**Non-philosophers’ Judgements of Metaphysical Explanations are Context-Sensitive**

**Abstract**

Empirical investigation of the conditions under which people prefer, or disprefer, causal explanation, has suggested to many that our judgements about what causally explains what are context-sensitive in a number of ways. This has led many to suppose that whether or not a causal explanation obtains depends on contextual factors: that causal explanation is context-sensitive. Surprisingly, most accounts of metaphysical explanation, by contrast, suppose it to be context insensitive. Only recently have accounts been developed of metaphysical explanation on which it is context-sensitive. To date, however, there is no empirical evidence about the context sensitivity of metaphysical explanation. In what follows we test the judgements of non-philosophers, and find that amongst non-philosophers, at least, metaphysical explanations are context-sensitive. We then consider the implications of this finding for theorising about metaphysical explanation.

**Introduction**

Let’s call a judgement about which things *metaphysically explain* which other things a judgement of the form ⌜x *because* y⌝,[[1]](#footnote-1) where ⌜x⌝ and ⌜y⌝ are sentences, and *‘because’* expresses a particular kind of explanatory connection (i.e. one that is metaphysical rather than causal).[[2]](#footnote-2) Then paradigmatic instances of judgements of this kind include the judgement that the Lego brick is red *because* it’s maroon; that the whole exists *because* the parts exist (and are arranged thus and so); that the singleton set {Gibbard} exists *because* Gibbard exists, and so on. Many suppose that metaphysical explanations are true propositions of the form ⌜x *because* y⌝[[3]](#footnote-3) and in what follows, for simplicity we make this assumption.

Then it is often held that instances of ⌜x *because* y⌝ are true only if there is a pair of facts (understood as structured parts of the world comprised of objects, properties and relations) [x][[4]](#footnote-4) and [y], such that [x] obtains iff the sentence x, is true, and [y] obtains iff only sentence y, is true, and each fact is in some good sense what the relevant sentence is *about*, or what makes the sentence true,[[5]](#footnote-5) and a particular explanatory connection obtains between [y] and [x].[[6]](#footnote-6)

One popular approach, which we call a *grounding-approach*,[[7]](#footnote-7) is to suppose that the explanatory connection which must obtain between [y] and [x] in order for ⌜x *because* y⌝ to be true is the relation of grounding.[[8]](#footnote-8) Then, say, ‘{Gibbard} exists *because* Gibbard exists’ is true only if [Gibbard exists] grounds [{Gibbard} exists]. The question then arises as to what else, if anything, might be required in order for a proposition of the form ⌜x *because* y⌝ to be true.

A fairly natural thought is that if something else is indeed required, then that something will involve the psychological-cum-epistemic[[9]](#footnote-9) states of relevant individuals. After all, it is natural to think that explanations are things that increase understanding, or make some phenomenon intelligible, or answer some ‘why’ question (van Fraassen 1980). Insofar as explanations are thought to perform any of these roles, it appears that whether there is an explanation present for an individual will depend both on whether that explanation induces certain psychological-cum-epistemic features in that individual, and on whether it answers the individual’s ‘why’ question. In light of these sorts of broad considerations, Thompson (2016) and Maurin (2018) have argued that we should expect metaphysical explanations to be subjective and agent-relative.

Say that metaphysical explanation is *agent-relative* iff instances of ⌜x *because* y⌝ are always true, or false, relative to some individual and are *agent-neutral* iff they are not agent-relative. Say that metaphysical explanations are *context-sensitive* just in case whether an instance of ⌜x *because* y⌝ is true, depends on features of an individual’s context[[10]](#footnote-10), and are *context-insensitive* just in case they are not context-sensitive. We take it that if metaphysical explanations are context-sensitive, then since context varies across agents they are also very likely to be agent-relative (or at least, relative to agents-at-times) so in the remainder of the paper we focus predominantly on context-sensitivity.

One way for metaphysical explanations to be context-sensitive is if they are *subjective*, where metaphysical explanations are subjective iff whether an instance of ⌜x *because* y⌝ is true depends on the mental states of relevant individuals. Say that metaphysical explanations are *objective* iff they are not subjective. Since one aspect of an individual’s context are their mental states, one way metaphysical explanations can be context-sensitive is if they are subjective. But metaphysical explanations can be context-sensitive even if they are not subjective. Other, non-mental, aspects of an individual’s context might determine whether an instance of ⌜x *because* y⌝ is true. So, if metaphysical explanations are context-insensitive then they are objective, though the converse does not hold.

A number of authors have recently taken seriously the task of providing an account of metaphysical explanation on which it is context-sensitive.

Dasgupta (2017) defends what he calls *anti-realism* about metaphysical explanation: the view that what metaphysically explains what is relative to our interests and concerns, which in turn “may vary from culture to culture or time to time” (p. 78). According to Dasgupta’s preferred anti-realist picture “two cultures might offer conflicting [metaphysical] explanations and yet there may be no fact of the matter who is “really correct”: each explanation may be correct relative to their respective interests and concerns.” (p. 89).

