Chapter 1
Causation: From Metaphysics to Semantics and Back

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Abstract This paper examines reciprocal connections between the discussions on causation in philosophy and in linguistics. Philosophers occasionally seek insights from the linguistic literature on certain expressions, and linguists often rely on philosophers' analyses of causation, and assume that the relevant linguistic expressions denote philosophical concepts related to causation. Through the study of various semantic aspects of causative constructions, mainly targeting the nature of the dependency encoded in various linguistic constructions and the nature of the relata, this paper explores interfaces between the discussions in the two disciplines, and at the same time points to significant differences in their objects of investigation, in their methods and in their goals. Finally, the paper attempts to observe whether the disciplinary line is maintained, i.e. whether or not it is the case that metaphysical questions are examined as linguistic ones and vice versa.

Keywords Cause · Effect · Dependency · Counterfactuality · Causal Selection · Negation · Relata · Metaphysics · Causative constructions

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1.1 Introduction: Philosophical and Linguistic Discussions on Causation

Discussions about the nature of causal relations stood at the heart of philosophical inquiries since the days of the ancient Greek philosophers, most notably in the work of Aristotle. Although, for Aristotle causality was not defined as a unitary notion, as he developed the doctrine of the four causes,[1] at least since the days of the British empiricist David Hume, philosophers attempt to provide a unified account for what stands behind the attribution of the terms "cause" and "effect" to two *things*.

For various philosophers, deliberations on the nature of causal relations, is an attempt to characterize the intuition, broadly described as "the folk theory of causation", implicitly entertained by many (*inter alia* Lewis 2000; Menzies 2009). Consequently, among the objects of their investigation are linguistic expressions that seem to underlie these relations. In other words, such philosophers attempt to provide a conceptual account, in non-causal terms, to all and only cases in which people have an intuition to assert correctly that: "c is the cause of e" (or other causal judgments).[2] From a linguistic point of view, *de facto* such inquiries aim to identify the semantics of such expressions.[3]

Putting it more broadly, one can identify reciprocal connections between the discussions on causation in philosophy and in linguistics. Philosophers, on the one hand, are often interested in the language of causal judgments and occasionally seek insights from the linguistic literature on certain expressions, and linguists, on the other hand, often borrow philosophers' analyses of causation, and assume that the relevant linguistic expressions denote such concepts. This paper explores various interfaces between the discussions in the two disciplines, and at the same time points to significant differences in their objects of investigation, in their methods and in their goals. Finally, it attempts to observe whether the disciplinary line is maintained, i.e. whether it might be the case that metaphysical questions are examined as linguistic ones and vice versa.

Considering first the object of investigation, most philosophers take it to be "the world" – as causal relations are between entities in the world. The metaphysics of causation, generally speaking, depicts the structure of the world itself, so that it will be one that hosts such causal relations (*inter alia* Hall & Paul 2013). Thus, a prominent question is what the *relata* are in a causal relation. Approaches differ

[1] Aristotle, in all likelihood, did not provide an account for *causality* in the sense that causation was analyzed in the philosophical literature since Hume. For Aristotle causes are whatever answers the question "why" and therefore his causes are various types of *because-answers* (see *inter alia* Hocutt 1974). For a somewhat parallel approach from recent literature, see Skow (2016).

[2] It is sufficient to mention examples from the last decade, such as Schaffer (2013: 49), Skow (2016: 26–27), and Hitchcock's contribution to this volume.

[3] An even more radical claim is that human knowledge of causality derives from "the linguistic representation and application of a host of causal concepts." (Anscombe 1981: 93; see also Psillos 2009).

with respect to the kinds of *things* the relata in causal relations (events, facts, tropes, attributes etc.) are.[4] Another central issue in philosophical accounts of causation, which has some bearing on various issues that will be discussed in this paper, is the question whether causation can be reduced to other more basic relations.[5] For some philosophers, each causal judgment has some suitable description in which it is an instantiation of some lawful regularity (Davidson 1967), or they argue that an account of causation must determine the logical dependencies between the participants in such relations, such as e.g. necessity and sufficiency (Mackie 1965), other types of dependencies such as counterfactuality (Lewis 1973a, b), probability (Kvart 2004), or by revealing the physical events that stand behind such claims (Dowe 2000).

In contrast, for linguists, the object of investigation is, for the most part, linguistic expressions, which we will henceforth refer to as *causative constructions* (to be defined below).[6] These span overt causative verbs such as *cause* but also *make, allow, enable, let*; connectives such as *because (of)*, *from*, *by, as a result of*; and change of state verbs such as *open, boil*, which may or may not include what are thought to be dedicated causative morphemes, and constructions involving affected participants. The specific concern in each of these types of constructions varies: whereas the goal of formulating the truth conditions of connectives and overt causative verbs is fairly straightforward, pinpointing a presumed causative component in change of state verbs is less trivial. With respect to these verbs, one central point is to understand the regularity of derivation between a stative-like expression and change of state verbs. The aim of such a discussion is to reveal the role of the causative meaning component in the derivation (Haspelmath 1993; Haspelmath et al. 2014; Doron 2003; Lundquist et al. 2016 among many others).[7,8]

[4]For Davidson (1969), for example, the individuation of events derives from their participation in causal relations.

[5]See, Woodward (2003) and Carroll (2009) for non-reductionist approaches to causation.

[6]Some linguists emphasize that causal expressions are not about actual causation in the world but rather, about how it is psychologically construed. For example, based on this assumption Levin and Rappaport Hovav (=LRH) propose a distinction between internal and external causation, which cannot be accounted for in terms of classical analyses of causation (see *inter alia* Levin & Rapaport Hovav 1994, 1995 *et seq.* and Rappaport Hovav's contribution to this volume). It is unclear, however, in a model-based approach to semantics, how the truth values of causative sentences are determined, according to those who claim that these types of judgments should not be evaluated against causal relations in the world.

[7]In certain languages, in pairs of inchoatives and causatives, the former are marked. These are cases, known in the literature as anticausatives (see in this book Alexiadou & Anagnostopoulou, Ahdout, Rappaport Hovav).

[8]Linguists' concerns in causation cover other levels of analyses besides the semantic one. One central topic, where the relevance of causation became significant is with respect to issues pertaining to argument realization mostly in dealing with the following two questions: A. Is causation *an* or *the* organizing factor in the grammatical relations of the basic predication (Croft 1991 *et seq*., see also Croft & Vigus this book)? B. Is it reflected in specific types of the predicates' arguments: whether there is a thematic role of CAUSER (e.g. Pesetsky 1995; Reinhart 2000; Doron

Importantly, also within linguistics, the issue of the *relata* comes up, and views on their nature diverge a great deal.[9] It is not always clear what the criteria are in linguistics for determining the nature of the relata, and, in fact, different approaches derive from different motivations: some linguists motivate their choice by referring to a philosophical conceptual analysis of causation (see Pylkkänen 2008, or the contribution of Levin this volume). Others, especially those who take individuals to be part of the causal relation, point to linguistic manifestations of causal judgments, where more often than not nominal expressions (NPs/DPs) are the participants in the actual linguistic expressions (see Doron 1999 and this volume; Reinhart 2000, 2002; Neeleman & van de Koot 2012).[10] This approach, very often, comes with a claim that linguistic causative expressions do not correlate with the way causal relations are perceived from a philosophical perspective.

Crucially, a non-trivial assumption underlying the question of the relata in the philosophical discussion is the issue of it embodying a binary relation between *cause* and *effect*. Philosophers committed to the framework of the *Structural Equation Model* (such as Pearl 2000; Yablo 2004; Woodward 2003 and Hitchcock this volume) do not take the binary relation to hold metaphysically; Hitchcock goes on to claim that the binary relation pertains to or stems from linguistically influenced causal judgments. In the rest of the paper, we will not refer to this framework directly, since much of the existent linguistic literature does not incorporate insights stemming form it.[11,12]

In contrast, within linguistics, various scholars argue that, while conceptually, causation involves a binary relation, it is not necessary for the linguistic expression

this volume); or whether there is, at the syntactic level, a designated functional head of CAUSE (see discussions by Ahdout and Alexiadou & Anagnostopoulou this volume).

[9] In a superficial way, it is possible to mention the following options:

Cause	Effect
Proposition	Proposition (Dowty 1979)
Event	Event (Pylkkänen 2008)
Individual	Proposition (McCawley 1976)
Individual	Event (Doron 2003; Neeleman & van de Koot 2012; Reinhart 2000; Pesetsky 1995)
Individual	Individual (Talmy 1976; Croft 1991)

[10] Since Dowty (1979), it is acknowledged that there is a discrepancy between the grammatical realization of the causer as a nominal phrase and the semantic facet. Accordingly, the individual syntactically realized is seen as part of a causing event (see Croft & Vigus this volume)

[11] For recent linguistic work building on this framework consider *inter alia* Bjorndahl & Snider (2015), Baglini & Francez (2016), Lauer & Nadathur (2020) and Baglini & Bar-Asher Siegal (forthcoming).

[12] As noted by Hitchcock (this volume), one can identify the inspiration for the SEM approach already in Mill's observation that causality is always held between a set of conditions and an effect. In this respect we will also be engaged in the current paper with this approach in the discussion in Sect. 1.4 regarding *Causal Selection*. Another reason for not engaging with this approach is that it is not a trivial matter what the principles are in constructing the relevant models (see *inter alia* Halpern & Pearl 2005a, b; Hall & Paul 2013).

to represent the cause.[13] At the same time, issue is taken with cases where there seem to be more than two parts to the relation.[14]

With this background in place, this paper critically traces points of interaction between the two disciplines, focusing on ways in which philosophical ideas were brought to bear on linguistic work. At the same time, we seek to expand our understanding of what in the philosophical discussion pertains to the linguistic realm (in line with Hitchcock's & Statham's papers, in this volume).

We will illustrate this type of inquiry by exploring several facets of the interpretative properties of linguistic constructions, some overtly encoding causation via the verb *cause* and its kin, or the connective *because*, others covertly – such as lexical causative verbs (change of state verbs, and caused activity verbs) or Affected Participant constructions. In order to have a common denominator for the discussion, we take linguistic Causative Constructions to be divided into three parts:[15]

(i) a cause (c);
(ii) the effect of the cause (e); and
(iii) the dependency (D) between c and e

(1) [c] D [e]

Using this working definition, we examine the nature of the relation in (1) in various constructions, by answering the questions that will be laid out in the next section. It must be emphasized that "cause" (c) and "effect" (e) are used here loosely in a pre-theoretical manner. Accordingly, the use of the term "causative" or the division of the components to "cause" and "effect" neither indicates an assumption that a construction denotes causal relations, nor does it commit to the nature of (c) and (e). In fact, it is quite the opposite: we will use (c), (e) and D, in an uncommitted manner, as it is our goal to understand their nature. We would like to examine to what extent the nature of (c) and (e) is similar to what philosophers think about the relata of the causal relation, and whether the philosophical accounts for causality can provide better insights as to the nature of the D in these constructions.

[13] It was argued that there is a set of intransitive verbs, designated anticausative verbs, that denote an event affecting its subject, without a syntactic representation of the cause (Alexiadou et al. 2006, and subsequent work; see also early work by Levin & Rappaport Hovav 1995 for similar ideas).

[14] This is particularly relevant for the analysis of psychological predicates and the distinction between cause and Target/Subject Matter (Pesetsky 1995; Doron this volume, among others); but also cases where agents and instruments appear together and bring about the effect (these cases are extensively discussed by Croft 1991, also Croft & Vigus, this volume).

[15] Cf. Bellingham et al. in this volume, who also compare between causative constructions. They propose, however, a different approach as to what should be considered as a *causative construction*, without holding received semantic preconceptions.

In Sect. 1.2, we lay out the questions to be explored in the subsequent sections of this paper; to anticipate, these questions seek to identify philosophical concepts relevant for the linguistic analysis, the way they should be defined truth conditionally, and to see whether all causative constructions underlie one and the same causative concept. In turn, we also explore what in the philosophical metaphysical inquiry pertains to the linguistic one. In the second part of the section, we provide a general survey of the various causative constructions to be analyzed in the paper. Then, in Sects 1.3, 1.4 and 1.5, we move to consider specific interpretative components of D relating c & e. The focus of Sect. 1.3 is counterfactuality, central to the philosophical discussion, also prevalent in linguistic treatments. In Sect. 1.4, we put to the test the question of *Causal Selection* in linguistic constructions, and compare how the various linguistic constructions pattern in this respect, observing that besides counterfactuality, D in each type of construction has different properties in singling out, or not, *The Cause*. Sect. 1.5 takes issue with negation, and through this further examines the semantic properties of D and the relata: whether D is asserted or not (1.5.1), and whether the relata (c) and (e) can be independently negated, opening a discussion on whether the relata are event-like or individual-like (Sects. 1.5.2, 1.5.3 and 1.5.3.1). Finally, Sect. 1.6 applies insights from the previous sections to an additional causative construction – the Affected Participant construction, where causation is not overtly encoded by any particular linguistic material. Sect. 1.7 concludes the discussion.

