And Therefore

Bram Vaassen and Alex Sandgren

May 19, 2021

Penultimate Draft

Forthcoming in *Inquiry: An Interdisciplinary Journal of Philosophy*

Abstract

This article focuses on 'therefore' constructions such as 'The switch is on, and therefore the lights are on'. We submit that the contribution of 'therefore' is to express a dependence as part of the core content of these constructions, rather than being conveyed by conventional implicature (Grice 1975, Potts 2005, Neta 2013) or a triggered presupposition (Pavese 2017, forthcoming, Stokke 2017). We argue that the standard objections to this view can be answered by relying on the general projection hypothesis defended by Roberts et al. (2009) and Simons et al. (2010), leaving our view on solid ground.

Keywords: Therefore, Presupposition, Conventional Implicature, Projection, Grice

1 Introduction

It is uncontroversial that the use of 'therefore' in sentences like (1) conveys that a certain dependence holds.

> (1) The switch in the hall is on, and therefore the lights in the office are on.[1]

By uttering (1), the speaker can convey that the lights in the office are on due to the switch in the hall being on. Alternatively, the speaker can convey that her believing that the lights in the office are on is due to her believing that the switch in the hall is on (cf. Jenkins 2008, p. 73; see also Neta 2013). Either way, some dependence is conveyed by (1) and this observation holds for simple 'therefore' constructions generally.

The controversial question is *how* the dependence is conveyed. Some think this information is carried by conventional implicature (e.g. Grice, 1975; Potts, 2005, 2007; Neta, 2013). Others think this dependence is a triggered presupposition (e.g. Pavese, 2017; Stokke, 2017). In this article, we defend a view according to which the dependence conveyed by 'therefore' constructions is part of what we will call the 'core content' of such constructions. Varieties of this view are suggested by Bach (1999, p. 330), Neale (1999, p. 57), and Horn (2013, p. 191). However, recent work on 'therefore' tends to set such views aside without much discussion. For example, in a recent article, Pavese (forthcoming) discusses views according to which the dependence is either presupposed or conventionally implicated in-depth (p. 12–19), while summarily dismissing the view we defend here (p. 11–12). We will argue that this view in fact fits with the data levied against it.

First, we characterise what we will call 'core content' by distinguishing it from implicatures and presupposition triggers. Then we evaluate the principal objections against treating the dependence conveyed by 'therefore' constructions as part of the core content of these constructions. We argue that these objections can be met and conclude that, contrary to the recent contentions in the literature, the possibility of treating this dependence as part of the core

---

[1]We borrow this example from Stokke (2017, p. 133).

content should still be taken seriously.

2   Core Content and Grice on 'Therefore'

(2) conveys that Fatima's cheerfulness is due to her being Australian.[2] Whereas (3) merely conveys that Fatima is both Australian and cheerful.

> (2)   Fatima is Australian, therefore she is cheerful.
> (3)   Fatima is Australian and cheerful.

Like (2), most examples of 'therefore' constructions discussed in the literature concern a dependence between tokens, or particulars, like the dependence of one person's happiness on her financial security, rather than type-level dependencies, such as the dependence of happiness on financial security in general. Our focus here is on the token dependence that distinguishes (2) from (3).

An influential view in the literature says that this dependence is not part of what is literally said. According to this view, the dependence is merely presupposed or implicated by uttering claims like (2). This view finds a natural starting point in a passage from Grice (1975, p. 44–45 our italics):

> If I say (smugly), "He is an Englishman; he is, therefore, brave", I have certainly committed myself, by virtue of the meaning of my words, to its being the case that his being brave is a consequence of (follows from) his being an Englishman. But while I have said that he is an Englishman and said that he is brave, *I do not want to say that I have said (in the favored sense) that it follows from his being an Englishman that he is brave*, though I have certainly indicated, and so implicated, that this is so. I do not want to say that my utterance of this sentence would be, STRICTLY SPEAKING, false should the consequence in question fail to hold.

---

[2]Alternatively, it can signal a dependence between the speakers beliefs about Fatima's cheerfulness and her being Australian. For the sake of brevity, we will assume that such an alternative reading is generally available throughout this text, rather than reminding the reader explicitly for every example.

In short, Grice suggests that claims like (2) and (3) are alike with regards to what is said (in his favoured sense). (2) and (3) only differ with regards to what they implicate and indicate; what is literally said, in Grice's favoured sense, by uttering (2) and (3) is the same. Several authors have taken this suggestion to heart and provided arguments in its favour.

Before turning to these arguments, we need at least a working conception of the distinction between what is said and what is merely indicated or implicated. As the characterisation of this distinction is the topic of a rich discussion, we will try to avoid needless controversy by introducing the notion of *core content* and characterising this notion *via negativa*. We will distinguish core content from three types of content that is taken to be merely implicated or indicated. The resulting notion will suffice to formulate and defend our preferred view on the dependence conveyed by 'therefore' constructions.

