 28). However, not all animate entities are capable of sentience. According to the OED, sentience is the condition of being conscious and susceptible to sensation ('sentience, n.', OED, Proffitt, 2015). This condition is generally attributed to humans and animals but not to plants (Dahl, 2008, p. 145; García García et al., 2018, p. 35; Sheets-Johnstone, 2009, p. 387).

In contrast to plants, sentient beings can be punished, tamed, or disciplined and undergo a change in mental status, which might manifest itself in a changed behavior (Mallatt et al., 2021, p. 471). In addition, metaphysical beings like deities and abstract entities such as a soul or spirit are also regarded as sentient beings that might undergo a change in a metaphorical or metonymical context (García García et al., 2018, p. 30; Rappaport Hovav, 2008, p. 141). As will be shown in the subsequent analysis, differentiating between animacy and sentience is relevant to account for the semantic constraints displayed by the *-isen* verbs. The feature *animate* is attributed to every living being possessing an organism, including humans, animals, and plants, while *sentience* is only attributed to humans, animals, or metaphysical beings (Mallatt et al., 2021, p. 468).

6.2 The Physical/Material Causative Class

The scope of this study does not allow to present an analysis of each *-isen* verb. Because of this, prototypical members of each causative subclass will be analyzed. The selected verbs are the ones that occur most frequently with one of their subsenses in a specific causative subclass. The investigation starts with the *-isen* verbs denoting senses with the highest degree of causativity and ends with the verbs occurring exclusively with abstract causative senses.

6.2.1 Cauterizen

As a starting point, the verb *cauterizen* will be analyzed. This verb is one of the exceptional simplexes that displays just one sense.

Table 5 shows that *cauterizen* is exclusively used in a medical context. Importantly, this verb is extracted from the MED but not attested in the corpora, which is the reason why no number of hits is indicated in the table. The event of *cauterizing* indicates that a part of an animate being (i.e., an ulcer or wound) undergoes a transformation by being burned or branded with a hot iron. Therefore, this event can be further subclassified as denoting the *termination* of an ulcer or a wound. Such an event is subsumed under the CA-Termination class (Pizzolante,

Table 5: Classification of *cauterizen*

Verb	MED Definition: Senses	Senses	Causative Subclasses
cauterizen (CA)	1. (a) To cauterize;	1a. (CA)	CA-Termination
	(b) *ppl.* cauterizing (medicine).	1b. (CA)	CA-Termination

2017, p. 100). Consider the following example:

(18) ***Þou muste cauterize þe vlcus*** *aboue with an instrument of gold.*
you must cauterize the ulcer above with an instrument of gold.
'You must cauterize the ulcer above with an instrument of gold.'
Lanfranc (Ashm 1396)84/3
(as cited in 'cauterizen,v.', MED, McSparran et al., 2001)

The event in (18) is an instruction to cauterize an ulcer. The desired resultant state is the complete elimination of the *vlcus* (PDE ulcer), which has the semantic role Patient (Levin & Rappaport Hovav, 1995, p. 93). Most significantly, the Causer must be human since only humans can use an instrument to cauterize a substance ('cauterize, v.', OED, Proffitt, 2015). A flame might be involved in cauterizing the *vlcus*, but carrying out the activity of cauterizing requires an Agent in full control of his or her action (Wright, 2002, p. 342).

In addition, the event in (18) could not be perceived as occurring spontaneously (Haspelmath, 1993, p. 90). From this it follows that *cauterizen* does not detransitivize since it displays semantic restrictions, specifying that the eventuality cannot evolve independently (Levin & Rappaport Hovav, 1995, p. 103). An intransitive use of the verb *cauterizen* in a sentence like (19) **The ulcer cauterizes* is ungrammatical. Table 6 presents the generalized event semantic representation of the CA-Termination class with the indicated parameter settings and the resultant state of the event. Importantly, the table depicts the possible semantic roles of the Causer and Causee based on the investigation of the events. Such a definition of the semantic roles is provided for each causative class.

A Causer(e,x) carries out an activity (Cause(e,e′)) through which the Causee(e′,y) undergoes a change of state that includes the complete transformation of this entity. Accordingly, such a complex event is inherently telic since it indicates the outcome of the event (Smith, 1997, p. 19). The Causer exerts physical energy on the Causee (i.e., the *vlcus*), and the resultant state *s* is the non-existence of this entity. Importantly, the first subevent immediately temporally precedes the change-of-state event (Piñón, 2001b, p. 290).[6]

[6]Pizzolante (2017, p. 101) uses the index *c* to differentiate between termination on a concrete and abstract dimension.

Table 6: Generalized representation: CA-Termination (based on Pizzolante (2017, p. 101))

Causer (e,x) $\stackrel{\text{def}}{=}$ Agent (e,x)	Causee (e′,y) $\stackrel{\text{def}}{=}$ Patient (e′,y)
	Resultant State (s,y) $\stackrel{\text{def}}{=}$ non-existence of Causee
Event Semantic Representation:	
λyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ ¬Existent(c)(s) ∧ Causee(s,y)]]]	
Parameter Settings:	
Parameter A. Volitionality	B. Affectedness C. Transformation
Value High	High High

If an entity is burned with a hot iron, the resultant state will occur immediately. Such an event can be specified as denoting "direct/manipulative causation" (Shibatani, 1976, p. 14). Shibatani (1976) introduces this term to account for prototypical causative events that indicate a *tight* semantic relation between a Causer and Causee. In view of this, the term direct/manipulative is useful to semantically specify events as depicted in Table 6, denoting that a Patient is ultimately affected and transformed due to the causative event by being exposed to the physical force of the Agent (Shibatani, 1976, p. 15). Accordingly, Table 6 depicts for the parameters of volitionality, affectedness, and transformation a high value. This parameter setting accounts for the CA-Termination class, which is attributed to the single sense displayed by *cauterizen*.

6.2.2 Pulverisen

The second *-isen* verb that displays a high degree of causativity is *pulverisen*. This verb has two senses that can be subsumed under different physical/material causative subclasses: CA-Fragmentation and CA-Transformation (Pizzolante, 2017, pp. 82, 93).

As a preliminary remark, it must be considered that CA-Fragmentation and CA-Transformation events are only attested for the verb *pulverisen*, which is one of the verbs taken from the MED to extend the data set for the qualitative analysis, and for none of the other causative *-isen* verbs. The parameter value settings for these causative events are based on a semantic analysis of only four, respectively, two sentences indicated for *pulverisen* in the MED ('pulverisen, v.', MED, McSparran et al., 2001). If more verbs denoting such types of causative events were obtained, the overall classification and semantic attributes of CA-Fragmentation and CA-Transformation events might be different.

The four sentences subsumed under sense 1a in the MED entry of *pulverisen* denote a causative fragmentation event, and the two MED examples for sense 1b imply that an entity is transformed due to a causative event (cf., 'pulverisen, v.', MED, McSparran et al., 2001). These two types of causative subsenses are semantically related but have different event semantic representations and display different parameter settings.