1.2 Setting the Scene

1.2.1 Theoretical Questions and Their Background

As we explore the flow of ideas about causation between philosophy and linguistics, we will focus on the following set of broad questions:

A. Can philosophical accounts of causation be relevant for linguistic analyses of causal constructions? Taking a semantic point of view, we ask whether such accounts can be "translated" to truth-conditions examining whether they provide the accurate truth conditions to these expressions. From a syntactic point of view, one may ask whether metaphysical accounts should put constraints on the syntactic analysis of the relevant constructions, for example, by determining the categorical nature of the relata.
B. Is there one all-encompassing causative meaning component underlying the diverse linguistic phenomena, regardless of whether the marker of the causal dependency is overt (e.g. *cause*, *because*) or covert (such as in lexical causative verbs); or should there be different ones for the various constructions, possibly correlating with the type of linguistic form?

C. As for the philosophical discussions on causation, we inquire whether they are sensitive to the linguistic data they rely on; or whether the disciplinary borderline between metaphysical questions and semantic ones is blurred.

A consequence of answering A positively often leads to answering Question B by claiming, or at least assuming, that there is only one type of causative meaning component for the diverse linguistic phenomena. Dowty (1979) is a good example of an influential linguist who followed this path, as he adopted Lewis' (1973a, b *et seq*.) analysis of causation, and consequently took it almost for granted that counterfactuality underlies the semantics of the various causal constructions. In contrast, many linguists observe a strict disciplinary borderline, and assume that although the concept of a causal relation is indeed relevant for the linguistic analysis, its particular semantic nature can remain opaque. Accordingly, the component CAUSE, either in the syntax or in the morphology, is taken to be an unanalyzable semantic primitive (e.g. Morgan 1969; Lakoff 1970; Jackendoff 1972: 39; Levin & Rappaport Hovav 1995 *et seq*.; Pylkkänen 2008). Yet a different approach is represented by such scholars as Talmy (2000) and Marantz (2005), who argue, in the context of verbs, each within a different framework, that causation is not part of their lexical properties, or that other concepts are more relevant (see also Neeleman & van de Koot 2012).

In the discussion bellow, we follow those who advocate semantic analyses that are informed by the philosophical literature, and assume that Question A is answered positively.

To set the stage, we turn now to introduce, in a somewhat simplified manner, two prominent approaches to causal relations: the *dependency* account and the *production* account (for a philosophical introduction of the two approaches to causation see Dowe 2000, and also Copley & Wolff 2014 for application in linguistics and psychology). According to the former, a basic conception of causation was to perceive Cause and Effect as related according to the following (from the 70s to now: Shibatani 1976b and see also Comrie 1981; Dixon 2000; Talmy 2000; Escamilla 2012):[16]

(a) Dependency between events – the causal relation is held between two events.
(b) Temporal precedence – the cause must precede effect.[17,18]
(c) Counterfactuality – the dependency is defined in the following way: "had the cause not occurred, the effect would not have occurred either."

[16]Cf. Neeleman & van de Koot (2012) who argue that although this is indeed the conceptual representation of causal relations, languages do not encode such a relation. It is unclear, however, how their alternative concept of Crucial Contributing Factor (CCF) can be established without recourse to some notion of causation. See also Martin (this volume) for the possibility that languages syntactically represent causal relations in different ways.

[17]For Lewis (1979) the temporal asymmetry of causal dependence derives from his counterfactual analysis in terms of closeness between possible worlds (cf. Anscombe 1981).

[18]The assumption that the cause must precede the effect goes back to Hume (A Treatise of Human Nature, §1.3.14).

This understanding of causation, to a large extent, follows Lewis' (1973a, b) counterfactual theory of causation (see Sect. 1.3), and was adopted whole-sale from philosophers without engaging in a fundamental discussion (but see Dowty 1979: 106–109 and Eckardt 2000).

The latter way to conceptualize causation assumes that some quality of the cause produces the effect. This approach emphasizes the intuition that the cause *brings about* the effect. While, since Hume, there is skepticism about theories of production as they seem to entail an unanalyzable causal primitive, various philosophers, linguists and psychologists developed such theories, according to which causation conceptually derives from people's representations of transfer of force and spatial relations. Within linguistics, this approach can be traced back to Talmy's (1976, 2000) work as well as to Croft's (1991 *et seq.*), see also the representation of this approach in this volume in the following papers: Bellingham et al., Croft and Vigus and Hagmayer and Engelmann. Causation, accordingly, is viewed from a conceptual or cognitive perspective, where the purpose in the linguistic literature is to understand how it is reflected in the grammar, or serves as an organizational mechanism for argument realization (for more recent literature see Wolff 2007; Copley & Harley 2015; Copley et al. 2015 and Wolff & Thorstand 2016).[19]

This paper, for the most part, examines different aspects of the dependency approach, with occasional notes to the literature from the production approach, when it will be directly relevant for the examined topics. The main reason for this choice is that the three respects in which causation is examined in this paper – counterfactuality, causal selection and negation of causation – are more easily applicable within the dependency approach, than in the force-dynamic one.

Question B, regarding the unitary concept, is quite complex. Indeed, in the history of the linguistic literature, one can repeatedly identify the underlying assumption of a unitary analysis, just to mention a few examples: An early stab on the question of causation in linguistics was provided in the framework of Generative Semantics. In this framework, an attempt was made to claim that underlyingly the semantic primitive CAUSE and the overt verb *cause* are in fact one and the same thing. They have the same entailed propositions and the same conditions of temporality, dependency and counterfactuality hold for both (see also van Valin 2005: 38). Syntactically, evidence was adduced in favor of event decomposition (McCawley 1968 and Morgan 1969). Similarly, when Pesetsky (1995) introduced CAUSER as a thematic role, he assumed that its underlying syntax is identical to that of the overt preposition *because of*; Alexiadou et al.'s (2006, and later work) propose a similar structure to verbs with a NP/DP causer as their subject and the participant with preposition *from.* In a different context, recently, Copley et al.

[19] Within the same line of thought, various philosophers provide accounts for causation that do not reduce causation to some dependency defined merely by logical relations. Among those there are production accounts (Hall 2004), which aims to capture the notion of "bringing about" affiliated with causation, and causal processes which focus on the role of physical processes as those that define causal relations (Salmon 1997; Dowe 2000).

(2015) attempt to provide a unified analysis of verbs and connectives through force-dynamic theories.

As noted earlier, one can identify this assumption concerning the unitary analysis for causal relation as an inheritance from the philosophical tradition. Recently, however, philosophers proposed various theories of causal pluralism (Hitchcock 2003; Hall 2004; Psillos 2009). Similarly, within cognitive studies, Waldmann & Hagmayer (2013), *inter alia*, indicate that people have a pluralistic conception of causation, and different judgments rely on different types of concept of causal relations. Traces of this tendency can be observed also in recent linguistic studies. Copley & Wolff (2014) suggest that different types of causative constructions should be analyzed in light of different approaches to causation (e.g. causal connectives are best captured as a dependency, whereas the semantics of causal verbs is best captured in the framework of production based theories). Similarly, Lauer (2010), Martin (2018), Bar-Asher Siegal & Boneh (2019) and Nadathur & Lauer (2020) argue that the semantic content of D is different in various constructions, tracing whether the main verb encodes a necessary and/or a sufficient condition.

Finally, we wish to conclude this section with an example for how philosophical analyses can fruitfully inform linguistic ones. We, pre-theoretically, characterized causative constructions by the D that stands between (c) and (e). However, linguists do not always distinguish between causation and other types of dependencies, such as grounding,[20] logical dependence, teleology[21] or reasoning, which are kept distinct in philosophy. Nevertheless, several studies did point out that not all causative constructions are dedicated to the expression of just and only causal relations. For example, connectives as well as the verb *cause* give rise to situations where temporal precedence and counterfactuality do not simultaneously hold with dependency:[22]

[20] For an introduction of the notion of grounding see Correia & Schneider (2012). Schaffer (2016: 96) lists the following differences between causation and grounding:

- causation can be non-deterministic, grounding must be deterministic;
- causation can only connect distinct (grounding-disconnected) portions of reality; and
- causation can be non-well-founded, grounding must be well-founded.

[21] In discussions on the philosophy of action, for various philosophers, such as Davidson (1963, and more broadly in 1980), teleological explanations are themselves analyzable as causal explanations. Others, such as Taylor (1964), argue that they should be analyzed in non-causal terms.

[22] Another use of *because* is when it is used to indicate the source of the speaker's knowledge, as in sentences like *They are getting married, because I saw an engagement ring on her finger*. We wish to thank Larry Horn for mentioning this type of *because*; we do not refer to such cases as they may involve a different kind of causal relations. Cf. Charnavel (this volume and related work) on similar uses of *since*.

(2) a. A kangaroo is a marsupial because it has a pouch. (Dowty 1979: 132b)
b. Mary's living nearby causes John to prefer this neighborhood. (Dowty 1979: 132c)
c. The floor is black because of the ants that might infest it. (adopted from Maienborn & Herdtfelder 2015)

This paper proposes a preliminary study that attempts to critically consider points of meeting between the discussions in philosophy and linguistics, and also where they part ways. We will do so by exploring differences between various causative constructions, as we propose a preliminary semantic characterization of some of them. Throughout Sects. 1.3, 1.4, 1.5 and 1.6 we will explore differences in the semantics of various causative constructions, and examine the source for these differences. More specifically, we will ask whether the differences in the semantics indicate that the various constructions encode different causal concepts (cf. Thomason 2014) or whether they can be accounted in other ways such as different syntactic structures.

The questions evoked in C are general in their nature, and require a vast and careful investigation. In the paper, we will refer to C mainly in Sect. 1.4, and also in the concluding discussion.

The next section introduces several types of causative constructions that we then compare in the subsequent Sects. 1.3, 1.4 and 1.5.

1.2.2 Causative Constructions

We center on three central types of causative constructions in English and Hebrew. Hebrew is useful as it enables to widen the discussion of lexical causatives (Sect. 1.2.2.3), with its overt morphology absent in English. Our categorization is classified according to a basic syntactic characterization, and it is purely for presentational purposes (for typologies of cross-linguistic causative constructions see Shibatani 1976a; Comrie 1981: 158–177; Song 1996; Dixon 2000, among others). In Sect. 1.6, we add another construction to the discussion: the Affected Participant construction, available both in Hebrew and in English. This will enable us to examine further the semantic properties of causal constructions in the absence of an overt D.

1.2.2.1 Overt Causative Verbs

Under this category fall verbs such as *cause, make, enable, allow, let*, that seemingly express causal relations, where the subject is the cause and the complement of the verb is the effect.

(3) a. [$_c$ The neighbor/the music] **caused / made / enabled** [$_e$ the kids (to) dance].

b. [$_c$ ha-šxena/ha-musika] **garma / ifšera** [$_e$ la-yeladim lirkod].
The-neighbor/the-music made / let the children dance

Such overt verbs are used most often in philosophical discussions about causal relations, assuming that they are true in a given circumstance only when (c) is the cause of (e) (*inter alia* Anscombe 1981; Hitchcock & Knobe 2009; Schaffer 2013, also Statham this volume).