Let us start with content that is *conversationally* implicated. To use a hackneyed example due to Grice (1961, p. 129-30), suppose, when asked for a letter of recommendation for an applicant to a philosophy Ph.D. program a professor writes (4) and leaves it at that:

(4)   His handwriting is impeccable.

What the professor has literally said is that the student's handwriting is impeccable, and (4) will be true or false depending on whether his handwriting really is impeccable. But what the professor has implicated is that the student is no good at philosophy. This kind of implicature is called 'conversational' since the conversational context (a reference letter for a Ph.D. application) determines what is conveyed over and above what is literally said.

A second kind of implicated content is *conventionally* implicated content. This kind of content is taken to be implicated by broad convention, rather than the specific conversational content. Consider the following example from Potts (2007, p 667):

(5)   Bart managed to pass the test.

In (5), what is said is that Bart passed the test. The use of 'managed' conventionally implicates that Bart worked hard to pass the test. Many authors maintain

4

that the dependence conveyed by 'therefore' constructions is merely conventionally implicated as well (e.g. Grice, 1975; Potts, 2005, 2007; Neta, 2013).[3] Indeed, Potts names 'therefore' as a popular and (relatively) uncontroversial example of conventional implicature (Potts, 2007, p. 666–667).

Aside from these two kinds of implicatures, there is content that is *presupposed* rather than being part of what is said. Consider one says:

(6)　Akilah stopped going to class.

What you have literally said is that Akilah is not going to class, but you further trigger the presupposition that she used to go to class. Recently, Pavese (2017, forthcoming) and Stokke (2017) have argued that the dependence conveyed by 'therefore' constructions is presupposed, rather than being part of what is being said.[4]

In these examples we distinguished between what is literally said from what is implicated or presupposed. The core content of a sentence, as we will use the label, is just the conveyed content that remains once all conversational implicatures, conventional implicatures, and triggered presuppositions are stripped away. In this sense core content is characterised *via negativa*. We take it that this notion of core content is akin to several notions familiar from the literature, such as Grice's favoured sense of what is said (cf. supra) and Potts's descriptive content (2005; 2007). It is not of primary importance that core content fits on these notions seamlessly. However, it is sufficiently similar to characterise our view on the dependence conveyed by 'therefore' constructions and contrast it with the standard view in the literature.

The view that we will defend here can be characterised as follows:

The Core Dependence View: The dependence conveyed by 'therefore' constructions is part of the core content of those constructions.

---

[3]Although Neta (2013, p. 394 and fn. 3) seems to diverge a bit from the others by maintaining that the dependence is also asserted.

[4]Some, like Karttunen (2016), deny that conventional implicatures and triggered presuppositions can be cleanly pulled apart. Since our primary aim is to defend an alternative view, the question of the distinction between conventional implicature and triggered presuppositions need not concern us here.

By 'the dependence conveyed by a 'therefore' construction' we mean the central (typically token-token) dependence conveyed by that construction. This is important to clarify since often claims like (7) convey both a token dependence (that our belief that there is fire depends on our seeing smoke) and a type dependence (typically, smoke is caused by fire).

> (7)   We saw smoke, therefore there is a fire.

THE CORE DEPENDENCE VIEW says that the dependence conveyed is part of the core content of 'therefore' constructions like (7). THE CORE DEPENDENCE VIEW allows for type-type dependencies to be merely implicated or presupposed by 'therefore' constructions.

The principal rival of THE CORE DEPENDENCE VIEW is, predictably, THE NON-CORE DEPENDENCE VIEW.

> **THE NON-CORE DEPENDENCE VIEW:** The dependence[5] conveyed by 'therefore' constructions is not part of the core content of these constructions.

As we have seen, THE NON-CORE DEPENDENCE VIEW is widely accepted in the contemporary literature (e.g. Stokke, 2017; Pavese, 2017; Neta, 2013; Potts, 2005). According to these views, 'therefore' does not differ in its contribution to the core content from 'and'. The non-core dependence views thus entail that (2) and (3) have the same core content. We argue that the THE CORE DEPENDENCE VIEW is still a strong contender relative to such views. We will defend THE CORE DEPENDENCE VIEW against several important objections: one based on projection data and one based on judgments about falsity and direct negation.

3   Projection

The primary consideration levelled against THE CORE DEPENDENCE VIEW is based on projection data. In this section, we argue that the relevant data can be reconciled elegantly with THE CORE DEPENDENCE VIEW by adopting the general projection hypothesis defended by Simons et al. (2010) and Roberts et al. (2009),

---

[5]Again the crucial (typically token-token) dependence.

which ties projection to *at issueness*. We also point to an apparent difference between the dependence conveyed by 'therefore' constructions and standard cases of non-core content when it comes to *at issueness*. Let us start with a brief discussion of projection data and what they are supposed to show.