Table 7: Classification of *pulverisen*

Verb	MED Definition: Senses	Senses	Causative Subclasses	Hits
pulverisen	1. (a) Med. To pulverize (a medical ingredient), reduce to powder	1a. (CA)	CA-Fragmentation	4
(CA)	(b) to sprinkle (a wound) with a powder [...]	1b. (CA)	CA-Transformation	2
In total				6

(20) ***Þe iuyse*** *schal be pressed out and* ***sette to þe son*** *for to dry* ***vnto þat it may be pulverized.***
The juice shall be pressed out and set to the sun for to dry unto that it may be pulverized.
'The juice shall be pressed out and put into the sun to dry so that it might be pulverized.'
Arderne Fistula (Sln 6)85/36
(as cited in 'pulverisen,v.', MED, McSparran et al., 2001)

The compound sentence provided in (20) can be considered as an instruction, which refers to the fragmentation of an inanimate entity (Pizzolante, 2017, p. 93). Notably, the event of *pulverizing* is preceded by the event of pressing out the juice and putting it into the sun. Concerning the event of *pulverizing*, the *son* is depicted as the Causer since the *juice* might be fragmented into powder due to the energy of the sun. Most importantly, the Causer is a natural force subject that does not volitionally and intentionally exert physical energy on the Causee (Van Valin & Wilkins, 1999, p. 313). Something could even accidentally lie in the sun and become pulverized due to the heat of the sun.

This aspect is crucial since the causative event of pressing out the juice that proceeds the causative fragmentation event requires the full control of an Agent but must be seen independently from the second event. The relevant part of (20) is the event of *pulverizing*, in which the *son* is depicted as the Causer. Therefore, the parameter of volitionality is low since *pulverisen* licenses a natural force subject as Cause argument (Van Valin & Wilkins, 1999, p. 313). The parameter of affectedness is middle because the event in (20) denotes the material affectedness of an entity. Exclusively the parameter of transformation has a high value indicating a resultant state that is irreversible (Pizzolante, 2017, pp. 92–93). The juice could not simply be put together and would have the same material shape as beforehand. These findings are presented in Table 8.

Table 8: Generalized representation: CA-Fragmentation (based on Pizzolante (2017, p. 93))

Causer (e,x) $\stackrel{\text{def}}{=}$ Agent (e,x) ∨ Natural Force (e,x)	Causee (e′,y) $\stackrel{\text{def}}{=}$ Patient (e′,y) Resultant State (s,y) $\stackrel{\text{def}}{=}$ Causee is fragmented into its composing units ⟶ Goal (e',z)
Event Semantic Representation: λzλyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ Goal(e′,z) ∃s[e′«s ∧ fragmented-into(z)(s) ∧ Causee(s,y)]]]	
Parameter Settings:	
Parameter A. Volitionality **Value** Low	B. Affectedness Middle C. Transformation High

The generalized event semantic representation provided in Table 8 indicates that a Causer(e,x) performs an activity (Cause(e,e′)) through which the Causee(e′,y) becomes fragmented into its composing units. Therefore, the Goal(e′,z) of the event is the fragmentation of this entity, which has the semantic role Patient.

The flexibility of *pulverisen* in the semantic realization of the Causer is crucial when considering the diachronic development of this verb. Its Modern English equivalent *pulverize* participates in the causative/inchoative alternation (Levin, 1993, p. 28). As already pointed out, verbs that detransitivize are less restricted in the semantic realization of the subject than verbs that resist detransitivization (Levin & Rappaport Hovav, 1995, p. 102). This applies to *pulverisen* but not to *cauterizen*, which licenses only an agentive Causer. Coupled with this, the event in (20) cannot be perceived as denoting direct/manipulative causation since the sun is a natural force and not an Agent (Shibatani, 1976, p. 14; Piñón, 2001a, p. 351). The event of pulverizing a substance can also be induced by a volitional entity that exerts direct/manipulative causation, but the relevant finding is that this is not a semantic requirement lexicalized in the meaning of the verb. If such a restriction were lexicalized in the meaning of the verb, it would not occur in sentences like in (20).

Even though *pulverisen* might be flexible on a semantic level, a denoted event by *pulverisen* is restricted on an aspectual level. The verb *pulverisen* encodes semantically that a resultant state must occur, which refers to the change of state of an inanimate entity that might either be transformed or fragmented (pulverisen, v.', MED, McSparran et al., 2001). Thus, such an event is defined as an Accomplishment with the temporal features [DYNAMIC], [DURATIVE], and [TELIC] (Smith, 1997, p. 26).

As pointed out above, the event in (20) indicates the complete transformation of an inanimate entity and has a high parameter value for the parameter of transformation. Given this parameter setting, *pulverisen* is similar to *cauterizen*. The main difference is that the entity that is affected by the event still exists after being *pulverized* but in another physical shape, whereas the event of *cauterizing* refers to the termination of an animate entity ('cauterizen, v.', MED, McSparran et al., 2001). Because of this, it can be stated that the CA-Fragmentation class displays a slightly lower degree of causativity than the CA-Termination class. The difference lies in the parameters of volitionality and affectedness, which are both high for the CA-Termination class but low, respectively middle for the CA-Fragmentation class.

It must be considered that Pizzolante (2017) regards the verb *pulvériser*, the French equivalent to *pulverisen*, as a prototypical fragmentation verb (p. 93). However, the Middle English verb has with subsense 1b not a causative fragmentation but rather a transformation sense. Considering the following example:

(21) *Þat is conuenient in* ***wondez,*** [...] *þat þe place* ***be puluerised with puluer constrictive.***
That is convenient in wounds, [...] that the place be pulverized with pulver constrictive.
'That is convenient in wounds, [...] that the place is pulverized with thickening powder.'
Chauliac(1) (NY 12)63b/b
(as cited in 'pulverisen,v.', MED, McSparran et al., 2001)

Table 9: Generalized representation: CA-Transformation (based on Pizzolante (2017, p. 82))

Causer (e,x) $\stackrel{def}{=}$ Agent (e,x)	Causee (e′,y) $\stackrel{def}{=}$ Patient (e′,y) Resultant State (s,y) $\stackrel{def}{=}$ Causee is transformed $\rightarrow$ Goal (e',z)
Event Semantic Representation: λzλyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ Goal(e′,z) ∧ ∃s[e′«s ∧ ∧ Transformed(s) ∧ Causee(s,y)]]]	
Parameter Settings:	
Parameter A. Volitionality	B. Affectedness C. Transformation
Value High	High High

The sentence presented in (21) depicts that an entity undergoes a change of state by being transformed with the help of thickening powder. Sentence (21) is a subjunctive construction that does syntactically not encode a formal subject. Even though no subject is syntactically realized, an agentive Causer should be involved since subsense 1b indicates that someone "sprinkle[s] a wound with a medicinal powder" (pulverisen, v.', MED, McSparran et al., 2001). The event semantic representation of CA-Transformation is provided in Table 9.

To put it in prose, an agentive Causer performs an activity, namely sprinkling a wound with *puluer* (PDE powder), and the Goal of the event is the transformation of the Causee. Given the semantic difference between (20) and (21), the parameter of affectedness is defined as middle for CA-Fragmentation but is regarded as high for CA-Transformation. A CA-Transformation event might involve the physical or material affectedness of an entity, but CA-Fragmentation is restricted in denoting the material affectedness of an inanimate entity (Pizzolante, 2017, pp. 79, 92).

6.3 The Crossing from the Physical/Material to the Abstract Domain

The previous section showed that *pulverisen* has two physical/material causative senses that are closely related, but fine-grained semantic differences between these senses exist. Considering this observation, the notion of polysemy comes into play (Plag et al., 2018; Rainer, 2014; Vicente & Falkum, 2017). In most general terms, polysemy is "characterized as the phenomenon whereby a single word form is associated with two or several related senses" (Vicente & Falkum, 2017, p. 1). Thus, polysemous words have the property to express more than one single meaning. The subsequent section presents two *-isen* simplex copies that are highly polysemous lexicalizing multiple physical/material causative as well as abstract causative senses.