A few linguistic analyses of these verbs, focusing mostly on the verb *cause*, provide a semantic analysis of a counterfactual dependency (*inter alia* Abbott 1974; Eckardt 2000; Lauer 2010). Others have noted on the role of causation in the meaning of other verbs, such as implicative verbs (Nadathur 2015; Baglini & Francez 2016). Recent accounts of such verbs, assuming semantic analyses of causation as forces, argue for two interacting forces or tendencies. They propose that verbs vary with respect to whether the force is associated with the agent, as is the case with the verb *cause*, or with the patient, as is the case with the verb *enable* (Talmy 2000; Wolff & Song 2003; Wolff 2007; Copley et al. 2015). They take the availability of such distinctions to be a theoretical advantage for a force-dynamics analysis of causation. It seems necessary, however, to examine whether these are indeed differences in the semantics of the verbs, or whether the differences between the semantics of these verbs should be relegated to a variety of pragmatic implications associated with them.[23] The focus in this paper is mostly on the verbs *cause* in English, and its Hebrew rough equivalent *garam.*

1.2.2.2 Connectives

Connectives are conjunctions such as *because, since*, *for*; and prepositions such as *because (of), from*-PPs, *by*-PPs. Some of them come as complex nominal expressions, such as *as a result of, out of,* added as adjuncts introducing the cause to a main clause, expressing the effect. Whereas the latter two introduce a nominal expression, *because* and *since* can also connect two clauses. These elements have been studied from various perspectives (*inter alia* Alexiadou et al. 2006; Charnavel

[23] According to Wolff (2003), ENABLE is associated with the tendency of the patient for the result and with lack of opposition between the effector and the patient, while this tendency is absent in the case of CAUSE, as there is an inherent opposition between the effector and the patient. Such a dichotomy must assume that these two verbs are in a complementary distribution, and therefore cannot describe the same state-of-affairs. However, it seems to be the case that often the distinction is merely with respect to the way speakers favor the result. Thus, one can imagine the following two sentences describing the same situation, (i) by supporter of the strike and (ii) by its opponent:

(i) The decision of the party enabled the strike.
(ii) The decision of the party caused the strike.

2018 *et seq.* and this volume; Copley et al. 2015; Degand 2000; Johnston 1994; Kadmon & Landman 1993: 389–398; Maienborn & Hertfelder 2015, 2017; Solstad 2010; Sweetser 1990).

(4) a. [$_e$ The kids danced] **because of** [$_c$ the music].
b. [$_e$ The door opened] **because of / from** [$_c$ the wind].
c. [$_e$ She lost this case] **because of** [$_c$ the witness' death].
d. [$_e$ She died] **from** [$_c$ drinking too much water].
e. [$_e$ The kids danced] **because** [$_c$ they were happy].
f. [$_e$ You are biting your thumb at me] **because** [$_c$ you want to insult me] (Davidson 1963: 688).

(5) a. [$_e$ ha-delet niftexa] **biglal /** **me-** [$_c$ ha-ruax].
The-door opened because / from the-wind
b. [$_e$ hi meta] **biglal /** **me-** [$_c$ štiyat mayim].
She died because / from drinking water

The conjunction *because*, as noted earlier, can also indicate reasoning, as is the case in (4f). An explanation of an intentional action in terms of its motives and reasons is different from expressing a causal relation. Together with what has been exemplified in (2), clearly the connective *because* does not denote a causal relation *stricto sensu*. Indeed, various philosophers have noted that *because* is the preliminary way to convey grounding dependencies (see Schneider 2011; Correia & Schnieder 2012: 22–24, Schaffer 2016: 84, Skow 2016).[24] However, the linguistic literature often includes it among the causal expressions and analyzes it as such (see, for example, Charnavel this volume and related work). Nevertheless, the preposition *from* has been often taken to be the ultimate linguistic means to introduce the cause in a relation between entities (Alexiadou et al. 2006, 2015; also this volume; Ahdout this volume). Presumably, this is related to the more restricted distribution of *from*-PPs, in comparison to the connective *because*, being mainly attested with verbs lacking an agentive or causative external argument such as unaccusatives and statives.

Differences in meaning between the two connectives have been discussed by linguists (Maienborn & Herdtfelder 2015, 2017), and are nicely revealed by the asymmetry in the inference relations they give rise to, as demonstrated in (6):

(6) a. Maria is tired from the trip. ⇒ Maria is tired because of the trip.
b. Maria is tired because of the trip. ⇏ Maria is tired from the trip.

[24]It is worth noting that Aristotle's so-called four causes belong to various notions of reasoning and explanation, and it has been noted that in fact he spoke about four *because*s (see Vlastos 1969: 293ff.)

While with the connective *because* the tiredness of Maria can be related to a trip she helped her partner prepare for, with *from* she must have participated in the actual trip. These inference patterns are extendable to other languages as well.

A semantic analysis should account for these differences, and others to be discussed throughout this paper. In light of question B, it is reasonable to entertain the possibility that these differences have a bearing on the question of the unitary concept of causal relations expressed by linguistic causative constructions, namely on the nature of D in the various constructions. This issue will be systematically considered in Sects. 1.3, 1.4 and 1.5.

1.2.2.3 Lexical Causatives

This category consists in constructions with verbal predicates, in which the subject is perceived as (part of) the cause responsible for bringing about the state-of-affairs denoted by the VP, which in turn is conceived as the effect.

This type of constructions primarily features change of state verbs such as *open, kill, boil* (Jackendoff 1972; Croft 1991; Rappaport Hovav & Levin 1991 *et seq*. among many others), together with change of location verbs and ditransitive verbs: *put, send* (e.g. Gropen et al. 1989; Beavers 2011). Another relevant type of constructions is resultatives such as *hammer the metal flat* in English (extensively discussed by Levin & Rappaport Hovav 1991 *et seq*.; Bittner 1998; Kratzer 2005 and Levin this volume). This latter sub-group will not be taken up here.

Alongside verbs of change of state (7), we will consider also caused activity verbs (8). Caused activity verbs are attested, to a limited degree, in English as well (cf. Cruse 1972 for a brief discussion),[25] but in this context, Modern Hebrew adds another dimension with its so-called causative templatic morphology (see Doron this volume), where a root can appear in a pair of templates, one of which increases valency by adding a participant that may be conceived as CAUSE or implicated in the CAUSE (***rakad*** 'dance' vs. *hi**rkid*** 'make.dance').[26]

(7) a. [$_c$ John / the wind / the key] [$_e$ opened the door].

b. [$_c$ ha-šaxen / ha-ruax / ha-mafteax] [$_e$ patax et ha-delet].
The-neighbor / the-wind / the-key opened ACC the-door

[25] Here are the examples provided by Cruse 1972 (exx. 4–7) for caused activity verbs:

(i) John galloped the horse around the field.
(ii) John flew the falcon.
(iii) John worked the men hard.
(iv) John marched the prisoners.

[26] In this paper we set aside causation involving psychological predicates (Dowty 1979; Belletti & Rizzi 1988; Pesetsky 1995; Arad 1999; Doron 2012, this volume; Ahdout 2016; Gaulan 2016; Alexiadou and Anagnostopoulou this volume and related work).

(8) a. John (#the music) danced the kids to the other side of the room.
b. [$_{c}$ ha-šxena / ha-musika] [$_{e}$ hirkida et ha-yeladim].
the-neighbor.F / the-music dance.CAUSE ACC the-kids

As will become clear in the following sections, change of state verbs and caused activity verbs should be analyzed separately, and we will examine in what sense the addition of CAUSE entails a causal relation in each. As was clarified in the introduction, we use the denotation (c) in an uncommitted manner. Similarly, in the glosses, the templatic morpheme CAUSE indicates an operation on the verb's valency which is associated with the addition of (c). In fact, the morphological and syntactic literature contains numerous discussions of whether there are morphemes or syntactic heads whose role is to introduce a CAUSE(R), (c) in our terms, whereas the piece of structure below it in the syntactic tree constitutes (e).

Here and in the next sections, our goal is to have a better understanding of the nature of D, also when it is covertly expressed. Analogously to connectives, it has been noted that assertions of sentences with change of state verbs entail the truth of an equivalent sentence with the overt causative *cause* (9a), but an entailment in the other direction does not necessarily hold (9b):

(9) a. John broke the window. ⇒ John caused the breaking of the window.
b. John caused the breaking of the window. ⇏ John broke the window.

This asymmetry was accounted for by the observation that lexical change of state causative verbs, unlike overt verbs, have an additional constraint of a direct causal link between (c) and (e).[27] This additional requirement can be the reason for the contrast between the constructions, as demonstrated in (10a) and (10b) (Fodor 1970; Katz 1970; Ruwet 1972; Shibatani 1976b; Levin & Rappaport Hovav 1995):

(10) a. *Sue broke the glass on Sunday, by heating it on Saturday.
b. Sue caused the glass to break on Sunday, by heating it on Saturday.

Several studies have recently shown that this dichotomy is not as strict as it was believed to be, and in certain contexts lexical causation expresses indirect causation as well (Bittner 1998; Danlos 2001; Neeleman & van de Koot 2012). How to capture this additional requirement that creates the direct causation effect and whether it is semantically or pragmatically encoded is an ongoing discussion (for a recent survey and a novel account see Baglini & Bar-Asher Siegal forthcoming).

Moreover, change of state verbs occasionally describe state of affairs with zero-change (or failed-attempt), especially with agent subjects. It has been observed that in some languages this is a more widespread phenomenon than in others (Martin 2015, *et seq.* and see the review of the literature on this in Martin's contribution to this volume).

[27] For a survey of the various characterisations for direct causation in the literature see Wolff (2003). Typological studies often seek correlations between the type of the construction and the level of directness of the causation (see Nedjalkov & Silnitsky 1973; Dixon 2000; Shibatani & Pardeshi 2002; see also Levin's contribution this volume).

(11) John taught Mary how to iron sheets, but despite of the fact that she watched him do it, she still doesn't know how to. (adapted from Oehrle 1976)

Finally, lexical causative verbs, which realize their external argument as the causer, have fueled a debate within linguistics as to the nature of the relata. At this preliminary stage, we abstract away from the issue of whether the cause is an individual, an event or a proposition, namely whether the causer must be conceived as a "representative" of some underlying event or proposition at the level of the semantic analysis of the causal relation (Fodor 1970; McCawley 1976; Dowty 1979; Levin & Rappaport Hovav 1991 *et seq*.; Reinhart 2000, 2002; Doron 2003, this volume; Pylkkänen 2008; Neeleman & van de Koot 2012). We return to this in Sect. 1.5.3.1.

In the next three subsections we turn to directly tackle the questions presented in Sect. 1.2.1, by observing how selected meaning components in D are manifested in the three causative constructions introduced in this section.

1.3 Counterfactuality

In what is probably the most famous comment on causal relations, Hume proposed the following definition for causation:

> We may define a cause to be an object, followed by another, and where all the objects similar to the first are followed by objects similar to the second. Or in other words where, if the first object had not been, the second never had existed (*An Enquiry Concerning Human Understanding*, Of the Idea of Necessary Connexion, Part II).

Much attention was paid to the fact the Hume proposed here two different definitions, and to why he believed them to be two formulations of the same one ("or in other words"). Since Lewis (1973a, b), the second, *counterfactual*, definition "if the first object had not been", became the central component in the conceptualizing of the causal dependency.[28] It was taken to define the dependency relation between (c) and (e) when the former is a cause of the latter. In other words, in such cases it can be stated that (e) could not have occurred without (c) – *causa sine qua non*.

Despite several known problems, such as cases of transitivity and preemption, counterfactuality still stands as a major component of most contemporary dependency approaches (see for instance Hall 2004; Kment this volume). This definition was well established for centuries, and Lewis' (1973a, b) main contribution is the proposal to conceptualize counterfactuality with possible worlds, and the relation of comparative similarity between them (cf. Von Wright 1968: 43–45).

[28] While for Lewis, causation should be reduced to counterfactual terms, there is a strong philosophical and linguistic opinion that the relation holds in the opposite direction, as causal notions should figure in a semantic account of counterfactuals (see *inter alia* Veltman 2005; Schulz 2011; Bjorndahl & Snider 2015 and Kment this volume).

As observed earlier, semantic analyses for causative constructions often take for granted that counterfactuality is a component in their meaning. This is probably the most prevalent influence of the philosophical literature on formal studies of these constructions. It is, therefore, only natural to begin our semantic journey in examining whether counterfactuality indeed emerges as a meaning component in causative constructions.

Phrasing this formally, when we mark the various construction as p^{cDe}, we ask the following questions with respect to each one of them:

(12) a. When the relevant p^{cDe} is true, is the counterfactual claim necessarily true?
D^c: $p^{cDe} \Rightarrow (\sim c \,\Box\!\!\rightarrow \sim e)$
b. Does counterfactuality exhaust the semantic content of D**?**

This section will be dedicated to question (12a), and subsequent sections will take issue with answering various aspects of (12b).

Consider first the connective *because.* Causal statements with *because* do not necessarily convey counterfactuality, as in example (13a), where (e) is negated.

(13) a. I did not go to France **because** of the rain / **because** it rained. $\not\Rightarrow$
b. Had it not rained I would have gone to France.