Some linguistic constructions create environments that are *entailment cancelling*[6] in that the truth of the overall construction does not entail the truth of the material within it. For example, if I say:

(8) It is not the case that snow is black.

The proposition I express does not entail that snow is black — quite to the contrary. This is because the 'it is not the case that' environment is entailment cancelling. Aside from negation, standard examples of entailment cancelling environments include questions, the antecedents of conditionals and modals.

(9) Is snow black?

(10) If snow is black, I will need a different camo suit.

(11) Maybe snow is black.

None of these entail that snow is black.

Non-core content, such as triggered presuppositions and conventional implicatures will often survive such cancellations. Consider the conventional implicature carried by 'managed':[7]

(12) Bart did not manage to pass the test.

(13) Did Bart manage to pass the test?

(14) If Bart manages to pass the test, he gets a new bike.

(15) Maybe Bart managed to pass the test.

None of these entail that Bart passed the test, but they *do* convey that he tried hard. The latter information is thus said to *project out* of these entailment cancelling environments.

Similar behaviour is observed with triggered presuppositions. Consider for example:

---

[6]Environments of this kind are also known as *nonveridical* environments (cf. Zwarts, 1995).

[7]The following four examples are variations of those given by Potts (2007, p 667). See also Karttunen and Peters (1979, p. 14) for a detailed analysis of 'managed' in entailment cancelling environments.

(16) Akilah did not stop going to class.

(17) Did Akilah stop going to class?

(18) If Akilah stops going to class, she loses her allowance.

(19) Maybe Akilah stopped going to class.

None of these entail that Akilah stopped going to class, but they *do* convey that she used to attend class regularly. Again, the latter information projects out of these entailment cancelling environments.

We can highlight this projection behaviour by considering the pairs such as:

(20) Akilah didn't stop going to class. #She never went to class.

(21) Akilah didn't stop going to class. She showed up every morning, much against her will.

The second part of (20) seems to be in tension with the first part while there is no such tension between the parts of (21). This indicates that the information that Akilah used to attend class regularly is not part of the core content of those constructions.

Defenders of THE NON-CORE DEPENDENCE VIEW note that the dependence conveyed by 'therefore' can project out entailment cancelling environments as well. For example, Stokke (2017, p. 138) remarks that the following sentences all have readings on which the conveyed dependence projects out of the entailment cancelling environments:

(22) It's not the case that the supply of oil will decrease and therefore prices will increase.

(23) If the supply of oil decreases, and therefore oil prices increase, we'll see more investment in solar power.

(24) Will the supply of oil decrease and therefore oil prices increase?

That is to say, these can be read as conveying that the oil prices depend on oil supply, whereas they cannot be read as conveying that the supply decreased or that the prices increased. If we pursue the line of thought underlying THE NON-CORE DEPENDENCE VIEW, a similar reading is available of 'therefore' construction in environments created by modal constructions, such as:

(25) Maybe the supply of oil decreased and therefore the oil prices increased.

On such a projective reading, the speaker is not committed to there being either a decrease of oil supply or an increase of oil prices, but she does commit herself to there being some dependence between the two. [8]

Given that core content typically does not project out of such environments, shown by (8) – (11), and non-core content typically projects out of such environments, as is shown by (12) – (19), the above cases of embedded 'therefore' construction can be taken to indicate that the dependence conveyed by these constructions is not part of their core content. And indeed, Neta (2013), Potts (2005), Pavese (2017, forthcoming) and Stokke (2017) take this lesson from the projection data.

Unsurprisingly, we favour a different explanation of therefore's projection behaviour. Following the general hypothesis about projection behaviour proposed by Roberts et al. (2009) and Simons et al. (2010), we suggest that the dependence conveyed by 'therefore' construction sometimes projects out of entailment cancelling environments because the dependence can fail to be *at issue*. Given that core content can fail to be at issue, our proposed explanation of the projection data is compatible with THE CORE DEPENDENCE VIEW. This line of reasoning requires some unpacking.

Let us start with the general projection hypothesis proposed by Roberts et al. (2009) and Simons et al. (2010):

General Projection Hypothesis All and only the not-at-issue content of a constituent projects, given an appropriate context of utterance. (Roberts et al., 2009, p. 6)

This hypothesis ties projection behaviour to *at-issueness*. Roughly speaking, content can be said to be 'at issue', only when it helps to address the question under discussion and the question under discussion is the implicit or explicit question that guides conversation.

---

[8] Although Stokke does not rely on the example of modal environments in his 2017 article, he confirmed that he finds this a plausible reading in personal communication.

Given that the core content of our words is at least to some extent independent of our conversational goals, core content and at-issueness can come apart (cf. Simons et al., 2010, sect. 7).[9] The core content of the same words can be at issue relative to one conversational context, but non-at-issue relative to another. To see this, consider the following pair:

(26) **Q1**: Is your brother in town again?