6.3.1 Chastisen

The *-isen* verb *chastisen* is a highly polysemous verb. As indicated in Table 10, this verb has multiple causative subsenses.

The subsenses of *chastisen* can be subdivided into two causative subclasses: CA-Damage and A-Mental-Change (Pizzolante, 2017, pp. 98, 127). Let's consider in the first step an example of the causative damage subsense 3b.:

Table 10: Classification of *chastisen*

Verb	MED Definition: Senses	Senses	Causative Subclasses	Hits
chastisen	1. (a) To correct or improve someone's behavior; discipline or reform (sb.)	1a. (AS1)	A-Mental-Change	4
(CA)	(b) to instruct or train (sb.) […]	1b. (AS1)	A-Mental-Change	4
	2. (a) To punish (sb.) for an offense	2a. (CA)	CA-Damage	8
	(b) to subject to suffering	2b. (CA)	CA-Damage	3
	3. (a) To subdue (an enemy)	3a. (CA)	CA-Damage	1
	(b) to bring under control or subdue (the flesh, the body)	3b. (CA)	CA-Damage	2
	4. (a) To train (an animal), correct a fault by training […]; (b) to punish or discipline (a dog)	4. (AS1)	A-Mental-Change	—
In total				22

(22) *and sit putten hym on te cros* ***to chastien his flesch****, as Powle dide …*
and then put him on the cross to chastise his flesh, as Paul did …
'and then put him on the cross to chastise his flesh, as Paul did …'
(CMWYCSER,392.3003)

The event in (22) can be interpreted as a metonymic shift of the Causee's referent. The term *metonymy* indicates that a word is used figuratively and might refer to a part-to-whole or whole-to-part relationship (Cann, 2019, p. 190). As depicted in the infinitive clause, *his flesch* (PDE flesh) is chastised, thus the body of someone. Example (22) depicts the physical affectedness of a sentient being. Considering verbs like *chastisen* and *pulverisen*, causative events denoted by these verbs indicate the complete physical or material transformation of an entity. However, this does not apply to (22) since the affected entity is not entirely transformed due to the causative event but rather harmed. Therefore, the parameter of transformation would be middle in this instance.

Moreover, *chastisen* is highly restricted concerning the semantic realization of the Causer. The verb licenses exclusively humans as Cause argument since natural forces or animals can neither punish, train, or discipline someone (Sheets-Johnstone, 2009, p. 377; Van Valin & Wilkins, 1999, p. 317). Accordingly, the parameter of volitionality is high. The generalized event semantic representation for CA-Damage with the corresponding parameter settings is provided in Table 11.

A Causer exerts physical energy on a Causee; as a resultant state, the Causee is either physically injured or materially damaged (i.e., P¬damage). The Cause argument must be an Agent,

Table 11: Generalized representation: CA-Damage (based on Pizzolante (2017, p. 98)

Causer (e,x) $\stackrel{\text{def}}{=}$ Agent (e,x)	Causee (e′,y) $\stackrel{\text{def}}{=}$ Patient (e′,y)
	Resultant State (s,y) $\stackrel{\text{def}}{=}$ Causee is "damaged"
Event Semantic Representation:	
$\lambda y \lambda x \lambda e[\exists e'$ [(Causer(e,x) $\wedge$ Cause(e,e′) $\wedge$ Causee(e′,y) $\wedge \exists s[e' \ll s \wedge P_{\neg \text{damaged}}(s) \wedge$ Causee(s,y)]]]	
Parameter Settings:	

Parameter	A. Volitionality	B. Affectedness	C. Transformation
Value	High	High	Middle

and the Causee has the semantic role Patient since this entity undergoes a change of state (Levin & Rappaport Hovav, 1995, p. 50). The restrictiveness of *chastisen* concerning the semantic realization of the Causer becomes apparent by considering the following abstract causative event:

(23) ***Whan þei [dogs].. bene not chastised*** *þerof, þei shul euyr more be lavey and wilde.*
When they [dogs].. been not chastised thereof, they shall ever more be unruly and wild.
'When they [dogs]…will not be chastised thereof, they shall be forever unruly and wild.'
York MGame (Vsp B.12)61
(as cited in 'chastisen,v.', MED, McSparran et al., 2001)

(23) is an example of the change in mental status sense 4a "to train (an animal), correct a fault by training" ('chastisen, v.', MED, McSparran et al., 2001). The desired outcome of the event is that the *dogs* undergo a change in their mental status by being trained. In this regard, the event denotes a scalar change (Rappaport Hovav & Levin, 2010, p. 7). Training an animal is a gradual process. Therefore, a change is processing along a scale, which is in terms of subsense 4a, a scale that is abstract and refers to an abstract endpoint (Rappaport Hovav & Levin, 2001, p. 782).

The fact that a mental change must be involved in (23) is depicted through the main clause *þei shul euyr more be lavey and wilde*. If the dogs are not trained, they will be forever unruly and wild. As pointed out above, only sentient beings can be trained or disciplined, and only humans can perform the activity of training someone (García García et al., 2018, p. 32). The Causee cannot be defined as a Patient since the event in (18) does not denote the physical affectedness of an entity but rather indicates that a sentient being undergoes a cognitive, mental, or emotional experience (Van Valin & LaPolla, 1997, p. 85).

Significantly, the event in (23) proceeds on an abstract level, and abstract causative events can generally be defined as less strongly causative than physical/material causative events since the parameter of affectedness is low. As already mentioned, a transformation on a mental level is indicated in (23), which is why the parameter of transformation is middle rather than

Table 12: Generalized representation: AS1-Mental-Change (based on Pizzolante (2017, p. 130)

Causer (e,x) $\stackrel{\text{def}}{=}$ Agent (e,x)	Causee (e′,y) $\stackrel{\text{def}}{=}$ Experiencer (e′,y)
	Resultant State (s,y) $\stackrel{\text{def}}{=}$ Mental status of Causee is changed
Event Semantic Representation:	
$\lambda y \lambda x \lambda e[\exists e'$ [(Causer(e,x) $\wedge$ Cause(e,e′) $\wedge$ Causee(e′,y) $\wedge \exists s[e' \ll s \wedge P_{\text{mental-i+1}}$ (s) $\wedge$ Causee(s,y)]]]	
Parameter Settings:	

Parameter	A. Volitionality	B. Affectedness	C. Transformation
Value	High	Low	Middle

low (Lang, 2022, p. 30). Table 12 presents the event semantic representation of the A-Mental-Change class.

The event semantic representation shown in Table 12 denotes that a Causer performs an activity that initiates a change in the mental status of the Causee, which must be a sentient being. Consequently, the mental status of this sentient being is transformed due to the causative event indicated by the index $P_{mental\text{-}i+1}$. In light of this, the Causee has the semantic role Experiencer (Rappaport Hovav & Levin, 2015, p. 601).

6.3.2 Fraunchisen

The analysis continues with *fraunchisen*, which is the most polysemous *-isen* verb of the investigation. This verb is extracted from the MED but is not attested in the corpora. The most salient subsenses displayed by *fraunchisen* are depicted in Table 13.

The subsenses are subdivided into three causative subclasses: A-Mental-Change, A-Causative-Transfer, and CA-Removal. An example of an A-Mental change event is depicted in (24). The event in (24) is semantically similar to the A-Mental change event provided for the verb *chastisen* in example (23).