In a situation where the speaker chose a destination for her vacation among a list of cities, she can state (13a) as a reason for removing France from the list. In such a scenario, (13a) does not entail (13b) as it is not the case that had it not rained, the speaker would have gone to France, she may have not gone to France anyhow, as her final choice was independently motivated. It must be noted, that (13a) can be stated also in cases where there is a counterfactual relation (i.e., that if there was no rain the speaker would have gone to France). The point here is that counterfactuality is not necessarily entailed by the use of this connective, but it can be. We return to this point in Sect. 1.5.3.2.

Because differs radically from overt causatives in this respect, where counterfactuality necessarily holds with the verb *cause*.[29]

(14) a. The rain caused him not to go to France. $\Rightarrow$
b. Had it not been raining she would have gone to France.

The causing part of overt causative verb, is a necessary condition,[30] and counterfactuality holds for the effect (cf. Eckardt 2000). Here are additional examples:

(15) a. The heat caused me to open the door. $\Rightarrow$
b. If it weren't hot, I would not have opened the door.

[29] Nadathur & Lauer (2020), argue that the verb *make* is preferred in cases of preemption (in which counterfactuality does not hold). It is beyond the scope of this paper to discuss the validity of their proposal (see Baglini & Bar-Asher Siegal Forthcoming)

[30] But it doesn't have to be a sufficient condition (Lauer 2010; Nadathur & Lauer 2020).

(16) a. The recession caused Jerry to lose his home. ⇒
b. (Other things being equal,) if the recession had not happened, Jerry would not have lost his home. (Lauer 2010: ex. 10)

Interestingly, there is no correlation between the grammatical category of the construction and whether it has counterfactuality as a component of the D it encodes. Namely, it is not a verb *vs*. connective distinction, since *from*-PPs contrast with *because of*. Consider examples (17)–(18), where (e) is negated.

(17) She is not functioning from stress.

(18)

hi	lo	metafked-et	me-ha-laxac
She	NEG	function-F.SG	from-the-stress

Here, contrary to example (13) above, (17)–(18) indeed entail that had she not been under stress, she would have been functioning.

This lack of correlation can also be demonstrated in the realm of lexical causative verbs: as they seem to pattern differently in this respect, according to whether they encode a caused change of state or a caused activity. In the case of change of state verbs, counterfactuality obtains (Von Wright 1968: 43–45; Dowty 1979):

(19) a. The baby opened the door. His mom pushed his hand over the button that opens the door. ⇒
b. Had the baby not pushed the button, the door would not have opened.

This entailment arises when we compare the state of affairs in the actual world to a very similar world differing only by the fact that the mother did not push the baby's hand; it definitely does not entail that the mother would have not sought for other ways to open the door, or in the case of (14), for example, that there could not have been other motivations to go to France.

In contrast, counterfactuality does not necessarily hold when verbs express a caused activity, even with a close similarity between worlds. Consider example (20):

(20)

ha-zamar	hirkid	et ha-yeladim.
The-singer	dance.CAUSE	ACC the-kids

≈'The singer made the kids dance.'

(20) can very well be uttered in a context where the kids started to dance prior to the singing, and may imply various additional contextual meanings such as the singer adding motivation, or intensity or the time of the actions. However, crucially, none of these additional meanings are entailed by the content of the verb itself, similarly to the connective *because*. The sentence in (20) therefore does not necessarily entail that "had it not been for the singer, the kids would have not danced", as (20) can be stated if they where dancing before. It must be noted that, here as well, (20) can be used in situations where counterfactuality is assumed to hold. Our point is that this is not necessary, see Sect. 1.5.3.2.

Similarly, in English, (21) can describe a situation in which counterfactuality does not obtain, specifically when the prisoners were marching in the prison's courtyard, and then John came and marched them some more by commanding them to do so.

(21) John marched the prisoners. (Cruse 1972: ex. 7)

Lexically, what sets the two subclasses of verbs apart is (i) their lexical aspectual properties: telic verbs encoding a result state, in the case of change of state causatives, and activity or process verbs, without an encoded result state (see Martin, Alexiadou & Anagnostopoulou this volume; see also Neeleman & van de Koot 2012, Levin & Rappaport Hovav 1991), and (ii) animacy of the direct object, namely in the case of caused activity verbs, the direct object/causee is agent-like (see Nash this volume, cf. Nadathur & Lauer 2020). The latter property has to do with the possibility for a *causa sine qua non* to hold when volitionality is implicated. For an elaboration on this contrast see Bar-Asher Siegal & Boneh (2019).

To summarize, the answer to question (12a) is that not all causative constructions entail counterfactual dependencies between their (c) and (e). Sentences of both the connective *because* and caused activity verbs, can be true even when their relation cannot be paraphrased in counterfactual terms, although they often involve such a relation. For discussion, see Sect. 1.5.3.2 (Table 1.1).

In terms of the broad goals of the paper, this section already makes clear that not all causative constructions pattern alike, and that the presence or absence of the counterfactual entailment cannot be correlated with a particular linguistic form or type of marking. It also clarifies that the meaning components inherited from philosophical analyses for causal relations, should be scrutinized more closely by linguists, rather than automatically assuming their viability for semantic analyses of causative constructions.

As for the question in (12b), whether counterfactuality exhausts the semantic content of D, when we recall the differences between connectives exemplified in Section (2.2.2), as well as the asymmetric entailment relation between lexical causatives and overt causative *cause* - the former exhibiting an additional requirement of direct causation - evidently counterfactuality does not exhaust the content of D.

Armed with these observations, we extend further the investigation of question B, and turn in the next section to examine the relevance of various philosophical accounts of *Causal Selection* to the semantics of the causative constructions. We examine what type of cause is (c), or alternatively, how D is construed such that it

Table 1.1 Counterfactuality in causal constructions

$\mathbf{D^c: p_{cause}}^{\mathbf{cDe}} \mathbf{\Rightarrow (\sim c \mathrel{\square\!\!\rightarrow} \sim e)}$
$\mathbf{D^c: p_{from}}^{\mathbf{cDe}} \mathbf{\Rightarrow (\sim c \mathrel{\square\!\!\rightarrow} \sim e)}$
$\mathbf{D^c: p_{change\text{-}of\text{-}state}}^{\mathbf{cDe}} \mathbf{\Rightarrow (\sim c \mathrel{\square\!\!\rightarrow} \sim e)}$
$D^c: p_{caused\text{-}activity}{}^{cDe} \not\Rightarrow (\sim c \mathrel{\square\!\!\rightarrow} \sim e)$
$D^c: p_{because}{}^{cDe} \not\Rightarrow (\sim c \mathrel{\square\!\!\rightarrow} \sim e)$

establishes the nature of the relation of (c) to (e). In so doing, Sect. 1.4 continues to focus on answering the question raised in (12b).

1.4 Singling out *the Cause*

When seeking to characterize the metaphysics associated with "the folk theory of causation", philosophers often rely on linguistic judgments. As we explore additional semantic differences between causative constructions, this section sets out to reflect on this methodology. It makes the point of considering whether some of the data of the philosophical observations could have been different, had they resorted to a different causative construction. The focus of this discussion, will revolve around the topic of *Causal Selection*, to be introduced hereafter.

In practice, a standard methodology in the philosophical literature is to describe a given scenario, and to ask, with respect to potential c(ause) and e(ffect), whether it is possible to assert that "c is the cause of e". Some discussions are careful to distinguish between this type of judgment, with a definite article, and its indefinite counterpart: "c is *a* cause of e". Lewis (1973a, b: 162), for example, emphasizes that his analysis of causation in terms of counterfactuality provides an account for *a cause* and not for *the cause*. Similarly, for Mackie (1965), an INUS (=Insufficient but Necessary/Non-redundant part of an Unnecessary but Sufficient) condition is the characterization of *a* cause.[31] The intuition behind the version of the causal judgment with the definite article aims to further capture *Causal Selection.*

Causal Selection consists in teasing apart *real* causes and *mere* background/enabling conditions. Taking as an illustration the classic case of a burned down house: while a house would not have caught fire if there were no oxygen in the relevant space, as well as some flammable material, in this toy example, only a discarded cigarette butt was *The Cause* of the fire.

Mill (1884, Volume I, Chapter 5, §3) introduced this distinction and it stood at the heart of numerous discussions of philosophers, historians and legal theorists, who tried to motivate the signaling of a condition as *The Cause* among various causal factors (Einhorn & Hogarth 1986; Hart & Honoré 1959; Hesslow 1983; 1984; Hilton 1990; Mackie 1965, 1974; White 1965; Cheng & Novick 1991, *inter alia*). These accounts made it clear that such selections cannot be motivated by characterizing the dependency between (c) and (e) in terms of necessity and sufficiency, as causes and conditions hold similar logical relationships to the effect. Therefore, the choices are accounted for via other types of criteria, such as the normality of the potential causal factors (for an overview, see the chapters of Statham & Hitchcock this volume), or based on conversational principles, given assumptions about the state of knowledge

[31] This is true for any account that emphasizes the intuition that causal relation is a transitive relation.

and interests of the seeker of a causal judgment (Beebee 2004: 296 and Hitchcock & Knobe 2009).

In light of the broader goals of this paper, we turn now to examine whether linguistic causative constructions, with their binary division into (c) and (e), are sensitive to select *The Cause*, and not mere background/enabling conditions or causal factors.[32]

Given this background, the current section has a twofold goal:

a. To examine whether the constructions under discussion involve the selection of *The Cause*.
b. To characterize the philosophical discussion on Causal Selection in linguistic terms.

The first issue delves on question (12b) in Sect. 1.3, as to whether counterfactuality exhausts the semantic content of D. The second targets question C presented at the outset of the paper. In demonstrating this, we will concentrate on the following issues:

First, we will use this discussion to clarify the semantic scope of the various constructions, and check whether they describe other types of dependencies besides causation (such as grounding, teleology and reasoning).

Second, *Causal Selection* involves a choice of *The Cause* among a set of conditions. From a linguistic point of view, when these analyses focus on selection among causes, they *de facto* aim to formulate the truth conditions of sentences of the form: "C is *the* cause of E". This is relevant regardless of what the right analysis of causation is, and which philosophical analysis captures best what lies behind people's intuitions to see a causal relation in the world. In light of this, in order to examine whether the semantics of a given causative construction involves a choice of a salient cause, it is sufficient to test whether the proposition in this construction entails an equivalent proposition, with the same (c) and (e), in the form of "C is the cause of E". This can be formally represented as follows:

(22) $p^{cDe} \Rightarrow$ "C is the cause of E"

The discussion hereafter demonstrates that only rarely is (c) of causative constructions also necessarily *The Cause*.

[32]Notably, previous semantic accounts, struggled with cases where these constructions are used, but when (c) is not *The Cause.* They considered such cases as empirical reasons to doubt the assumption that causative constructions encode causal relations (Abbott 1974; Dowty 1979; Eckardt 2000). However, it is possible that it is only an indication that these constructions do not involve the selection of *The Cause*.

1.4.1 Overt Causative Verbs

Consider first the following example with the overt verb *cause*, exemplifying that (22) fails to hold:

(23) **Context:** John left the door open, a gust of wind came in and shattered the window.
  a. John caused the window to shatter. $\not\Rightarrow$
  b. John is the cause of the shattering of the window.

Clearly (c) in (23a), John, is not necessarily what we will intuitively designate as *The Cause* of (e). Instead, given (23b), (c) is to be perceived as one of the conditions that brings about (e), with often an additional flavor of responsibility attributed to the selected cause - John.

A preliminary survey indicates that this account holds true of all the other overt causative verbs, albeit with varying semantic nuances for (c) (cf. Wolff 2007).

The possible identification of subjects of sentences with overt causative verbs as *The Cause* presents yet a more puzzling challenge. Let us consider a sentence like (24), taken from Eckardt (2000). Pat cooks spaghetti every day when he returns from work. On the specific evening described by (24), he cooked spaghetti late, rather than at the regular time, and the reason for the late hour of the cooking was a traffic jam.

(24) The traffic jam caused Pat's cooking spaghetti late.

Note that while the cause of Pat's cooking spaghetti is whatever set him off on this daily custom, the cause for his *late cooking* of spaghetti is the traffic jam. However, from a metaphysical point of view, and for theoretical linguistic considerations, a reasonable assumption is that the event of *cooking spaghetti* and the event of *cooking spaghetti late* are one and the same. The latter description of the event adds a qualification. It is, therefore, puzzling that the entailment, expressed in (24'), does not hold.