A1: He rocked up yesterday in a shabby, blue Corvette.

(27) **Q2**: How did your brother make it all the way here?

A2: He rocked up yesterday in a shabby, blue Corvette.

In (26), 'he rocked up yesterday' is at issue, but 'in a shabby, blue corvette' is not, even though they are both part of the core content. In (27), 'he rocked up yesterday' is not at issue, but 'in a shabby, blue Corvette' is. Although the core content is identical for **A1** and **A2**, what is at issue differs.

These examples demonstrate that core content can fail to be at issue.[10] If THE GENERAL PROJECTION HYPOTHESIS is correct, this opens up the possibility that the dependence conveyed by 'therefore' construction is part of their core content, even though this content sometimes projects out of entailment cancelling environments. After all, *all* not-at-issue content projects out according to THE GENERAL PROJECTION HYPOTHESIS

The projection behaviour of 'therefore' construction can, in fact, be used to illustrate the initial plausibility of the THE GENERAL PROJECTION HYPOTHESIS. If this hypothesis is correct, we should expect that the dependence conveyed by therefore does not project out of entailment cancelling environments when the relevant dependence itself is at issue. This is in fact what we observe.

---

[9]This is not to say that core content never interacts with the question under discussion. For example, Schoubye and Stokke (2016) argue that core content can be enriched by the question under discussion.

[10]A note on terminology: 'at issue content' or 'at issueness' is used in a variety of ways in the literature. Some of these uses match more closely with our use of 'core content' than our use of 'at issue content', and some use 'core content' and 'at issue content' interchangeably Pavese (e.g. 2017, p. 89). We follow the use presented in Simons et al. (2010), which allows at issue content and core content to come apart.

(28) **Q**: The recent increase in oil prices are a scandal and evidence the sheer incompetence of our current administration.

A: What makes you think it's their fault? Maybe the oil supply decreased and therefore the prices increased.

Although **Q**'s utterance seems to presuppose that there is some type-level regularity between oil prices and oil supply, it does not presuppose that the current increase in oil prices follows from a decrease in supply. That is to say, the (token-token) dependence conveyed in this case does not project out of the entailment cancelling environment created by the modal. Instead, the 'maybe' modal targets the (token-token) dependence conveyed by therefore; **A** portends that the price increase may be *due to* a supply decrease.

A similar pattern can be observed for other entailment cancelling environments. If the dependence is at issue, it tends not to project out. Consider for instance the following examples, where the dependence is at issue and subsequently does not project:

(29) Sure, Bill gave up drinking, but is he therefore a better person?

(30) If Geoffrey is getting too little sunlight and is therefore getting depressed, he should really consider a holiday in Argentina.

(31) **Q**: Do you think Geoffrey's cheerfulness is due to low exposure to sunlight?

A: Sure, he has not seen the sun in weeks and he has been awfully cheerful. But it is not that he has been living in the dark and he is therefore cheerful. Frankly, I think he is in love.

(29) questions whether it follows from Bill's quitting that he is a better person, in (30) the truth of the consequent is conditional on Geoffrey's depression being due to a low exposure to sunlight, and in (31), **A** denies that Geoffrey's cheerfulness is due to his living in the dark.

Together with (22) – (25), (28) – (31) corroborate the GENERAL PROJECTION HYPOTHESIS. In (22) – (25) it is unclear whether the dependence is at issue and

projective readings are available. In (28) – (31) the dependence appears to be at issue and a non-projective reading suggests itself. This indicates that projection behaviour is tied to at-issueness rather than the core content/non-core content distinction. If this is true, these projection data on their own do not yield a reason to reject THE CORE DEPENDENCE VIEW.

Perhaps the opponents of THE CORE DEPENDENCE VIEW can still build a case on projection behaviour by taking into account a broader array of data. Even if projection is primarily tied to at-issueness, it might still be the case that the conveyed dependence mirrors the projection behaviour of non-core content in a broad variety of cases. One might take this as evidence that the dependence conveyed by 'therefore' construction is not part of the core content of these constructions.

It is up to the opponents of THE CORE DEPENDENCE VIEW to produce such data, but we should note a preliminary difficulty for this strategy. In general, non-core content such as conventional implicatures and triggered presupposition are difficult to make at issue, and attempts to do so often result in infelicity (cf. Simons et al., 2010, p. 322).[11] As we have seen, the dependence conveyed by 'therefore' constructions can be at issue in certain contexts, and in those contexts this dependence does not project out of entailment cancelling environments. This effect is hard to imitate with standard cases of non-core content. Attempts to answer the question under discussion with non-core content of clauses in entailment cancelling environments often result in infelicity rather than stopping the projection behaviour:

(32) **Q1**: Did Carmen have any unhealthy habits?
     A1: # Maybe she stopped smoking.