(24) *Oure lorde* ***Ihesu Crist****.. receiued dethe for oure redempcion and deliueraunce, and*
Our Lord Jesus Christ.. received death for our redemption and deliverance, and
fraunchised us of all thraldome*.*
franchised us of all thraldome.
'Our Lord Jesus Christ died for our redemption and deliverance and franchised us from all thraldom.'

Knt.Tour-L.(Hrl 1764)143/27
(as cited in 'fraunchisen,v.', MED, McSparran et al., 2001)

Sentence (24) has a figurative interpretation. Humanity is *fraunchised* from *all thraldome* (PDE thraldom) due to the death of Jesus Christ. The antecedent of the pronoun *us* is not indicated. Considering the sentence context, it seems most likely that *us* refers to humanity as a whole. Notably, the event in (24) indicates that a sentient being is on an abstract level affected by the event by becoming figuratively free, and the abstract affectedness does, on an underlying level, involve a mental transformation. The resultant state is the figurative liberation of an entity.

Table 13: Classification of *fraunchisen*

Verb	MED Definition: Senses	Senses	Causative Subclasses
fraunchisen	1. (a) To set free –used fig.; (b)to liberate (a people or nation); (c) to allow (someone) freedom of choice.	1. (AS1)	A-Mental-Change
(AS)	2. (a.1) To exempt (someone from the power of God)	2.a.1 (AS1)	A-Mental-Change
	(a.2) free (someone from fear)	2.a.2 (AS1)	A-Mental-Change
	(a.3) rid (a day of bad weather);	2.a.3 (CA)	CA-Removal
	(a.4) preserve (a body from decay);	2.a.4 (CA)	CA-Removal
	(b) to grant (someone) a special right or privilege	2b. (AS2)	A-Causative-Transfer
	(c) to grant privileged status to (a church [...], town, university)	2c. (AS2)	A-Causative-Transfer

Prior to the event, the Causee had the property *+thraldom,* and due to the death of Jesus Christ, the property switched to *-thraldom.* Therefore, this event denotes, on a figurative level, a change in mental status event that goes together with a figurative affectedness (Lang, 2022, p. 22). Consequently, the parameter setting for the A-Mental-Change event in (24) is identical to the parameter setting of the A-Mental-Change event of *chastisen* presented in (23). The parameter of volitionality is high; the parameter of transformation is middle, and only the parameter of affectedness is low in this regard.

As indicated in Table 13, *fraunchisen* has multiple causative subsenses. A semantically quite specific subsense that displays a low degree of causativity is CA-Removal.

(25) *... **that day** was so devided, And **ffraunchised ffrom mistys and ffrom Reyn**.*
... that day was so divided, and franchised from mist and from rain.
'that day was so divided, and franchised from mist and from rain.'
Lydg.Hen.VI Entry (Jul B.2)18
(as cited in 'fraunchisen,v.', MED, McSparran et al., 2001)

Sentence (25) has the underlying meaning "to rid a day of bad weather" ('fraunchisen, v.', MED, McSparran et al., 2001). This example is semantically particularly interesting since, on the one hand, a change-of-state event is indicated, but, on the other hand, the event proceeds on an abstract level. A rainy and misty day is freed from bad weather; thus, the resultant state is a different kind of environment with good weather. However, the activity event that precedes the causative event is situated on an abstract level. Only natural forces or divine

Table 14: Generalized representation: CA-Removal (based on Pizzolante (2017, p. 107)

Causer (e,x) $\stackrel{\text{def}}{=}$ Agent (e,x) ∨ Natural Force (e,x)	Causee (e′,y) $\stackrel{\text{def}}{=}$ Patient (e′,y) Resultant State (s,y) $\stackrel{\text{def}}{=}$ Property is removed from Causee
Event Semantic Representation: $\lambda y \lambda x \lambda e[\exists e'$ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ $\exists s[e' \text{«} s \wedge P_{\neg \text{property(c)}}(s) \wedge$ Causee(s,y)]]]	
Parameter Settings:	

Parameter	A. Volitionality	B. Affectedness	C. Transformation
Value	Middle	Middle	Middle

beings can initiate such a change-of-state event (Levin & Rappaport Hovav, 1995, p. 85; Van Valin & Wilkins, 1999, p. 317). Taken to its logical conclusion, an abstract activity event instigates a change-of-state event.

Considering this semantic peculiarity, (25) could be defined as a "multidimensional causative event" since the event incorporates an abstract and physical/material dimension. The parameter of volitionality is low since the Causer is not restricted to be realized as an Agent. This is also depicted in Table 14. In addition, the removal of bad weather does not involve a complete transformation of the environment itself but rather indicates a change in its condition. Weather conditions can change daily, but if an entity is *pulverized* or *cauterized*, the transformation is irreversible. Because of this, the parameter of transformation is middle with respect to the subclass CA-Removal (Pizzolante, 2017, p. 107).

The event semantic representation for CA-Removal denotes that a Causer performs an activity event that causes the removal of a physical or material property of the Causee. As indicated in the event semantic representation, the activity subevent temporally precedes the change-of-state event (Piñón, 2001a, p. 352). Essentially, a causative removal event does similarly to the previously presented events, convey completion, and is dynamic and durative (Smith, 1997, p. 68). In this property lies the aspectual similarity between all analyzed causative events.

6.4 The Abstract Causative Transfer Class

The abstract causative classes defined as the A-Mental-Change and the A-Causative-Transfer class are the largest causative classes of the current investigation. This finding might be related to the fact that historical corpora such as the PPCME2 comprise texts from a restricted number of genres, which are primarily religious texts (Kroch & Taylor, 2000). More than half of the *-isen* verbs display an abstract causative transfer sense that are embedded in a religious context. The subsequent section focuses on A-Causative-Transfer class, which can be defined as the class denoting the lowest degree of causativity.

Table 15: Classification of *intronizen*

Verb	MED Definition: Senses	Senses	Causative Subclasses
intronizen (AS)	1. To enthrone (a bishop, pope, or emperor); invest (sb.) with episcopal, papal, or imperial authority	1. (AS2)	A-Causative-Transfer

6.4.1 Intronizen

The verb *intronizen* is extracted from the MED and has just one sense, which is depicted in Table 15. This sense indicates that an abstract property is transferred to a human.

(26) ***Theodosius*** *þe þirde* ***was intronized*** *by þe same knytis.*
Theodosius the third was enthronized by the same knight
'Theodosius the third was enthroned by the same knight.'

Capgr.Rome (Bod 423)58
(as cited in 'intronizen,v.', MED, McSparran et al., 2001)

The event in (26) denotes that *Theodosius* received the characteristic of being a king due to his enthronization. Because of this, the Causee (i.e., *Theodosius*) is not a Patient that is physically or mentally affected but rather a Recipient (Levin & Rappaport Hovav, 2005, p. 29). The Causer must be an Agent, an entity that is acting volitionally and is in full control of the action (Beavers & Koontz-Garboden, 2020, p. 13).

The A-Causative-Transfer class has not a direct equivalent concerning Pizzolante's (2017) classes but has rather been developed by synthesizing the results from a previously conducted analysis of abstract causative *-fien* verbs with the findings concerning the semantic and syntactic properties of the abstract causative *-isen* verbs of the current study (Lang, 2022, p. 33).