(24') a. The traffic jam caused Pat's cooking spaghetti late. $\not\Rightarrow$
  b. The traffic jam is the cause of Pat's cooking spaghetti, which was late.

These are cases known in the literature as containing fragile events (see Paul 2000 for an introduction of the topic in philosophical terms). In light of such cases, Eckardt (2000) proposes to distinguish between two different uses of the verb *cause*: Those which, in our terms, pass the test in (22), dubbed by her *real causal statements*, whereas those which fail are termed *pseudocausal statements*. The latter involve focus on a certain syntactic constituent. Thus, (24a) must be interpreted as: *the traffic jam is the cause of Pat's cooking spaghetti* ***late rather than on time***.

If we wish to avoid polysemy for the verb *cause*, we can follow the proposal that interpreting sentences with this verb always involves a contextual contrast (cf. Achinstein 1976; Dretske 1977; Woodward 2003; Maslen 2004; Schaffer 2005,

2016; Northcott 2008). Such proposals argue that contrast is part of what defines causal relations. One is left to wonder how contrasts constitute the metaphysical notion of causation, in the sense that this is a characteristic of causal relations in the world. Indeed, van Frassen (1980, Chapter 5) and others, as Woodward (1984), relate resorting to contrasts to *explanations* and not to causal relations in the world. van Frassen emphasizes the pragmatic factors in explanations, and stressing that contrasts are determined by context. However, as noted by Hitchcock (1996), the relationship between explanatory and causal claims are rather complicated, and it is not trivial in what sense contrasts can be relevant only for explanations and not for the causal claims themselves. This is, however, beyond the scope of the current paper.[33]

This leads us to consider the nature of the discussion concerning *Causal Selection.* If we take the test in (22) seriously, selection of a cause is reflected in the semantics of the sentence: "C is *the* cause of E". The semantics of the focused definite article, as noted by Eckardt, on the one hand, involves a choice of a salient condition, as *The Cause*, and on the other hand, it triggers the denial of the other conditions from being salient causes.[34] This is a well-established linguistic phenomenon and should be analyzed as such.

Beyond explaining the fact that sentences with the verb *cause* do not entail sentences with *The Cause*, the significance of these observations may lead to identifying a disciplinary confound, relevant for dealing with question C. The absence of inferences between causative constructions challenges the naïve methodology of how "the folk theory of causation" can be drawn from intuitions about causal judgments, since there are meanings that might be associated with a specific construction, and accordingly different "folk theories of causation" might be derived from different constructions. Therefore, if causative constructions vary with respect to their truth conditions, then intuitions about causal judgments differ from one constructions to

[33] We thank Arnon Levy for bringing up this issue.

[34] This discussion assumes that we agree with Eckardt (2000) that it is possible to distinguish between *causal-* and *pseudocausal statements*, and in our account only the former pass the test proposed in (22). The following, for example, is a *causal statement*:

(i) Dr. Spock's first aid caused Joe's heart to start beating again.

As it can be paraphrased:

(ii) Dr. Spock's first aid is the cause for Joe's heart to start beating again.

According to Eckardt, this is a causal statement, since it does not involve a denial of contextual alternatives under focus. However, since even in her analysis actual phonological focus is not required, it is possible to consider this sentence as also involving some denial of alternative/contrast, as is assumed by some philosophical accounts (Schaffer 2005, 2013):

(iii) Dr. Spock's first aid caused Joe's heart to start beating again, rather than not beating anymore.

Therefore, it is necessary to find some consistent way to distinguish between the two types of contrasts. This seems to be related to what determines the identity of events, an issue which is beyond the scope of this paper. In the context of comparing between the linguistic and the philosophical literature, it is interesting to note on the similarity between van Frassen's (1980) discussion on the contrast-class, as a set of alternatives, and the work of Rooth (1992) regarding the semantics of focal elements and the role of the contextual alternatives in their interpretations.

another, and thereby they do not necessarily reflect the conception of causation *per se*, rather indicate the meaning of the specific types of constructions.

1.4.2 Connectives

As noted already in Sect. 1.2.2.2, unlike overt causative verbs, some connectives can convey propositions that do not indicate causation at all, as in (25):

(25) Fractions are not even numbers or odd numbers, because they are not whole numbers.

There is no temporal ordering possible between the two relata, since (25) states a mathematical explanation. Thus clearly, such a construction does not necessarily involve the selection of *The cause*. The question is, therefore, when it does express causal relation, whether it slelcts such a salient cause. For this purpose, we examine the application of the test proposed in (22). As a matter of fact, similarly to what we saw with overt causatives (24), sentences with the connective *because* (26a) do not entail sentences of the type illustrated in (26b):

(26) a. Pat is cooking spaghetti late because of the traffic jam. $\not\Rightarrow$
b. The traffic jam is the cause of Pat's cooking spaghetti, which was late.

To stress this point further, the following use of this connective emphasizes how sentences with *because* do not mark the choice of a salient condition. Assume that the doctor told Ann that, for her health, she should eat foods containing vitamin C. Prior to the doctor's appointment, Ann never ate such foods on a regular basis, but due to the doctor's recommendation, she decided to eat every day a different type of food with vitamin C: Sunday – Guava; Monday – Broccoli; Tuesday – Kale; Wednesday – Oranges. In this context, it is reasonable to say (27a), which does not entail (27b), since *The Cause* is the requirements of vitamin C for her well-being.

(27) a. Ann ate broccoli today because it's Monday. $\not\Rightarrow$
b. The fact that today is Monday is the cause for her eating of broccoli today.

We turn now to the connective *from.* Although it too, similarly to *because*, covers cases included under the category of grounding as in (28) (cf. Maienborn & Hertfelder's 2015, 2017 stative reading of causation), interestingly, when *from*-PPs express a causal relation as in (29), as far as we could observe, sentences with this type of PP pass the test in (22). The entailment described in (29) seems to hold firmly:

(28) The table is black from the ants. (Maienborn & Hertfelder 2015)
(29) A British woman died from drinking too much water while hiking. $\Rightarrow$ Drinking too much water was the cause of her death.

In order to stress further the difference in this respect between *from* and *because* further, let us consider the toy example with the burning house above, and the three possible causes, all necessary, enumerated for the result to take place: the presence of oxygen in the air, the house's construction from flammable material and the discarded cigarette butt, each with a different connective.

(30) a. #The house burned down **from** the oxygen in the air.
b. #The house burned down **from** the flammable material.
c. The house burned down **from** the discarded cigarette butt.

(31) a. The house burned down **because of** the oxygen in the air.
b. The house burned down **because of** the flammable material.
c. The house burned down **because of** the discarded cigarette.

It is therefore plain to see that *because* differs from *from*-PP in allowing just any causal condition to appear in its complement position, whereas *from* is restricted to the one condition that entails (22). We return to other peculiarities in the construction with *from*-PPs in Sect. 1.5.

1.4.3 Lexical Causatives

In the case of lexical causatives with change of state verbs, the participant denoted by the subject of the clause is intuitively qualified as *The Cause*. For example, sentence (32a), stated without a specific context, seems to entail (32b):

(32) a. The baby opened the door. $\Rightarrow$
b. The baby is the cause for the opening of the door.

However, when implemented in a broader context, (32a) does not entail (32b).

(33) a. After the mother pushed his hand over the button, the baby opened the door. $\not\Rightarrow$
b. The baby is the cause for the opening of the door.

While the baby is definitely a causal factor, or an enabling condition, it is still not *The Cause* for the opening of the door. The standard judgment would be that the action of the mother is *The Cause*, and the baby is more like an instrument. Consider also (34):

(34) a. The key opened the door. $\not\Rightarrow$
b. The key is the cause for the opening of the door.

Thus, the apparent entailment in (32) does not derive from the meaning of the lexical causative. It is simply the case that often the subject of such sentences is also the salient cause.

Finally, in the case of caused activity verbs a similar picture obtains. Considering (35a), this sentence can be stated to describe a party in which the kids started to dance as soon as there was music, and where at some stage of the party, there was such a rhythm that made them jump even more. Under such circumstances, (35a) does not entail (35b), since *The Cause* for the dancing can be argued to be the party and the music in general:

(35) a. ha-kecev hikpic et ha-yeladim ⇏
the-rhythm jump.CAUSE ACC the-kids
'The rhythm caused/made the kids (to) jump.'

b. ha-kecev haya ha-siba še-ha-yeladim kafcu
the-rhythm was the-cause that-the-kids jumped
'The was the cause that the kids jumped.'

This last observation is not surprising. If the dependency of such verbs does not necessarily involve counterfactuality, as was demonstrated in Sect. 1.3, then (c) in this type of construction is not even *a cause*, as it cannot be construed as a necessary condition, all the more so it would not be *The Cause.*

1.4.4 Summary

While causative constructions often describe situations in which (c) can be depicted also as *The Cause* of (e), it is not necessarily so. Thus, for most constructions, selection of the salient cause is not part of the truth conditions of D and are not associated with its implicatures as well. Among our observations in this section, it is worth repeating the following:

I. In some of the cases, (c) is merely an enabling condition or a causal factor; for example, change of state verbs in (33)–(34), and the connective *because*.
II. (c) does not always indicate *The Cause* of (e), but a reason for some qualification of the event/state denoted by the (e), as we saw in example (24).
III. (c) in various constructions represents the ground or an explanation and therefore lies outside of the scope of causation, as in example (25).
IV. Different causal constructions have different truth conditions, some of them require that (c) be *a* cause, and others, like the connective *from*-PP, require that it be *a* or *the* salient condition.

Finally, the discussion at the end of Sect. 1.4.1 suggests that *Causal Selection* is part of the meaning of some of the causative constructions and not others. Thus, whatever motivates such selections should not have a bearing on the metaphysical characterization of causal relations. One crucial outcome of this discussion is the need to carefully distinguish between causal relations and the features of the linguistic expressions that describe them. Another outcome is that in relying on linguistic intuitions as indicators for "the folk theory of causation", one must be

Table 1.2 Causal Selection in causative constructions

D^c: $p_{cause}{}^{cDe} \not\Rightarrow$ (22)
D^c: $p_{because}{}^{cDe} \not\Rightarrow$ (22)
D^c: $p_{change\text{-}of\text{-}state}{}^{cDe} \not\Rightarrow$ (22)
D^c: $p_{caused\text{-}activity}{}^{cDe} \not\Rightarrow$ (22)
D^c: $p_{from}{}^{cDe} \Rightarrow$ (22)

aware that not all constructions have the same truth conditions. This constitutes the basis for answering Question C (Table 1.2).

1.5 Causation Under Negation

Previous sections took as their starting point ideas that were developed in the philosophical literature and examined their relevance to the understanding of linguistic causative constructions. This section takes the opposite direction, as it revolves around the linguistic phenomenon of negation – considering the various interpretations causative constructions may have when interacting with sentential and constituent negation. Studying the interpretation of these constructions under negation is another way to grasp their meaning, since only that which is asserted can fall under the scope of negation.

It may come as no surprise that the outcome of this consideration reaches the same result as in previous sections: causative constructions do not pattern alike. As before, we pay attention to whether the differences between the constructions are related to their distinctive syntactic features, or whether they reflect differences between the dependencies each construction encodes.

1.5.1 Negating the Dependency: D Entailed or Not?

Taking *p* to represent the entire relevant linguistic expression, namely, the entire proposition with the relevant verbs and their arguments, or the connectors and their relata, the question to be answered is the following: what is the relation between *p* and the construct [c] D [e] underlying *p* in each type of causative constructions: Does *p* assert the relation D expressed by [c] D [e], or does it presuppose it? Can D be not-at-issue?

Prima facie, sentential negation indicates that the root-proposition *p*, the one without negation, is false. Consequently, there can be two types of "truth-makers" that falsify the root-proposition of the form p^{cDe}: either (i) both the (c) and the (e) took place, but there is no dependency between them [(c&e&$\sim$(cDe) => $\sim p^{cDe}$] – if this is the case, then clearly D is asserted; or (ii) such a negative statement can be true due to the fact that one of the members of the relata did not occur and then

[(∼c) or (∼e) => $\sim p^{cDe}$]. If D is not asserted, the first option should, therefore, be unavailable.