(33) **Q2**: Did Bart work hard for the test?
     A2: # Maybe he managed to pass the test.

The use of 'stopped' in **A1** conveys that Carmen used to smoke and this conveyed information directly answers **Q1**. Even so, this seemingly at-issue information projects out of the entailment cancelling environment created by

---

[11]We set aside conversational implicatures here, as none of the defenders of THE NON-CORE DEPENDENCE VIEW hold that the dependence is conveyed by conversational implicature.

'maybe' and the overall utterance is infelicitous. In (33), the conventional implicature that Bart worked hard for the test directly answers **Q2**. Here too, this content still projects out of the modal environment and the overall utterance is infelicitous. Unlike the dependence conveyed by 'therefore' constructions, the non-core content in these cases cannot simply be stopped from projecting out by making it at issue. Instead, attempts to answer the question under discussion with these standard examples of non-core content often result in infelicity.[12]

One might worry that this spells trouble for THE GENERAL PROJECTION HYPOTHESIS. (32) and (33) appear to be cases in which at-issue content fails to project. However, the projection hypothesis makes no claims about what kind of content *can* be at issue. In particular, THE GENERAL PROJECTION HYPOTHESIS leaves it open that non-core content such as triggered presuppositions and conventional implicatures is earmarked for non-at-issueness and is therefore difficult to render at issue felicitously. We refer to Simons et al. (2010, p. 319–322) for a more elaborate discussion of this point. For our purposes, the takeaway is that, rather than bearing out a similarity between the dependence conveyed by therefore and non-core content in standard cases, the interaction between at-issueness and projection appears to reveal a contrast between the dependence content conveyed by 'therefore' constructions and familiar instances of non-core content: the conveyed information about dependence can easily be used to address the question under discussion felicitously, whereas familiar kinds of non-core content are resistant to such use.

In summary, the projection data presented in support of THE NON-CORE DEPENDENCE VIEW does not establish the falsity of THE CORE DEPENDENCE VIEW and the interaction between at-issueness and standard non-core content in fact supports THE CORE DEPENDENCE VIEW. All in all, the projection behaviour of therefore appears to be compatible with THE CORE DEPENDENCE VIEW.

---

[12]Admittedly, this is not always the case; see Abbott (2006, p. 11) for examples. Proponents of THE NON-CORE DEPENDENCE VIEW might argue that non-projective readings of 'therefore' fit with such known cases of non-projecting non-core content. We leave a further exploration of such a strategy to those proponents. Again, our primary aim here is to demonstrate that THE CORE DEPENDENCE VIEW fits the data, and we do not pretend to establish that its competitors do not fit the data.

4 Falsity and Direct Negation

Another popular reason to reject THE CORE DEPENDENCE VIEW is judgements about falsity and direct negation. Opponents of THE CORE DEPENDENCE VIEW often maintain that claims involving 'therefore' cannot be false merely in virtue of the conveyed dependence not holding.

For example, Stokke (2017, p. 133) maintains that it is not clear that one is lying if one utters (1), when both the switch in the hall and the lights in the office are on, but one knows full well that these two facts are not related:

(1) The switch in the hall is on, and therefore the lights in the office are on.

He goes on to compare this case with standard cases of presupposition failure, such as uttering (34) when one knows full well that Jim has never been drinking (Stokke, 2017, p. 142):

(34) Jim has stopped drinking.

According to Stokke, (1) and (34) are not false in these contexts.[13] They are merely deceptive.[14]

In a similar vein, Pavese (2017, p. 88–89) calls claims like (1) 'weird-sounding' rather than false and maintains that they are not the proper target of direct negation. For example, she judges the following sequence to be infelicitous, because **B** attempts to directly deny the dependence conveyed by **A**'s utterance (Pavese, 2017, p. 89):

(35) **A**: Mark is an Englishman, and he is, therefore, brave.
      B: # That is false.

These intuitions about falsity and direct negation pose a challenge for THE CORE DEPENDENCE VIEW. Typically, utterances with false core content are judged to be false *simpliciter* and are the proper target of direct negation. Consider:

(36) **A**: Snow is black.
      B: That is false.

---

[13]See also Grice (1975, p. 45), who maintains such cases are not 'strictly false' (cf. supra).

[14]See Viebahn (forthcoming) for an argument to the extent that one *can* lie with presuppositions.

There is no doubt that **A** says something false (rather than just 'weird-sounding') and that **B**'s direct denial is felicitous.

We agree that these intuitions are an important explanandum and we will argue that they can be explained without giving up on THE CORE DEPENDENCE VIEW. Before doing so however, we should note that many others have reported the opposite intuition. McCawley (1993), Bach (1999, p. 330), Neale (1999) and Horn (2013) all report that the dependence conveyed by 'therefore' can be properly targeted for direct negation.[15] In line with these judgments, we judge that utterances of (37) are *false*, rather than merely weird-sounding or deceptive, and are typically the proper target of direct negation

(37)   12 is a number, therefore 12 is even.