The developed abstract causative transfer class is similar to the *ornative class* that is incorporated into Plag's (1999) and Lieber's (2004) lexical semantic decomposition approaches. The *ornative class* is attributed to verbal derivatives denoting the meaning 'make x go to someone' (Lieber, 2004, p. 84; Plag, 1999, p. 125). Crucially, this class is semantically similar to the A-Causative-Transfer class but not identical to it. According to Plag (1999), ornatives indicate, on an abstract level, a change of place (p. 129). In contrast to ornatives, abstract causative transfer events are defined as more flexible regarding their underlying event structure. Such events might denote a change of place, but they can also indicate that an abstract property or characteristic of an entity is changed due to the causative event, such as the religious status. The event semantic representation of the A-Causative-Transfer class with the corresponding parameter settings is presented in Table 16. This representation accounts for all verbs with a subsense that displays an abstract causative transfer event and will only be provided once during the analysis.

A Causer either transfers an abstract entity to or from a Recipient or performs an activity that initiates a change in an abstract property of a sentient being. Fundamentally, the event does not denote a change in mental status (cf. Lang, 2022, p. 39). The resultant state is a change in an abstract property of the Causee, such as having the characteristic of being a king. In (26), an entity receives the characteristic of being a king, which is the reason why the Causee can be identified as a Recipient rather than an Experiencer (Rappaport Hovav & Levin, 2015, p. 601). Coupled with this, the Causer must be an Agent since non-agentive entities cannot enthrone somebody (García García et al., 2018, p. 32; Wright, 2002, p. 343).

Table 16: Generalized representation: AS2-Causative-Transfer (based on Pizzolante (2017, p. 115)

Causer (e,x) $\stackrel{def}{=}$ Agent (e,x)	Causee (e′,y) $\stackrel{def}{=}$ Recipient (e′,y) Resultant State (s,y) $\stackrel{def}{=}$ Abstract property is in possession of Causee
Event Semantic Representation: λyλxλe[∃e′ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ $_{\text{abstract property-i+1}}$ (s) ∧ Causee(s,y)]]]	
Parameter Settings:	

Parameter	A. Volitionality	B. Affectedness	C. Transformation
Value	High	Low	Low

Causation is relevant to transfer an abstract property to an entity, but such an event differs significantly from an event that indicates that a sentient being is mentally transformed (Plag, 1999, pp. 128–129). The parameter of transformation can be defined as having a low value concerning an abstract causative transfer event. A low value accounts for a transformation in an abstract property of a sentient being without indicating a transformation on a mental level. Considering the difference between the A-Mental-Change class displayed by subsense 1b and 4 of *chastisen* and subsenses 1, 2a.1, and 2a.2 of *fraunchisen*, and the A-Causative-Transfer class introduced above, it can be stated that the latter class denotes a lower degree of causativity than the former (Lang, 2022, p. 36). The difference in the parameter realization and the corresponding difference in the event semantic representations makes it possible to draw a clear semantic dividing line between both abstract causative classes.

6.4.2 Baptisen

Another member of the A-Causative-Transfer class is *baptisen*. This verb denotes in its semantic core a transitive meaning, similar to the formerly analyzed verbs.

Table 17 shows that *baptisen* is most productive with sense 1a. A human being baptizes another human being "for ceremonial purification or for sacramental initiation into the Christian Church" ('baptisen, v.', MED, McSparran et al., 2001). An example of this sense is provided in (27).

(27) ***I Baptise te*** *in te name of te Fadir and te Sonne and te Haly Gaste.*
I baptize you in the name of the Father and the Son and the Holy Ghost.
'I baptize you in the name of the Father and the Son and the Holy Ghost.'
(CMGAYTRY,8.79)

The abstract causative transfer event in (27) indicates that a Causer performs an activity through which the Causee receives the abstract property of being baptized (Groenwald, 2003,

Table 17: Classification of *baptisen*

Verb	MED Definition: Senses	Senses	Causative Subclasses	Hits
baptisen	1. (a) To baptize (sb.), [...] into the Christian Church	1a. (AS2)	A-Causative-Transfer	92
(AS)	(b) to perform the rite or sacrament of baptism	1b. (AS2)	A-Causative-Transfer	14
	(c) refl. to receive baptism [...]	1c. (AS2)	A-Causative-Transfer	4
	2. (a) To sanctify (sb.)	2a. (AS2)	A-Causative-Transfer	7
	(b) to cleanse	2b. (AS2)	A-Causative-Transfer	1
In total				118

p. 371). Therefore, this entity can be perceived as a Recipient rather than an Experiencer that undergoes a change on a mental or emotional level (Levin & Rappaport Hovav, 2005, pp. 14–15).[7]

Coming back to the parameters of causativity, the conclusion can be drawn that *baptisen* displays, like the former verbs with an abstract causative transfer sense, a low degree of causativity. The event of *baptizing* does not involve a transformation on a mental level (Pizzolante, 2017, p. 115). The baptized person might undergo a change in mental status, but this is not a priori the case (Weber, 2005a, p. 461). For instance, if infants are baptized, they will not understand what is happening to them and, consequently, not change their mental attitudes or religious beliefs. In view of this, the outcome of the event is the transfer of an abstract property, namely the property of being baptized or, more specifically, being a member of the church (Pizzolante, 2017, p. 115).

Furthermore, the parameter of affectedness is low since the event proceeds on an abstract level. More concretely, the property of *being baptized* is transferred to a human being that has the semantic role Recipient (Pizzolante, 2017, p. 114). In this regard, the verb semantically specifies the resultant state, which is the state of *being baptized*.

Exclusively the parameter of volitionality is high since *baptisen* displays animacy-related constraints. The Causer must be realized as an Agent, which must be a human being (Weber, 2005b, p. 463). This is a generalized constraint of both abstract causative subclasses. All verbs denoting an abstract causative sense require a human as the instigator of the causative event (cf. Lang, 2022, p. 22).

[7] The verb *baptisen* is one of the few causative verbs with a French equivalent concerning Pizzolante's investigation. Pizzolante's (2017, p. 114) "A-Sachlich-Ändern" class is similar but not identical to the abstract causative transfer class. The "A-Sachlich-Ändern" class subsumes abstract causative events that denote primarily the change of the religious or legal status of an entity (Pizzolante, 2017, pp. 114–115).

6.5 The Non-Causative Class

In the last step, it is essential to briefly comment on the non-causative class. This class consists of six *-isen* simplex copies: *solempnisen*, *evangelisen*, *prophetisen*, *marchaundisen*, *recognisen*, and *auctorisen*. Each of these verbs has different non-causative senses. Due to the limited scope of this study, I will exclusively elaborate on the *-isen* verb *evangelisen*.

The MED entry of *evangelisen* indicates the following sense: "To bring or proclaim good tidings; to preach the Gospel; to preach" ('evangelisen, v.', MED, McSparran et al., 2001). This sense displays a non-causative meaning, which could be paraphrased as "do x". Crucially, the underlying meaning "do x" is denoted by a specific class of verbs called *performatives* (Lieber, 2004, p. 86; Plag, 1999, p. 125).

Lieber (2004) specifies performative verbs as intransitive verbs. Such verbs have the underlying meaning "do x" or "act like x" (p. 77). Notably, performative verbs are non-core cases of *-ize* and *-ify* derivatives (Lieber, 2004, p. 86). These verbs denote an activity event and are, therefore, atelic referring to an arbitrary final endpoint (Smith, 1997, p. 83). Examples of such verbs are *philosophize*, and *speechify* (Lieber, 2004, p. 77).