We set aside readings where negation operates on a focused constituent, e.g. *THE KEY didn't open the door, the card did*.[35]

In constructions realizing D overtly, such as overt causative verbs and connectives, the dependency is part of the assertion, and can be targeted by negation, as the following examples demonstrate:

(36) a. [$_c$ The neighbor / the music] **didn't cause / didn't make** [$_e$ the kids (to) dance].

b. [$_c$ ha-šxena / the-neighbor / | ha-musika the-music | **lo** NEG | **garma** made | [$_e$ la-yeladim to.the-children | lirkod]. to.dance

(36) is true in a situation where there was music and the kids danced, and the claim is that one didn't induce the other. Similarly, (37a)–(38a), with connectives, can describe the same state of affairs:

(37) a. [$_e$ The kids were not afraid] **because of** [$_c$ the wind].

b. [$_e$ The door didn't open **because of / from** [$_c$ the wind].

(38) a. [$_e$ ha-yeladim the-kids | lo NEG | paxadu] be.afraid | **biglal / me-** because / from | [$_c$ ha-ruax]. the-wind

b. [$_e$ ha-delet lo the-door NEG | niftexa] opened | **biglal /** because / | **me-** from | [$_c$ ha-ruax]. the-wind

Since negation can capture any overt element in the sentence, it is not surprising that in all of these constructions the morphologically represented D can be negated. It is therefore interesting to examine whether this is true also when the expression of the dependency is covert as in lexical causatives.

And indeed, in lexical causatives denoting a change of state, D cannot be targeted by negation, namely $\sim p$ cannot be interpreted as c&e&∼[cDe], rather $\sim p$ only entails ∼(e) without reference to the D. Consider (39):

(39) a. John didn't open the door.

b. The wind didn't open the door.

Both sentences never describe a state of affairs in which John did the relevant action or the wind blew, and the door is open, but nevertheless the door was open

[35] In constituent negation, or in negation with focus, the causal relation can be *de facto* negated. This is the outcome of several factors: (i) the definite expression, *the key*, comes with a presupposition of existence; (ii) focus contributes the negation of the alternative propositions, with different (c)s to the same (e), i.e. [not (card not open the door) = the card opened the door]. Since both (c) and (e) hold, it is indeed only D that doesn't. Moreover, it is possible to get contrastive readings without focus (as Larry Horn informed us). This might be related to the fact that causality is often asserted in the context of negating the contextual alternative-set (see the discussion earlier in Sect. 1.4.1). For our purposes, we seek cases in which negation does not involve a clear case of affirmation of one or more contextual alternatives.

due to some other factor or condition. The only available reading (again, without focus in this sentence) is one where the result state is negated, namely, the effect does not hold. In this case the door must be closed. Crucially, negation never targets the claim that the dependency holds [c**D**e].

This is an interesting result. As we saw in Sect. 1.3, $p_{\text{change-of-state}}{}^{\text{cDe}}$ entails counterfactuality (19), and thus D is part of its meaning. However, given that D cannot be captured by negation it is then not part of the assertion, nor is it presupposed, since it does not project under negation. It seems therefore plausible to suggest that in this construction counterfactuality arises as a Conventional Implicature, since it is entailed but is non-cancelable. In Sect. 1.5.2, we elaborate further on negating caused change of state verbs.

As for verbs expressing caused activity, we saw earlier, in (20), that they do not entail counterfactuality.

(40) ha-zamar lo hirkid et ha-yeladim.
The-singer NEG dance.CAUSE ACC the-kids
≈'The singer did not cause the kids to dance.'

This sentence can be true either when the kids did not dance, or when there is no dependency relation between the singer preforming the relevant action and the kids' dancing, namely, the singer's actions did not lead to the kids' dancing.

In Bar-Asher Siegal & Boneh (2019), we propose a detailed analysis of the causal semantics of the two sub-classes of lexical causative verbs and the way they pattern under negation. Relying on the interplay between necessary and sufficient conditions and the notion of *potentially sufficient* relevant for capturing their meanings, they demonstrate that in fixed contexts, sentences such as (39)–(40) actually presuppose some knowledge about the dependency relation (cDe), and that this knowledge projects under negation, even if D, as described here, does not (see below Sect. 1.5.3.2).

Several conclusions emerge from this short discussion:

I. Overt causative expressions assert [cDe], namely a dependency relation. This is so even if this dependency is not strictly causal, i.e. when the connectives *because* and *from*-PP realize a D that expresses other dependencies such as grounding.
II. In change of state verbs the dependency D of the relation [cDe] cannot be negated, thus it is not asserted. The counterfactuality meaning component of D is a Conventional Implicature.
III. In caused activity verbs, negation may capture [cDe], where D does not entail counterfactuality.

In Sect. 1.6, we present an additional type of causative construction – the Affected Participant construction – in which D will be shown to be presupposed. This section reaffirms what has started to emerge in Sect. 1.3, that the nature of D is not monolithic, and varies in different ways from one construction to another (Table 1.3).

Table 1.3 D is asserted (one of the truth makers of ~p is (c&e& ~[cDe]))

$p_{cause}{}^{cDe} \Rightarrow$ c&e&[cDe]
$p_{because}{}^{cDe} \Rightarrow$ c&e&[cDe]
$p_{from}{}^{cDe} \Rightarrow$ c&e&[cDe]
$p_{change\text{-}of\text{-}state}{}^{cDe} \Rightarrow$ [c&e]
c&e&~[cDe] $\Rightarrow$ ~$p_{caused\ activity}{}^{cDe}$

1.5.2 Negating the Dependents

In this section, we set out to examine dependencies in which at least one of the participants of the relata is negative [(~c)D(e)] or [(c)D(~e)].

(41) a. [$_c$ NEG taking the medicine] D [$_e$ her death]
b. [$_c$ breaking the key in the lock] D [$_e$ NEG the door open]

Assuming that the possibility of negating (c) and (e) is indicative of predication at some level of the linguistic representation, (c) and (e) should then denote an event / a proposition / an instantiation of a property, rather than an individual. Accordingly, at least *prima facie*, the possibility to negate the constituents that are taken to instantiate the relata allows us to advance the discussion of their nature.

In this respect, it is necessary to note that philosophers disagree as to the availability of absence as a cause. However, even philosophers who deny that absence can be a cause, admit that we often explain causal relations with the non-occurrence of certain events (cf. Lewis 2004; Beebee 2004; McGrath 2005).

We hypothesize that the possibility to negate either (c) or (e) suggests that causation necessarily holds between events, conceptually, but in many cases also linguistically.

In what follows, we start examining this hypothesis, by passing under review the various causative constructions, observing whether (c) or (e) fall under the scope of negation, be it constituent negation or clausal negation, completing the picture from Sect. 1.5.1. We substantiate this hypothesis further in Sects. 1.5.3.1 and 1.6.

Starting with overt causatives, it can be observed that when (c) or (e) denote events, constituent negation is available:

(42) a. His **not** standing still caused the window to open. [~c] D [e]
b. Her **not** drinkig water caused her to die.
c. **i-**kibuy ha-eš garam la-mayim lirtoax.
NEG-turning.off the-fire caused/made to.the-water boil.INF
'The non-turning off of the fire caused / made the water (to) boil.'

(43) a. His standing still caused the window **not** to open. [c] D [~e]
b. Her drinking water caused her **not** to die.
c. kibuy ha-eš garam la-mayim **lo** lirtoax.
turning.off the-fire caused/made to.the-water NEG boil.INF
The turning off of the fire caused / made the water (to) boil.

In comparison, to a certain extent, the application of constituent negation is possible also with lexical causatives, but it is not as freely available as with overt ones. Examples (44a-b) illustrate the variability of application of constituent negation on (c).

(44) a. (*__i__-)kibuy ha-eš hirtiax et ha-mayim.
NEG-turning.off the-fire boiled ACC the-water
b. __i__-kibuy orot me'ir yeladim ba-lyla.
NEG-turning.off light wakes.up children in.the-night
'The non-turning off of the lights wakes up children at night.'
c. His **not** giving-up smoking killed him.

It seems, therefore, reasonable to seek for a semantic characterization to account for the availability of constituent negation with lexical causatives, this is, however, beyond the scope of the current paper.

Now, while (c) and (e) can be negated via constituent negation, only in causative constructions with connectives, relata can fall under the scope of sentential negation, without also negating D. In the case of the connective *because (of)*, for example, clausal negation regularly induces two possible readings. In one of them, it can apply to (e) alone (cf. Jespersen 1917: 47; Lakoff 1970; Johnston 1994; Kadmon & Landman 1993):

(45) She didn't lose this trial **because** of the witness' death.
i. 'It's not the case that she lost this trial because of the witness' death.' ~[[c] D [e]]
ii. 'The witness' death is the cause of her not losing this trial.' [c] D [~e]

(46) hi lo meta **biglal** ha-trufot.
She NEG died.F.SG because (of) the-medicines
i. 'It is not the case that she died because of the medicine.' ~[[c] D [e]]
ii. 'Due to the medicine she did not die. (had she not taken the medicine should would have died)' [c] D [~e]

In contrast to *because*, in the case of *from,* the following examples from English (47) and Hebrew (48), demonstrate that negation has only wide scope over the proposition.

(47) She didn't die **from** the medicine.

(48) hi lo meta **me**-ha-trufot.
She NEG died.F.SG from-the-medicines
i. 'It is not the case that she died from the medicine'. ~[[c] D [e]]
ii. '#The medicine was the cause of her survival.' #[c] D [~e]

However, the following sentences are fine with negation scoping under *from*-PP:

(49) hi lo barxa **me**-ha-paxad
She NEG run.away.F.SG from-the-fear
i. 'It is not that case that she ran away out of fear'.
ii. 'Fear caused her not to run away, to stay put.' [c] D [~e]

(50) hi lo metafkedet **me**-ha-laxac
She NEG function.F.SG from-the-stress
i. 'It is not the case that she is functioning due to stress'.
ii. 'Stress causes her to be dysfunctional.' [c] D [~e]

(51) The window didn't open **from** the wind.
i. 'It is not the case that the wind opened the window.'
ii. 'The wind prevented the opening of the window' [c] D [~e]

We contend that the possibility for negation to scope low in *from*-PP constructions, targeting (e), depends, at least in some cases, on what the normal state of affairs is. In (48), one is normally taken to be alive, and dying is the deviation from the norm, but in (49) the normal state of affairs is not to run away, and in (50) the normal state of affairs is to function.[36] This can also be the case with windows that in their default position are closed (51). We leave this issue for further research.

At this point, it is enough to repeat what has been mentioned in Sect. 1.4, that a causal factor in *Causal Selection* has often something to do with deviation from the norm. This is another case in which the causative construction with *from*-PP exhibits additional requirements with respect to what can be part of the relata.

Syntactically speaking, the make-up of causative constructions with connectives is such that negation can be interpreted with two different scopes.[37] This is presumably due to the fact that the PP with *because/from,* is an adjunct that can

[36] An additional factor for the availability of a local negation with connectives seems to be lexical. Consider the following pair in Hebrew featuring the connectives *merov* vs. *mitox*:

(i) ha-delet lo niftexa **me-rov** laxac. [c] D [~e]
The-door NEG opened.F.SG from-abundance pressure
i. 'The door did not open due to the pressure on it.'
ii. 'It is not the case that the door opened from the pressure.'
(ii) ha-delet lo niftexa **mi-tox** laxac.
The-door NEG opened.F.SG from-within pressure
'It is not the case that the door opened out of pressure.'

[37] The conjunction *since* has only the narrow scope reading. Iatridou (1991: 81–90) relates this to the fact that the content of the *since*-clause is presupposed. See also Charnavel's paper this volume about the differences between *since*-clause and *because*-clause.

have two attachment sites (Johnston 1994).[38] Schematically, there are two scopal options for the interaction between negation, a sentence and its adjunct component:

(52) a. [(*because* of X) ~(P)]
b. ~[(P) (*because* of X)]

In contrast, sentential negation in overt causatives does not target only the occurrence of (e) or (c). In (53), as illustrated in the previous section, D necessarily falls under the scope of negation.

(53) He didn't cause the opening of the window.

i. It is not the case that he caused the opening of the window	~[[c] D [e]]
ii. # He is the cause of the non-opening of the window.	[c] D[~e]
iii. # He didn't engage in an activity and as a result the window opened.	[~c] D [e]

As noted earlier, sentential negation, indicates that the root-proposition, which asserts for a dependency (p^{cDe}) is false, and there can be two types of "truth-makers" that falsify the root-proposition: either both the (c) and the (e) took place, but there is no dependency between them [(c&e&~(cDe) => $\sim p^{cDe}$], or one of the members of the relata did not occur [(~c) or (~e) => $\sim p^{cDe}$]. Note that these two options correlate with the contrast between sentences with a definite and an indefinite (e):

(54) a. He didn't cause **the** opening of the window. [(c&e&~(cDe) => $\sim p^{cDe}$]
b. He didn't cause **an** opening of the window. [(~e) => $\sim p^{cDe}$]

This contrast results from the existential presupposition that comes with definite expressions (Strawson 1950).