We report similar intuitions about cases like (1) and (35) in contexts where the relevant dependence fails to hold. To our ears, there is nothing wrong with targeting the dependence conveyed by therefore with a direct negation.[16]

Moreover, we take direct negation to point towards another difference between the dependence conveyed by 'therefore' constructions and standard cases of non-core content. By directly denying or affirming a statement, one is typically taken to acquiesce in the non-core content carried by that statement. For example, when responding to questions like

(38)   Did Bart manage to pass the test?
(39)   Has Akilah stopped going to class?

One cannot respond with either 'yes' or 'no' without acquiescing in the presupposition that Bart worked hard or that Akilah used to attend class. One has to step back to target the relevant non-core content. For instance you could reply 'wait a minute, she never attended class!' or 'what do you mean? She never attended class!'.

---

[15]Remarkably, neither Pavese (2017, Forthcoming) nor Stokke (2017) engage with this work and only present the NON-CORE DEPENDENCE intuition as the relevant data concerning direct negation.

[16]Admittedly, direct negation will be awkward when the reported dependence is a doxastic one (i.e. a dependence between beliefs), but this is plausibly due to a general awkwardness about directly negating self-directed statements about doxastic attitudes. Consider the following interaction: "**A**: I believe the lights in the office are on. **B**: # No you don't."

But by answering 'no' to (40) one does not thereby acquiesce in the claim that Fatima's cheerfulness depends on her being Australian, or at least such is our intuitive judgment.

(40)   Fatima is Australian. Is she therefore cheerful?

It seems to us that one can simply reply 'no' without either denying that she is Australian or denying that she is cheerful. If it is true that the dependence is often the appropriate target of direct negation, then THE CORE DEPENDENCE VIEW can neatly explain why that is; it is the appropriate target of direct negation because it is part of the core content of the sentence.

A natural response from the NON-CORE DEPENDENCE camp is to maintain that these direct negations are *metalinguistic* negations. That is to say, they may target the appropriateness of the use of the word 'therefore' instead of 'and' or 'also', without targeting the core content of the utterance. Such metalinguistic uses of direct negation are familiar from cases like (41), where the appropriateness of 'manage' is disputed because it carries the presupposition that John invested serious effort (Horn, 1985, p. 130):

(41)   John didn't MANAGE to solve some problems. He was
        given the answers.

Pavese (forthcoming, p. 14, fn 11) remarks that direct *metalinguistic* negation of the dependence conveyed by 'therefore' constructions is compatible with that dependence being a triggered presupposition. On such a view, the 'no' in response to faulty 'therefore' claims like (40) is of a kind with the 'didn't' in (41): it targets the word-choice rather than the truth value.

The exploration of this line on behalf of the NON-CORE DEPENDENCE VIEW will have to be left for future work. Again, our primary concern is not whether NON-CORE DEPENDENCE VIEWS can be made to fit the data. However, we should note that the dependence conveyed by 'therefore' can be directly negated in a variety of ways. For example, Horn (2013, p. 180), referencing Ward (2003), remarks that the exclamation 'Bullshit!' can target the conveyed dependence, but typically cannot target non-core content like the tension conveyed by 'but':[17]

---

[17]These data are all the more pressing for Pavese (2017, forthcoming) and Stokke (2017), as they present the tension elicited by 'but' as a running example for a triggered presupposition.

(42) A: "Her name is Caroline. She's an Italian girl but she's pretty."

B: # "Bullshit, Ma." Frank said. "Why not 'and she's pretty'?"

(43) A: Lance loves musical comedies and has seen "Mamma Mia" twice.

He is, therefore, gay.

B: Bullshit. That doesn't follow.

Although Horn admits that the intuitions are not always clear-cut, calling bullshit typically targets the truth value, rather than the choice of words or non-core content.[18] Examples like (43) thus suggest that the dependence conveyed by therefore can be targeted for direct, descriptive negation.

It can thus appear that we are stuck in an intuition deadlock. Some report intuitions that lend support to THE NON-CORE DEPENDENCE VIEW, and others report opposite intuitions that directly support THE CORE DEPENDENCE VIEW. Rather than merely locking horns on intuitions, we propose to explain this divergence in intuitions by again relying on THE GENERAL PROJECTION HYPOTHESIS.

As we've seen, THE GENERAL PROJECTION HYPOTHESIS predicts that the conveyed dependence in 'therefore' constructions is projective if and only if it is not at issue. As noted by Roberts et al. (2009), projective content is typically not the proper target of direct negation. If this is true, it should come as no surprise that intuitions about 'therefore' constructions diverge when presented without further context to provide clues as to which question is under discussion. Some readers are likely to be more inclined than others to fill in the contextual details such that the relevant dependence is at issue, and how one is inclined to fill in these contextual details will affect one's judgements about these cases. We can give this tentative explanation a test run by considering 'therefore' claims in different contexts again. For a direct negation-friendly case, recall (28):

(28) **Q**: The recent increase in oil prices are a scandal and evidence the sheer incompetence of our current administration.