Even though *evangelisen* occurs almost exclusively in intransitive sentence constructions denoting the underlying non-causative meaning "do *evangelize*", this verb occurs additionally in a transitive argument structure pattern. Most significantly, the displayed transitive construction does not denote a causative meaning.

(28) *Þof we or an awngelle of heuyn* ***ewangelyse*** *to ȝou.*
though we or an angel of heaven evangelize to you.
'though we or an angel of heaven preach the Gospel to you.'
Paul.Epist.(Corp-C 32)Gal.1.8
(as cited in 'evangelisen,v.' MED, McSparran et al., 2001)

The example provided above is a transitive construction, consisting of the compound subject *we or an awngelle of heuyn* and the prepositional phrase (PP) *to ȝou* (PDE you). The formal subject is an Agent, an entity that is acting volitionally, performing the activity of preaching. The PP object has the semantic role Recipient, an entity that receives or hears on an abstract level a message (Van Valin, 2005, p. 58).

(28) can be regarded as an abstract transfer event, but it is relevant to distinguish this specific event from the abstract *causative* transfer events displayed by the A-Causative-Transfer class. If a message is transferred to a Recipient, the message is not an identifying property or characteristic of the Recipient as a resultant state (Lang, 2022, p. 25). More specifically, the transmitted message is not a characteristic that can be attributed to an entity. Therefore, neither the parameter of affectedness nor the parameter of transformation is realized regarding a transfer of information event (Levin, 1993, p. 202). However, if someone is *enthronized* or *baptized*, the person has a new identifying property due to the causative event and possesses this abstract property (Rappaport Hovav & Levin, 2015, p. 612). Because of this, the entity is affected at an abstract level. Given this difference, it is possible to distinguish abstract transfer events from abstract causative transfer events by considering the displayed parameters of

causativity. Events such as (28) are non-causative events with respect to the proposed parameters of causativity.

6.6 The Hierarchy of Causative Events

The previous sections provided an analysis of seven *-isen* verbs occurring in different argument structure patterns and displaying various types of causative senses. It has been shown that causative events manifest different degrees of causativity. The "degree of causativity" has been operationalized by three parameters that denote different values depending on each causative subclass. For the sake of illustration, this section introduces a causativity hierarchy allowing for a precise classification of causative events.

Table 18: The Hierarchy of Causative Events

Degree of Causativity	Event Semantic Representations: Modified versions based on Pizzolante (2017)
(very high)	CA-Termination (cf. Table 6)
+	λyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ ¬Existent(c)(s) ∧ Causee(s,y)]]]
	CA-Transformation (cf. Table 8)
	λzλyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ Goal(e′,z) ∧ ∃s[e′«s ∧ Transformed(s) ∧ Causee(s,y)]]]
	CA-Damage (cf. Table 11)
	λyλxλe[∃e′ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ $P_{\neg damage}$(s) ∧ Causee(s,y)]]]
	CA-Fragmentation (cf. Table 9)
↓	λzλyλxλe[∃e′[(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ Goal(e′,z) ∃s[e′«s ∧ fragmented-into(z)(s) ∧ Causee(s,y)]]]
	CA-Removal (cf. Table 15)
	λyλxλe[∃e′ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ $P_{\neg property(c)}$(s) ∧ Causee(s,y)]]]
	AS1-Mental-Change (cf. Table 12)
	λyλxλe[∃e′ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ $P_{mental\text{-}i+1}$(s) ∧ Causee(s,y)]]]
–	AS2-Causative-Transfer (cf. Table 14)
(very low)	λyλxλe[∃e′ [(Causer(e,x) ∧ Cause(e,e′) ∧ Causee(e′,y) ∧ ∃s[e′«s ∧ $_{\text{abstract property-i+1}}$(s) ∧ Causee(s,y)]]]

The Hierarchy of Causative Events is presented in Table 18. This hierarchy is the successor model of a previously developed causativity scale that accounts for different degrees of causativity displayed by causative *-fien* verbs (Lang, 2022, p. 29). Causative *-fien* verbs are aligned along this scale concerning their degree of causativity. However, the Causativity Scale requires a conceptual revision because of the following two reasons.

Firstly, due to the polysemy displayed by the investigated causative verbs, it is imprecise to situate individual verbs on a scale since most of them could be subsumed under more than one causative subclass. Therefore, it is more precise to account for different degrees of causativity by schematizing fine-grained differences between different types of causative events rather than verbs. Such a fine-grained subdivision is relevant for exploring the diachronic development of these polysemous causative verbs in follow-up studies.

Secondly, accounting for different degrees of causativity in hierarchical order is a better illustration than in a linear form (Lang, 2022, p. 29). The former format allows for indicating the individual boundary lines between the various stages of the degrees of causativity. Most importantly, the developed generalized event semantic representations for each causative subclass allow schematizing semantic differences in a unified manner. Table 18 shows that each causative subclass denotes a different type of resultant state. However, it must be considered that these causative subclasses and their differing "degrees of causativity" account only for the explored data of this study. Whether these classes are applicable to the events denoted by other causative verbs and their corresponding subsenses must be explored in future work.

The causative subclasses are ordered according to their parameter settings. The higher the combined parameter values for a class, the higher the position in the hierarchy. Importantly, the events with the highest degree of causativity indicate a complete and irreversible transformation of an entity that has the semantic role Patient (Levin & Rappaport Hovav, 1995, p. 93). For instance, *cauterizen* and *pulverisen* denote with their subsense 1a such a transformation ('cauterizen, v.'; 'pulverisen, v.', MED, McSparran et al., 2001). However, the subclass CA-Termination displayed by *cauterizen* denotes a slightly higher degree of causativity than the subclass CA-Transformation, in which *pulverisen* occurs. The termination of an entity refers to its elimination and, consequently, non-existence (Pizzolante, 2017, p. 100). This is represented by subsense 1a of *cauterizen* in example (13).

The subclasses CA-Damage and CA-Fragmentation have a lower degree of causativity than the formerly mentioned subclasses. The CA-Damage class subsumes events referring to the partial transformation of an animate entity (e.g., subsense 3b of *chastisen*), and CA-Fragmentation events depict the transformation of an inanimate entity (e.g., subsense 1a of *pulverisen*).

Notably, an exceptional subclass is CA-Removal. This subclass denotes a much lower degree of causativity than the other physical/material causative classes. For instance, CA-Removal is attributed to the causative sense 2.a.3 of *fraunchisen* "to rid a day of bad weather" ('fraunchisen, v.', MED, McSparran et al., 2001). Given this subsense, the affected entity is restricted in referring to a day.

Causative events that proceed on an abstract level are split into two subclasses: The Change in Mental Status Class (AS1) and the Abstract Causative Transfer Class (AS2). As has been shown, the AS1 class displays a middle value for the parameter of transformation, depicting that a sentient being undergoes a change in mental status (Plag & Kawaletz, 2018, p. 471). In contrast to this subclass, the parameter of transformation has a low value concerning the AS2 class, which makes this class less causative than the former one. The abstract transfer of a property indicates that a sentient being has a new characteristic, but the entity is not transformed on a mental level (e.g., *intronizen* and *baptisen*). In view of this, the AS2 class

denotes the lowest possible degree of causativity (cf. Lang, 2022, p. 22).