Lastly, we turn to consider lexical causatives negated by sentential negation, first with change of state verbs. The discussion in Sect. 1.5.1 demonstrated that the dependency in this causative construction is not asserted, hence there is only one type of "truth-maker" that can falsify the root-proposition, the non-occurrence of the cause or of the effect [(~c) or (~e) => $\sim p^{cDe}$], in (55) it is (~e); in (56) it can also be (~c).

(55) The baby didn't open the door.
[possible state-of-affairs: The baby's action did not lead to the door to be open]

(56) Fire did not boil the water.
[possible state-of-affairs: There was no fire, and therefore it must not have been the cause for boiling the water]

In verbs denoting caused activity, falsifying the root sentence can also be due to the fact that the effect or the cause did not take place:

[38]Horn (2018), following Jespersen (1917: 47), related the availability of the second reading (the wide scope reading of the negation) to the broader phenomenon of Neg-first.

(57) hu lo hirkid et ha-yeladim.
He NEG dance.CAUSE ACC the-kids
'It is not the case that he made the kids to dance, (as they didn't dance).'

As we saw in Sect. 1.3, the root-sentences of caused activity verbs do not entail a counterfactual relation between the (c) and the (e). The root sentence in (57) can describe a state of affairs in which the subject merely did an action that could have been sufficient to bring about the effect (Bar-Asher Siegal & Boneh 2019). Thus, (57) can negate such a state of affairs, and can mean "he did not do whatever was sufficient to make the kids dance." *De facto,* since such claims assume the occurrence of both (c) and (e), this state of affairs amounts to the negation of the causal dependency itself [(c&e&~(cDe) => $\sim p^{cDe}$].

Thus, contrary to connectives, where the syntax overtly allows putting two events in relation, with overt causatives and most lexical causative verbs, negation cannot directly target one of (c) or (e) disjoint from D. Oddly, in this respect caused activity verbs and overt causatives pattern alike. Change of state causatives stand in stark contrast to these two since they readily render available a negated (e) or (c).

The observations from this section raise once again the question of the degree of uniformity underlying causative constructions. However, following the proposed analysis, the main difference between the constructions is accounted for by the way sentential negation interacts with various syntactic components of the causative constructions. Other differences stem from semantic factors such as those pointed out with respect to negating (e) in *from*-PP constructions. This discussion reveals the delicate interplay between semantic differences among constructions, and the Ds encoded in them.

Furthermore, these observations pave the way to examining the hypothesis formulated at the beginning of this section, whereby:

(58) The possibility to negate one of (c) or (e) suggests that causation necessarily holds between events.

We turn to this in the next sub-section.

1.5.3 Discussion and outlook

1.5.3.1 The nature of the Relata

Following the observation that only adjuncts can scope above negation, we would like to demonstrate that not all adjuncts interact similarly with sentential negation, and in this way provide support for hypothesis (58).

Consider (59), where again, as with negation in connectives, either she wasn't the reason for Dani's flying abroad, or she was the reason why he did not fly abroad. In this respect, causative connectives pattern exactly like purpose clauses, or beneficiary clauses. This is exemplified in (60), where, either Dani flew abroad

but not for her sake, or it was for her sake that he didn't fly abroad. Thus, in both examples, (at least) two possibilities exist to interpret the sentence: either she was the cause / purpose of a negative event, or she wasn't the cause / purpose of a positive event.

(59) dani **lo** tas **biglala** lexul.
Dani NEG flew because.of.her abroad
i. 'It was not the case that Dani had a flight abroad whose reason was her (Dani either didn't fly abroad, or she was not the reason for his flying abroad).'
ii. 'She was the reason he didn't fly (he didn't fly & it was because of her).'

(60) dani **lo** tas **bišvila** lexul.
Dani NEG flew for.her abroad
i. 'It was not the case that Dani had a flight abroad for her (Dani either didn't fly, or he flew but not for her).'
ii. 'It was for her that Dani didn't fly abroad (i.e. he stayed home for her sake).'

These adjuncts will be dubbed **Group 1** adjuncts, which are bi-eventive. Group 1 adjuncts radically differ from another group of adjuncts that cannot interact in the same way with negation – **Group 2**. In example (61), the comitative phrase cannot be severed from the underlying eventuality when negation is present; namely, a reading where the adjunct escapes the scope of negation and only the underlying eventuality is negated is not possible. Similarly, in (62), an instrumental adjunct cannot escape the scope of negation. In both (61) and (62) the adjunct cannot be added to the negated eventuality, and the ambiguity attested in (59)-(60) is not available.

(61) dani **lo** tas **ita** lexul.
Dani NEG flew with.her abroad
i. 'It is not the case that Dani flew with her abroad (either he did not fly, or he flew without her).'
ii. '#Dani's not flying was with her.'

(62) dani **lo** axal suši **be-mazleg**.
Dani NEG ate sushi with-fork
i. 'It is not the case that Dani ate sushi with a fork (either he didn't eat, or he ate sushi without a fork).'
ii. '#Dani's not eating sushi was with a fork.'

Group 2 adjuncts pattern like Patients/direct objects. They too cannot escape the scope of negation. In (63), the patient cannot be added to a negative event.

(63) dani **lo** pagaš / ra'a / hikir **ota** b-exul.
Dani NEG met / saw / knew her in-abroad
i. 'It is not the case that Dani met / saw / knew her abroad.'
ii. '#Dani's not meeting / seeing / knowing abroad was of her.'

In summary, the two groups of adjuncts and the possibility to scopally interact with negation can be schematized as follows:

(64) a. **Group 1**: *cause, purpose, beneficiary*
   i. ~[P + ADJUNCT]
   ii. ADJUNCT ~P
   b. **Group 2**: *comitative, instrument,* also *patient*
   i. ~[P + ADJUNCT]
   ii. #ADJUNCT ~P

It is reasonable to suggest that the two groups differ as to how the adjuncts interact with the eventuality of the main predication: those of Group 2 add information about the eventuality of the main predication, and instantiate relations between individual denoting arguments; therefore, negation can only have wide scope over the adjunct. In contrast, adjuncts of Group 1 introduce another eventuality and express a dependency between the eventuality of the main predication and other eventualities.

In other words, adjuncts like *with*-PP (61) behave similarly to an argument of a predicate (63), as they add a participant to the same event, while "*because* of someone" and "*for* someone" add either the (c) for the event described by the main predication (59), or the (e) of the main predication (60).

Importantly, the idea underlying this set of facts is that while it is possible to assert a dependency relation with the non-occurrence of an event (hence the possibility to be above the scope of negation), it is meaningless to add information about an event which did not take place.

Moreover, the significance of this discussion is that even if, *prima facie*, there are no clear linguistic indications that causative constructions involve events, there are linguistic facts that require the assumptions that the relata of causative constructions are events (cf. Neeleman & van de Koot 2012). Accordingly, it is possible that the conceptual and syntactic representations of the dependency relation expressed by the causative construction are in fact dissociated. While at the syntactic level, the (c) does not include an event, the NP/DP in such position must be a participant, as was already proposed by Dowty (1979).

1.5.3.2 A Note About $p_{because}{}^{cDe}$ and $p_{caused\text{-}activity}{}^{cDe}$

At this point, one may wonder why $p_{because}{}^{cDe}$ and $p_{caused\text{-}activity}{}^{cDe}$ are included among causative constructions, as they do not even entail counterfactuality. It should be kept in mind though, as clarified in the introduction, that we defined causative constructions in a schematically broad manner, enabling a multifaceted examination of the part of the causative construction cDe, where D does not necessarily involve one particular type of dependency.

Thus, although in many cases, $p_{because}{}^{cDe}$ and $p_{caused\text{-}activity}{}^{cDe}$ do not obligatorily entail typical *causal relation*s, they do describe such relations, including counter-

factuality, which is assumed to hold between (c) and (e) in many contexts. In this paper, we did not provide a full account of the semantics of the constructions, but we would like to elaborate somewhat on them, and on why they most often express counterfactual dependencies.

As noted in the philosophical literature, $p_{because}{}^{cDe}$ answers all types of "why questions" (*inter alia* van Frassen 1980), thus it provides answers in the broad sense of "reasoning". Among the means at our diposal for reasoning about situations / events / facts, it is very common to provide causal explanations. Therefore, it comes with no surprise that this construction describes causal relations as well.

As for $p_{caused\text{-}activity}{}^{cDe}$, clearly it often does not assert that it is *de facto* (c) which brought about (e), as this construction can describe situations in which (e) precedes (c). Bar-Asher Siegal & Boneh (2019) argue that in this construction, D triggers the presupposition that (c) is a potential sufficient condition for (e), and propose the definition of sufficient conditions in (65):

(65) $\{c \mid \sim Oe \vDash \sim Oc\}$

This definition expresses the fact that part of the lexical content of a given lexical causative verb consists in the type of events which are sufficient for bringing about the result described in the given (e). Thus, (65) states, for a causative verb in a given context, the presupposed knowledge of types of events (c), such that the non-occurrence of (e) necessitates their non-occurrence as well. In other words, (c) must have the potential of being a sufficient condition for the (e). It is not surprising, therefore, that more often than not, this construction is used when (c) is *de facto* the (c) which brought about (e). For more details, see Bar-Asher Siegal & Boneh (2019).

1.6 Covert Causation: Affected Participant Constructions

We wish to conclude this paper by adding another type of causative construction – one which features an Affected Participant.

It has been claimed with respect to various constructions that they involve a participant affected by the event described in the clause (for example, O'Connor 2007, and more broadly Beavers 2011). Since the idea that an event participant is affected by some occurrence implicates some notion of causation, it is only natural to consider this type of constructions as part of the current discussion. In addition, this inquiry demonstrates the significance of the observations from the previous sections to a broader range of linguistic phenomena.

1.6.1 General Properties

In the construction under discussion, the Affected Participant is added to a clause either via a dativa l expression (the preposition *l-* in Hebrew, see also Hole 2005, 2006), or with a prepositional element like *on* in English. In this construction, we claim, the dependency holds between the expressed eventuality and a contextually determined one. This dependency has already been analyzed as having a causative component of meaning (cf. Bosse et al. 2012; Bar-Asher Siegal & Boneh 2015).

Consider the following attested example from Modern Hebrew, where the relevant clause containing the affected dative marked participant is found in an embedded interrogative:

(66) od Eli Zohar lo yaxol lišk'ax ex [$_c$ met [$_e$ **lo]** pa'am ed
Att. E. Z. NEG can forget how died **to.him** once witness
be-'emca xakira negdit]
in-middle investigation cross
'Attorney Eli Zohar cannot forget how a witness once died **on him** during a cross investigation.'

This example conveys that the death of the witness during the cross investigation caused Attorney Eli Zohar to lose the trial. He was unable to win the case due to the witness' premature death. Note that the particular effect of the concrete and psychological damage caused by the witness' death is accommodated and gathered from context and world knowledge. Similar content is expressed in English with the introduction of an additional participant following the preposition *on* (cf. Bosse 2015).

(67) [$_c$ The old bugger (went and) died] [$_e$ **on me]**.

Schematically, the causal relation can be depicted in (68):

(68) [$_c$ The old bugger/the witness died] D [$_{e\text{-context}}$ Attorney Eli Zohar cannot win the trial/the situation made it difficult for attorney Eli Zohar to win the case]

While the precise nature of the effect is determined contextually in both languages, whether the effect is positive or negative is determined contextually in Modern Hebrew, but lexically in English, as the preposition *on* seems only to give rise to a negative effect on the added participant. In both cases, D is implicit.

Consider an additional example, where the relevant clause, schematized in (69'), is overtly part of a conjunction:

(69) axarkax hu tas **li** le-šana la-mizrax,
Then he flew to.me to-year to.the-east,
ve-hiš'ir oti xareda ve-lexuca
and-left me anxious and-stressed

(69') [$_c$ He flew to the Far East for a year] D [$_{e\text{-context}}$ I am anxious and distressed]

The precise nature of the effect in (69) is clarified by the conjoined clause indicating that the effect can be psychological, not only a material one.