---

[18]See Horn (2014, p. 125–126) and Horn (2018, p. 30–31) for more on the Bullshit test.

> **A**: What makes you think it's their fault? Maybe the oil supply decreased and therefore the prices increased.

For a contrast, consider:

(44) **Q**: Do you think Mark will hold his own?
A: Don't worry. Mark is an Englishman, and he is, therefore, brave.

Although our Core Dependence View intuitions linger, we can see how **A** would be a less clear example of a lie in (44) than in (28) — assuming of course, that in both cases the speaker knows full well that the dependence does not hold. In (44), Mark's bravery is at issue, but the reasons for his bravery are not. Consequently, a direct negation is intuitively read as targeting this bravery. In (28) by contrast, the origin of the oil price increase is what is at issue and a direct negation is intuitively interpreted as targeting the conveyed dependence.[19]

The question of falsity and direct negation gives rise to conflicting judgements about 'therefore' claims. Consequently, these do not univocally favour or disfavour The Core Dependence View. However, we can explain this divergence by pointing to different possible ways of filling in the question under discussion. There is potential for further research here. Surveys could be used to map judgements about these cases. Perhaps the question under discussion indeed tracks the acceptability of direct negation, or perhaps they tend to favour (Non-)Core Dependence intuitions across the board. For now, we conclude that the diverging judgements reported in the literature can be captured by The Core Dependence View with the help of The General Projection Hypothesis.

5 Context Sensitivity

Pavese (2017, p. 90) claims that understanding the dependence conveyed by 'therefore' constructions as being conveyed via a presupposition trigger helps

---

[19]Though his proposal does not rely on The General Projection Hypothesis, Neale (1999, p. 57–60) provides a similar explanation of the conflicting intuitions in direct negation cases. Horn (2013, p. 155–156) also suggests such a view of appositives and non-restrictive relative clauses.

to " [. . .] predict and to account for the remarkable context-sensitivity of 'therefore'-sentences". This consideration might give us reason to prefer the presupposition-based conception of how the dependence is conveyed by 'therefore' constructions over a Potts-style conventional implicature view as Pavese suggests. However, it does not give us reason to prefer the presupposition-based view over THE CORE DEPENDENCE VIEW.

This is because context sensitivity at the level of core content is extremely common. For instance, contextualist treatments of knowledge (Lewis, 1996), counterfactuals (Lewis, 1973; Lewis, 2016; Sandgren and Steele, 2020), absolute gradable adjectives (Kennedy, 2007), and causation (Hitchcock, 1996; Menzies, 2004) are common, powerful, and attractive. It is very plausible that the core content of 'therefore' constructions is context sensitive in the same way. After all, 'therefore' constructions (much like 'because' constructions) are often tied to explanation (especially when they are answers to 'why' questions) which is plausibly context sensitive (for an excellent discussion of this point, see Jenkins (2008)).

While attempting to highlight the ability of her view, according to which the dependence conveyed in 'therefore' constructions is presupposed, Pavese (2017, p. 90) uses an example in which we are conducting an experiment on a group of people all of whom are either progressive or not from the north, and we know this. We also know Mark is part of that group. In this case, (45) is both true and felicitous.

(45)   Mark is a progressive and he is, therefore, from the North.

However, this is no reason to prefer Pavese's view over the CORE DEPENDENCE VIEW since the latter predicts that (45) is true and felicitous in this context as well. In particular, there is an explanatory dependence that (45) conveys and *in this context* that dependence holds. While, generally speaking, being from the North does not depend on being progressive, this dependence does hold for the specific set of people that we, in the local conversational context, know Mark to be selected from. This knowledge, together with the knowledge that Mark is a progressive, justifies the inference that he is from the North.

We contend that there is no reason to suppose that the core content of

'therefore' constructions is not context sensitive. It is beyond the scope of this paper to develop a more fully worked out contextualist account of therefore, but context-sensitivity does not provide a strong reason to reject THE CORE DEPENDENCE VIEW.[20]

6 Conclusion

We have defended a view on the dependence conveyed by 'therefore' constructions; the view that this dependence is part of the core content of such constructions. The central piece of evidence presented against this view is that the dependence sometimes projects out of entailment cancelling environments. We argued that the projection data involving 'therefore' constructions in fact suggest a more complicated picture of the relationship between projection and core-content: the dependence projects out of such environments just when it is not at-issue. Crucially, this allows that the projective content is sometimes part of the core content. Further evidence levied against THE CORE DEPENDENCE VIEW can be accommodated as well. The diverging intuitions concerning falsity and direct negation can be explained by relying on at-issueness, and context-sensitivity does not typically distinguish between core content and non-core content. All in all, we have argued that THE CORE DEPENDENCE VIEW is at least as plausible as its principal rivals and has been underappreciated in the recent literature.