7 Conclusion and Outlook

The main goal of the current study was to conduct a qualitative investigation of Middle English *-isen* verbs with a specific focus on causativity. The two leading hypotheses were that causativity is a matter of degree and that *-isen* verbs exhibit a "polysemous behavior". These primary hypotheses were based on the findings of a previously conducted corpus-based study of the Middle English derivational suffix *-fien*, which revealed that *-fien* simplex copies occur in different causative argument structure patterns displaying different semantic properties (Lang, 2022).

This study has demonstrated that causativity is a gradable rather than an absolute phenomenon by accounting for the semantic properties of lexical causative verbs with the help of the three parameters of causativity: *volitionality*, *affectedness*, and *transformation*, and an event semantic analysis based on Pizzolante's (2017) work, which relies on Piñón's formalism (2001a, 2001b).

The qualitative analysis of the *-isen* simplex copies *cauterizen*, *pulverisen*, *chastisen*, *fraunchisen*, *intronizen*, and *baptisen* has shown that subdivisions into causative classes are relevant to account for fine-grained differences between causative events. Most significantly, the degree of causativity can be modeled as differences between causative events subsumed under different causative subclasses. Each causative class has its own event semantic representation and displays different parameter settings.

Coupled with this finding, the investigation revealed that almost all *-isen* verbs are polysemous. Abstractness is a relative but relevant notion regarding the semantic properties of the Middle English verbs and their denoted argument structure patterns (cf. Lang, 2022, p. 16). The fact that the majority of *-isen* verbs have multiple senses makes it challenging to account for the degree of causativity of the individual verbs. As a consequence of this, a hierarchy of causative events has been developed. This hierarchy depicts causative events lexicalized by the subsenses of the investigated verbs in hierarchical order depending on their degree of causativity.

The most obvious finding to emerge from this study is that all physical/material causative events denote a higher degree of causativity than abstract causative events. The reason for this difference is based on the encoded semantic properties of the causative events. Physical/material causative events denote that a Patient is physically or materially affected by the event and undergoes a change of state (Beavers & Koontz-Garboden, 2020, p. 46; Lang, 2022, p. 17; McKoon & Macfarland, 2000, p. 842). The resultant state is either the complete or partial transformation of the affected entity. Abstract causative events might indicate a change in mental status, but such events do not meet the introduced criteria of prototypical causative events.

Lang (2022) already observed the semantic difference between different types of abstract causative events (p. 30). The current study provided further insights into the distinction between such events by unfolding the differences between the Change in Mental Status Class

(AS1) and Abstract Causative Transfer Class (AS2). As depicted by the developed Hierarchy of Causative Events, the latter class denotes the lowest degree of causativity.

Consistent with previous literature on causativity, the investigation showed that prototypical causative events require a formal subject that has the semantic role Agent (Haspelmath, 1993, p. 107; Levin, 2020, p. 193; Martin & Schäfer, 2014, p. 232; Wright, 2002, p. 344). The majority of *-isen* verbs require an Agent as a formal subject, an entity that is acting volitionally and is in full control of the event (Næss, 2007, p. 15). In addition, all *-isen* verbs are externally caused change of state verbs denoting a transitive event that can be paraphrased as "cause to become x" (Levin & Rappaport Hovav, 1994, p. 103).

Finally, a number of important limitations need to be considered. Firstly, this study was unable to provide a detailed qualitative analysis of all *-isen* verbs and each of their displayed argument structure patterns. It was only possible to present prototypical members of each causative class. Secondly, the scope of this study did not allow to go further into detail about the qualitative properties of *-isen* verbs compared to *-fien* verbs, which were explored in a previously conducted study (Lang, 2022). Thirdly, this study made only a basic distinction between Accomplishments, that is, telic events incorporating a natural endpoint, and Activities, which are dynamic events that do not refer to an endpoint (Smith, 1997, p. 23). A more detailed consideration of the domain of aspectuality might be insightful, especially by considering the diachronic development of verbal derivatives (Boogaart, 2004, p. 1167).

In view of this, a natural progression of this work is to account for the diachronic development of verbal derivatives built with the derivational suffixes *-isen* and *-fien*. As stated in the introduction, their Modern English equivalents *-ize* and *-ify* are regarded as productive causativizing suffixes (Plag, 2003, p. 93; Lieber, 2004, p. 76). This study has shown that all Middle English *-isen* verbs are copied simplexes that occur only to a small extent in the Middle English corpora. The same applies to verbs with the suffix *-fien* (Lang, 2022, p. 11). Because of this, accounting for the emerging productivity and development of verbal derivatives built with these suffixes is of empirical relevance. In this regard, it would be important to investigate which of the causative subclasses becomes more productive over time and whether correlations between the different degrees of causativity and the productivity of a subclass exist.

Moreover, it would additionally be relevant to explore the semantic properties of the copied verbal simplexes in their source language (Cockburn, 2010, p. 106). Such an investigation would reveal further insights into diachronic changes in the semantics of verbal simplexes from a cross-linguistic perspective.

To address these questions, another aspect must be considered, which concerns the domain of learnability. Yang's (2016) Tolerance Principle provides an exact calculation of when children start to generalize a rule, regarded as the Tolerance Threshold (p. 60). The Tolerance Principle can optimally be applied to small proportions, making this model quite useful for accounting for historical language data and the emerging productivity of these suffixes (Yang, 2016, p. 66). This principle can be used to tackle how children learn the rules of word-formation (Payne et al., 2021).

Despite the limited scope of this study, the findings gained by the qualitative investigation

of *-isen* verbs do not only provide relevant insights about the semantic as well as syntactic properties of verbal simplexes that came to English due to the language contact with Anglo-Norman, but this study does at the same time make further contributions to the extensively explored notion of causativity.

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Appendix

Table A.1: Classification Table 1. *-isen* Simplex Copies Derived from the Corpora

7 Verbs		MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of hits
baptisen (AS) OED: 1297[8]	1.	(a) To baptize (sb.), either for ceremonial purification or for sacramental initiation into the Christian Church; (b) to perform the rite or sacrament of baptism; (c) refl. to receive baptism, be baptised; (d) to duck (sb.)	1a. (AS2)	A-Causative-Transfer	92
			1b. (AS2)	A-Causative-Transfer	14
			1c. (AS2)	A-Causative-Transfer	4
			1d. (AS2)	A-Causative-Transfer	—
	2.	(a) To sanctify (sb.); (b) to cleanse.	2a. (AS2)	A-Causative-Transfer	7
			2b. (AS2)	A-Causative-Transfer	1
	3.	To give (sb., sth.) a name	3. (AS2)	A-Causative-Transfer	—
In total					118
chastisen (CA) OED: c1330	1.	a) To correct or improve (someone's) behavior; discipline or reform (sb.); (b) to instruct or train (sb.); (c) to reprove or reprimand (sb.); warn by example	1a. (AS1)	A-Mental-Change	4
			1b. (AS1)	A-Mental-Change	4
			1c. (AS1)	A-Mental-Change	—
	2.	(a) To punish (sb.) for an offense, chastise; also, punish (an offense); (b) to subject to suffering for expiation.	2a. CA)	CA-Damage	8
			2b. CA)	CA-Damage	3
	3.	(a) To subdue (an enemy), subjugate; (b) to bring under control or subdue (the flesh, the body).	3a. CA)	CA-Damage	1
			3b. CA)	CA-Damage	2
	4.	(a) To train (an animal), correct a fault by training; to tame or break in (a horse); (b) to punish or discipline (a dog).	4a. (AS1)	A-Mental-Change	—
			4b. AS1)	A-Mental-Change	—

[8]The *-isen* verbs are hierarchically arranged according to their OED entry date.