In what follows, we examine the properties of D in this particular construction, along the lines of the investigation for the other constructions presented in Sects. 1.3, 1.4 and 1.5.

1.6.2 Counterfactuality Under Negation

While in the other constructions, D was either asserted or implied (cf. Sect. 1.5.1 above), in this construction D is presupposed, as it projects under negation. Interestingly, projection under negation, which is a prominent feature of presupposition, allows a clear access to the content of D, in this case. Furthermore, in this construction, it can give rise to counterfactuality transparently. Let us consider in turn (70) and (71), in Modern Hebrew and English, respectively:

(70) ha-ed lo met **li**.
the-witness NEG die to.me
'It's not the case that the witness died'. [implied: Had he died, I would have been affected, e.g. by loss of reputation]

(71) The old bugger didn't die **on me**.
'It is not the case that the old bugger died.' [implied: had he died I would have been affected by e.g. sadness, sense of loss]

Under negation, the only contribution of adding the dativa l expression *li*, in (70), and of the PP *on me*, in (71), is the counterfactual implication, which is not explicitly phrased, but implied from the negative sentence. In comparison, consider the following equivalent negated sentences without the affected participant, where the counterfactual inference is absent:

(70') ha-ed lo met.
the-witness NEG die
'The witness didn't die / It's not the case that the witness died.'
#Had he died, ...

(71') The old bugger didn't die.
It is not the case that the old bugger died. #Had he died, ...

This counterfactual element can be accommodated, if we assume the following two components for this construction:

(72) a. D represents a counterfactual dependency.
b. D is presupposed, and as such projected under negation.

Bar-Asher Siegal & Boneh (2015), therefore, propose (73) as the semantic representation of the Affected Participant in Modern Hebrew, and presumably also *on* in English, which describes D in terms of a relation between events:

(73) [[*AP*]]= λe.λe'.λF.λG.λx:(~Fe □→ ~$_{\supset}$Ge')=1.Fe & Participant(x, e')=1[39]

In this formula:

a. Fe is an abbreviation for everything which the underlying sentence without the dative expression states to be true about the event it describes (in (59), *the witness' dying*). This is (c) of the causal construction.
b. Ge' is a description of the effect, which is the relevant state of affairs known or given by the context (contextual knowledge is indicated with $_{\supset}$). The DP within the PP (be it *le-* or *on*) is a participant in the eventuality that is the effect.
c. (~Fe □→ ~$_{\supset}$Ge') captures counterfactuality: if Fe takes place, Ge must take place as well; moreover, if Fe does not hold, Ge must not either. Thus, when it is asserted that Fe did not take place, the counterfactual claim surfaces as part of the meaning. This dependency is presupposed and not asserted.

Given all this, even when the underlying clause is negated: ~Fe, (~Fe □→ ~$_{\supset}$Ge') holds true. This is the origin of the counterfactual reading under negation demonstrated in (70)–(71). Therefore, Affected Participant constructions are an example where counterfactuality is directly relevant for the meaning of the linguistic expression in question.[40]

1.6.3 Negating the Relata

Still in the realm of negation, we move on to consider the properties of negating the relata of D in this construction. It emerges that in Modern Hebrew, the construction displays the mirror image of connectives, as clausal negation can target (c). Consider the following examples, where (74) repeats (70) and shows that the Affected Participant patterns like Group 1 adjuncts, allowing negation to scope under it:

(74) **Context**: said by a gangster facing imprisonment

lo	met	li	ha-ed.
NEG	die	to.me	the-witness

i. 'It is not the case that the witness died on me.' ~[[c] D [e]]
ii. 'The witness' not dying affects the speaker (e.g. he is not acquitted).' [~c] D [e]

Here is an additional example with its context:

[39]Bar-Asher Siegal & Boneh (2015) also added the presupposition of precedence in time (e≤e') between the eventualities, a presupposition customarily related to causation (see also fn. 41 below).

[40]Nothing in the morpho-syntactic constitution of this constructions indicates at first blush that this is a causative construction, however one may want to consider in this context the applicative/causative syncretism in Indonesian languages (see Kroeger 2007).

(75) **Context**: Danny is sitting in a speeding car, which does not make a stop when it should, putting his life in danger:

hu lo acar le-dani be-adom.
he NEG stop to-Danny in-red (light)
'He did not stop at the red light for/on Danny.'

i. 'It is not the case that he stopped at the red light on/for Danny.' ~[[c] D [e]]
ii. 'The non-stopping at the red light affected Danny.' (e.g. he was scared) [~c] D [e]

Interestingly though, the availability of two scopes for negation in Hebrew Affected Participant constructions is not shared by English *on*-PP construction, where clausal negation cannot target (c):

(76) The old bugger didn't die on me.
i. It's not the case that the bugger died on me. Had he died, I would have been affected by e.g. not knowing how to handle the estate.
ii. #The witness' not dying affects the speaker [e.g. said by a gangster facing imprisonment].

This cross-linguistic difference may stem from a syntactic difference between the two constructions, regarding the height of attachment of the two PPs. We leave this unexplored for the time being.

Crucially, though, a clear contrast emerges between the Hebrew Affected Participant, which is a non-selected dative and ditransitives featuring selected datives:

(77) hu lo natan matanot la-yeladim.
He NEG gave presents to.the-kids
i. 'It is not the case that he gave presents to the kids.'
ii. #He did not give presents and it was to the kids / his not giving presents was to the kids.

Ditransitives are caused change of location verbs or caused possession verbs (cf. Rappaport Hovav & Levin 2008; Beavers 2011), and therefore fall under lexical change of state causatives, extensively discussed above.

The contrast between the possibility to negate (c) brings us back to the discussion in Sects. 1.5.2 and 1.5.3.1: adjuncts that denote an additional eventuality can scope out negation, whereas direct arguments of the verb and adjunct of the same eventuality cannot be outside of the scope of the negation. For our purposes, it is of significance that the Affected Dative patterns with Group 1 adjuncts, which supports the claim that it introduces another eventuality.

1.6.4 Concluding Remarks

To conclude the discussion of the Affected Participant construction in the framework of the current paper, we should consider the issue of *Causal Selection* (Sect. 1.4).

Interestingly, like the preposition *from*, discussed in Sect. 1.4.2, Affected Participant constructions demonstrate the type of entailment mentioned earlier in (22), and indicate that part of the meaning of the D involves a selection of a salient condition to construe (c). Thus, (69) entails (78) and (67) entails (79):[41]

(78) His flight to the Far East for a year is *the cause* for my anxiety and stress.

(79) The death of the old bugger is *the cause* for (my contextually determined) discontent / loss of the trial.

Sect. 1.6, then, provided us with further confirmation to issues discussed throughout this paper:

- There is no unique causal construal encoded across linguistic causative constructions.
- Counterfactuality is a significant component in the meaning of the dependency encoded in linguistic expressions. Affected Datives provide an example where counterfactuality is transparently entailed, as a presupposition.
- The fact that this construction lacks overt marking raises the issue of the linguistic origin of the causal content of the various constructions – an issue definitely worth pursuing.

The next section concludes the discussion, incorporating the findings regarding the Affected Participant construction with the others.

[41] Affected Participant constructions in Modern Hebrew also feature inanimate affected participants, where the verb's object and the dativa l expression hold a part-whole relation (see Bar-Asher Siegal & Boneh 2014):

(i) nišbar la-šulxan ha-regel.
broke to.the-table the-leg
'The leg of the table broke' / 'The table had a leg broken off of it.'

In this case, there is no separation between the breaking of the leg and the "effect" on the table, namely its lacking a leg; that is, (e) is part of (c), and they constitute one and the same event, where no temporal separation between (c) and (e) is possible. Thus, this is not a causal relation in the strict sense. However, interestingly, it is appropriate to refer to (c) as *The Cause*, in this case too:

(ii) švirat ha-regel hi ha-siba le.xax še-eyn la-šulxan regel.
breaking the-leg is the-reason to.so that-NEG to.the-table leg
'The breaking of the leg is the reason that the table doesn't have a leg.'

(iii) švirat ha-regel garma le.xax še-eyn la-šulxan regel.
breaking the-leg caused to.so that-NEG to.the-table leg
'The breaking of the leg is the reason that the table doesn't have a leg.'

We leave this puzzle for a future study.

1.7 Conclusions

The last four sections provided a survey regarding various semantic aspects of six causative constructions, the essence of which is now summarized in Table 1.4 below. The discussion began with the question regarding the relevance of philosophical accounts of causation for linguistic analyses of causal constructions (Sect. 1.1 Question A). Our survey demonstrated various discussions informed by ideas first developed as a metaphysical analysis for causal relations, motivating the assumption that question A should be answered positively, despite the rather limited goals of this paper, which do not provide a complete analysis of the construction's semantics.

Turning to the question of whether there is a one all-encompassing causative meaning component underlying the diverse linguistic phenomena (Sect. 1.1, Question B), first it became clear that these constructions do not necessarily encode causal relations. All of them, besides perhaps the verb *cause*, are not exclusive for the description of causal relations. Some denote also grounding relations and/or express other logical relations. Even in terms of the relation between the (c) and the (e) in these constructions, not all of them necessarily entail counterfactuality (Sect. 1.3).

The table below summarizes the properties of D studied in the various constructions throughout Sect. 1.3, 1.4, 1.5 and 1.6.

How should we characterize the differences between the causative constructions?

We may ask the following: do these differences necessitate some sort of causal pluralism? More specifically, do the differences indicate substantial differences with respect to the content of the D they denote? As we saw in Sects. 1.5.2, 1.5.3, and 1.5.3.1, some of the differences can be accounted for syntactically. But, it is not always clear how to account for the differences in this way, as constructions are grouped together according to some semantic feature, without any apparent correlation to their syntactic type.

Furthermore, although not all constructions demonstrate similar requirements as to what can be selected as the cause among the set of conditions, due to *Causal Selection* (Sect. 1.4), or due to additional requirements such as *direct causation,* described in Sect. 1.2.2, it is still possible to see that counterfactuality plays a central role in determining what can be *a cause*. Moreover, it became clear that constructions differ as to whether the dependencies they represent are asserted, conventionally implied or presupposed. It will be, therefore, important to understand why the constructions are not the same in this regard, and what can motivate such differences.

With respect to the nature of the relata, the discussion in Sects. 1.5.2 and 1.6 reveals that, despite the differences between the constructions as to the possibility to independently negate (e) or (c), the fact that this possibility exists both in the case of connectives, where D is overt, as well as in the case of Affected Participant constructions, where D is covert and presupposed, and (e) is realized as an individual (within a PP), suggests that at some level of the linguistic representation, the relata are event-like, and not individuals, in alignment with the philosophical conception.

Table 1.4 Summary

	p_{cause}^{cDe}	$p_{because}^{cDe}$	p_{from}^{cDe}	$p_{change\text{-}of\text{-}state}^{cDe}$	$p_{caused\text{-}activity}^{cDe}$	$P_{Affected\text{-}Participant}^{cDe}$
Counterfactuality entailed $p \Rightarrow (\sim c \,\square\!\!\rightarrow \sim e)$	☑ Asserted	☒	☑ Asserted	☑ Conventional implicature	☒	☑ Presupposed
D designates *The cause* $p \Rightarrow$ C is the cause of E	☒	☒	☑	☒	☒	☑
D entails $p \Rightarrow c\&e\&[cDe]$. Therefore, available reading under negation: $\sim p \Rightarrow c\&e\&\sim[cDe]$	☑	☑	☑	☒	☑ Indirectly entailed	☒ (projects under negation)
Additional meaning component			Direct causation / implies deviation from the norm	Direct causation		
Possibility to negate the relata (under sentential negaton) $\sim p$ available readings: [(∼c)D(e)], or [(c)D(∼e)]	☒	☑	☑/☒ semantic constraint at work	☒	☒	☑

Lastly, as for the philosophical discussions on causation and their sensitivity to the linguistic aspects of the data they rely upon (Sect. 1.1 Question C), a crucial result of this paper is the need to tease apart causal relations and the features of the linguistic expressions that describe them. Furthermore, in relying on linguistic intuitions as indicators for "the folk theory of causation", it is important to acknowledge that not all constructions have the same truth conditions. The semantic differences between causative constructions impose challenges to a methodology, common among philosophers, to rely on linguistic judgments in recognizing the intuitions that constitute this "folk theory of causation". As noted in Sect. 1.4, one is left to wonder whether philosophical accounts could have been different, had they referred to causative constructions other than those including overt causatives.

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