---

[20]Jenkins (2008) has done some promising groundwork for a contextualist treatment of 'therefore' constructions in her discussion of related expressions like 'why' and 'wherefore'.

References

Abbott, B. (2006). Where have some of the presuppositions gone. *Drawing the boundaries of meaning: Neo-Gricean studies in pragmatics and semantics in honor of Laurence R. Horn 80*, 1–20.

Bach, K. (1999). The myth of conventional implicature. *Linguistics and Philosophy 22*(4), 327–366.

Grice, H. P. (1961). The causal theory of perception. In J. Dancy (Ed.), *Aristotelian Society Supplementary Volume*, pp. 121–168. Oxford University Press.

Grice, H. P. (1975). Logic and conversation. In M. Ezcurdia and R. J. Stainton (Eds.), *The Semantics-Pragmatics Boundary in Philosophy*, pp. 41–58. Broadview Press.

Hitchcock, C. R. (1996). The role of contrast in causal and explanatory claims. *Synthese 107*(3), 395–419.

Horn, L. (2014). Information structure and the landscape of (non-) at-issue meaning. In *The Oxford handbook of information structure*.

Horn, L. R. (1985). Metalinguistic negation and pragmatic ambiguity. *Language*, 121–174.

Horn, L. R. (2013). I love me some datives: Expressive meaning, free datives, and f-implicature. In *Beyond expressives: Explorations in use-conditional meaning*, pp. 151–199. Brill.

Horn, L. R. (2018). An (abridged) atlas of negation: polar landscape in an era of climate change. In *Pragmatics, Truth and Underspecification*, pp. 3–53. Brill.

Jenkins, C. S. (2008). Romeo, René, and the reasons why: What explanation is. *Proceedings of the Aristotelian Society 108*(1), 61–84.

Karttunen, L. (2016). Presupposition: What went wrong? In *Semantics and Linguistic Theory*, Volume 26, pp. 705–731.

Karttunen, L. and S. Peters (1979). Conventional implicature. In C.-K. Oh and D. A. Dinneen (Eds.), *Syntax and Semantics 11, Presupposition*, pp. 1–56. Academic Press, New York.

Kennedy, C. (2007). Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy 30*, 1–45.

Lewis, D. K. (1973). *Counterfactuals*. Blackwell.

Lewis, D. K. (1996). Elusive knowledge. *Australasian Journal of Philosophy 74*(4), 549–567.

Lewis, K. S. (2016). Elusive counterfactuals. *Noûs 50*(2), 286–313.

McCawley, J. (1993). *Everything linguists always wanted to know about logic*. Chicago University Press.

Menzies, P. (2004). Difference-making in context. In J. Collins, N. Hall, and L. Paul (Eds.), *Causation and Counterfactuals*. MIT Press.

Neale, S. (1999). Coloring and composition. In K. Murasugi and R. Stainton (Eds.), *Philosophy and Linguistics*, pp. 35–82. Westview Press.

Neta, R. (2013). What is an inference? *Philosophical Issues 23*(1), 388–407.

Pavese, C. (2017). On the Meaning of 'Therefore'. *Analysis 77*(1), 88–97.

Pavese, C. (forthcoming). Lewis carroll's regress and the presuppositional structure of arguments. *Linguistics and Philosophy*.

Potts, C. (2005). *The Logic of Conventional Implicatures*. Oxford University Press.

Potts, C. (2007). Into the conventional-implicature dimension. *Philosophy Compass 2*(4), 665–679.

Roberts, C., M. Simons, J. Tonhauser, and D. I. Beaver (2009). Presuppositions, conventional implicature, and beyond: A unified account of projection.

Sandgren, A. and K. Steele (2020). Levelling counterfactual scepticism. *Synthese 1*, 1–21.

Schoubye, A. J. and A. Stokke (2016). What is said? *Noûs 50*(4), 759–793.

Simons, M., J. Tonhauser, D. Beaver, and C. Roberts (2010). What projects and why. In *Semantics and linguistic theory*, Volume 20, pp. 309–327.

Stokke, A. (2017). II—Conventional Implicature, Presupposition, and Lying. *Aristotelian Society Supplementary Volume 91*(1), 127–147.

Viebahn, E. (forthcoming). Lying with presuppositions. *Noûs*.

Ward, G. (2003). Comments on 'Felicity and presupposition triggers' by Michael Glanzberg. Linguistics & Philosophy Workshop, Ann Arbor.

Zwarts, F. (1995). Nonveridical Contexts. *Linguistic Analysis 25*, 286–312.