Table A.1: Classification Table 1. *-isen* Simplex Copies Derived from the Corpora

7 Verbs	MED Senses: Definitions		Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of hits
In total					22
canonizen (AS)	1.	(a) To recognize (sb.) officially as a saint, canonize; (b) to install (sb.) in an ecclesiastical office.	1a. (AS2)	A-Causative-Transfer	1
			1b. (AS2)	A-Causative-Transfer	2
OED: c1380	2.	(a) To establish (sth.) by official action of the Church, grant ecclesiastical approval to; laue canonized, canon law; (b) to accept (sth.) as valid or true by official act of the Church; epistel canonized, one of the Catholic Epistles.	2a. (AS2)	A-Causative-Transfer	2
			2b. (NC)	—	—
In total					5
solempnisen (NC)	1.	(a) To celebrate (a religious festival or day); perform (a religious duty, funeral rites) reverently or with due ceremony; (b) to celebrate (a wedding); perform the ceremony of (marriage); (c) to proclaim (sth.) formally; (d) to celebrate (sb. or sth.) with praise; (e) to confer (power) ceremoniously; (f) to perform (grafting).	1a. (NC)	—	2
			1b. (NC)	—	—
OED: 1382			1c. (NC)	—	—
			1d. (NC)	—	—
			1e. (AS2)	A-Causative-Transfer	—
			1f. (NC)	—	—
In total					2
evangelisen (NC)	1.	(a) To bring or proclaim good tidings; (b) to preach the Gospel; to preach.	1.a (NC)	—	17
			1.b (NC)	—	4
OED: a1382					
In total					21

Table A.1: Classification Table 1. *-isen* Simplex Copies Derived from the Corpora

7 Verbs	MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of hits
prophetisen (NC) OED: ?a1400	1. To prophesy; prophesy (sth.).	1. (NC)	—	1
In total				1
rebaptisen (AS) OED: c1450	1. In phrase: ben rebaptised, to be rebaptized.	1. (AS2)	A-Causative-Transfer	2
In total				2

Table A.2: Classification Table 2. *-isen* Simplex Copies Extracted from the MED

8 Verbs	MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of MED examples
fraunchisen[9] (AS) OED: a1325	1. (a) To set free; --used fig.; (b) to liberate (a people or nation); (c) to allow (someone) freedom of choice.	1a. (AS1)	A-Mental-Change	1
		1b. (AS1)	A-Mental-Change	2
		1c. (AS1)	A-Causative-Transfer	1
	2. (a.1) To exempt (someone from the power of God); (a.2) free (someone from fear); (a.3) rid (a day of bad weather); (a.4) preserve (a body from decay); (b) to grant (someone) a special right or privilege; refl. to gain special rights or privileges; (c) to grant privileged status to (a church, monastery, town, university); fraunchised toun, a town possessing special rights in matters of taxation, self-government, etc.; (d) to make (someone) a freeman of a city or town; to receive (someone) into membership in a craft or guild; fraunchised man, a member of a craft or guild; ?also, a member of the corporation of a city, a citizen.	2.a.1 (AS1)	A-Mental-Change	1
		2.a.2 (AS1)	A-Mental-Change	1
		2.a.3 (CA)	CA-Removal	1
		2.a.4 (CA)	CA-Removal	1
		2b. (AS2)	A-Causative-Transfer	3
		2c. (AS2)	A-Causative-Transfer	5
		2d. (AS2)	A-Causative-Transfer	6

[9]Some subsenses were split into sub-subsenses, which are not originally indicated as sub-subsenses in the MED. For instance, regarding the verb *fraunchisen* multiple sub-subsenses of subsense 2a were detected that are either identified as physical/material causative senses or abstract causative senses. Due to this semantic heterogeneity, the decision was made to split subsense 2a into sub-subsenses to provide a precise semantic classification.

Table A.2: Classification Table 2. *-isen* Simplex Copies Extracted from the MED

8 Verbs	MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of MED examples
	3. (a) To convert (land, an estate) into charterhold or freehold; (b) to free (an estate) from a lien or encumbrance; fig. to free from the claims of Satan; (c) to make (a manor) a sanctuary for criminals; (d) ~ togeder, to be under the jurisdiction of joint possessors.	3a. (AS2) 3b. (AS2) 3c. (NC) 3d. (NC)	A-Causative-Transfer A-Causative-Transfer — —	1 1 1
In total				26
anientisen (AS) OED: a1382	1. (a) To bring to nought, destroy (sth.); eliminate (vice); void (bile); (b) to lessen, diminish (sth.); deplete. 2. To weaken or ruin (sb.); to enfeeble or disable; of a flower: to wither. 3. To humble (oneself), be humble; refl.	1a.1 (AS1) 1a.2 (AS1) 1b. (CA) 2. (CA) 3. (AS1)	A-Mental-Change A-Mental-Change CA-Removal CA-Damage A-Mental-Change	2 3 6 6 2
In total				19
marchaundisen (NC) OED: c1384	1. (a) To engage in commerce, traffic; ~ togeder, engage in mutual trade; ~ with, deal in (a commodity); (b) ~ of, to take advantage of (sb.), exploit.	1a. (NC) 1b. (NC)	— —	5 1
In total				6
recognisen (NC) OED: 1388	1. Law: To resume possession of (land held by a tenant).	1. (NC)	—	2

Table A.2: Classification Table 2. *-isen* Simplex Copies Extracted from the MED

8 Verbs		MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of MED examples
In total					2
intronizen (AS) OED: a1393	1.	To enthrone (a bishop, pope, or emperor); invest (sb.) with episcopal papal, or imperial authority; ppl. intronized, seated on a throne.	1. (AS2)	A-Causative-Transfer	9
In total					9
auctorisen (NC)	1.	(a) To give official sanction to (sth.), approve (an action, a condition, a quality, etc.); to make (a law, treaty, judicial action) legally valid, confirm, ratify; (b) to approve (sb. for a task or position), appoint; authorize (sb. to do sth.).	1a. (NC) 1b. (AS2)	— A-Causative-Transfer	12 3
OED: a1393	2.	(a) To warrant (sth.) to be authentic or true, confirm, vouch for; (b) to regard (a book) as correct and trustworthy, to use as an authority; (c) to regard (sth.) as of great worth or efficacy; honor, venerate.	2a. (NC) 2b. (NC) 2c. (NC)	— — —	6 2 4
	3.	To give validity (to a book), base or ground (a writing upon authorities).	3. (NC)	—	2
	4.	To argue by citing authorities, find authority or grounds (for sth.).	4. (NC)	—	1
In total					30

Table A.2: Classification Table 2. *-isen* Simplex Copies Extracted from the MED

8 Verbs	MED Senses: Definitions	Senses	Causative subclasses (cf. Pizzolante, 2017)	Number of MED examples
pulverisen (CA) OED: ?a1425	1. (a) Med. To pulverize (a medicinal ingredient), reduce to powder; (b) to sprinkle (a wound) with a medicinal powder; sprinkle (vines) with a weed-killing powder.	1a. (CA)	CA-Fragmentation	4
		1b. (CA)	CA-Transformation	2
In total				6
cauterizen (CA) OED: ?1541	1. (a) To cauterize; (b) *ppl.* cauterizing (medicine).	1a. (CA)	CA-Termination	6
		1b. (CA)	CA-Termination	1
In total				7