Thompson (2019) develops a context-sensitive account of metaphysical explanation on which metaphysical explanations are answers to a certain kind of why-question: a ‘what-makes-it-the-case-that’ question. Whether or not an utterance counts as a metaphysical explanation, for Thompson, depends on “epistemic constraints imposed by the context in which a relevant question is asked” (p.98). In particular, in order to be a candidate metaphysical explanation, the answer must be a reasonable, proportionate, intelligible, and relevant answer to the given why-question. In order to be a metaphysical explanation, there must also be a “metaphysical relation between (the contents of) the explanans and the explanandum.” (p. 105). On this view, whether something counts as a metaphysical explanation *for an individual at a context* depends in part on the goals and capacities of that individual.

A rather different approach is advocated by Norton & Miller (2019), who defend what they call a psychologistic theory of metaphysical explanation. According to this view, an instance of ⌜x *because* y⌝ is true *for an individual* just in case ⌜y⌝ is true, ⌜y⌝ entails ⌜x⌝ and the *community in which that individual is embedded* is disposed to have certain beliefs about what metaphysically explains what, after engaging in a complicated process of group deliberation.

By and large, though, defenders of grounding-based approaches to metaphysical have had little to say about the psychological-cum-epistemic element (if any) of metaphysical explanation. Some authors have not only concluded that metaphysical explanations are objective and agent-neutral, but, moreover, have supposed that metaphysical explanations have no epistemic or psychological implications, at least in the sense that they have supposed that the presence of a metaphysical explanation does not entail that there are any psychological-cum-epistemic features present.[[11]](#footnote-11)

In what follows, our aim is to probe non-philosophers’ judgements about the conditions under which there is a metaphysical explanation present, to see whether there is evidence that, at least for non-philosophers’, metaphysical explanation is context-sensitive.

We probe the judgements of non-philosophers because we follow most contemporary metaphysicians in supposing that judgements about metaphysical explanation are common, and extend well outside distinctively philosophical discourse. Schaffer (2009:375), for instance, makes the case that this kind of explanation is “a natural and intuitive notion, for which there exist clear examples, and clear formal constraints.” Dasgupta (2017:74-76) similarly argues that metaphysical explanation is “intuitive and familiar, and at the same time useful in framing a number of philosophical debates” and that “examples are ubiquitous. Why is a faculty meeting occurring? Because the faculty are gathered in a room discussing matters of importance to the department, etc. Why is this water hot? Because its mean kinetic energy is high. Why have I lost this game of chess? Because my king is in check-mate.” Indeed, it is “*an everyday concept used by the masses*. When I explain the concept to non-philosophers they recognize it immediately and talk intelligibly about it, offering examples of [metaphysical] explanations in their own fields of biology, economics, journalism, or cooking. To them it is not a new concept.” Glazier (2020:121) notes that “[f]or its enthusiasts, [metaphysical] explanation is both ubiquitous in ordinary life and central to many of philosophy’s biggest questions”.

So while we make no assumption that non-philosophers are able to articulate their concept of metaphysical explanation, we do assume that they can *use* that concept to determine whether a description is one in which there is a metaphysical explanation for some (or all) parties. That is how the study that we outline proceeds. We return, in the discussion, to reflect on what evidence about the judgments of non-philosophers might tell us about the phenomenon of metaphysical explanation.

Our aim in this paper, then, is a modest one: to determine whether there is evidence that non-philosophers’ judge metaphysical explanations to be context-sensitive.

We begin, in §2, by outlining some of the plentiful empirical research into people’s (also non-philosophers’) judgements about causal explanations, and use this to motivate the study whose methodology we describe in §3. Then in §4 we present our analyses and results, before discussing these results in §5.

**2 Empirical Background**

There is quite a bit of empirical research on whether people judge causal explanations to be context-sensitive or agent-relative, but none that focuses on our judgements about metaphysical explanations. We cannot hope to summarise the former research here: instead, we aim to give a brief overview of some of the notable findings that can guide the generation of hypotheses regarding metaphysical explanations.

Very generally, there is wide ranging evidence that individuals differently prefer, or disprefer, different putative causal explanation depending on features of context. At the cultural level such factors include whether the culture of which the individual is a member emphasises individualism or collectivism (Triandis 1995; 1996; Nisbett 2003) and the goals of the members of the culture, in particular the ways in which they structure their engagement with the physical world in order to attain food and shelter (Medin & Atran 2004; Keil 2006).

Evidence also shows that between culturally similar individuals, the kinds of causal explanation offered, and the perceived quality of those explanations, varies according to context. These contextual factors include the beliefs of the explainer and the individual being offered the explanation (see Hilton 1990; Pennington & Hastie 1993; and Vlach & Noll 2016), as well as background conditions (Chin-Parker and Bradner 2010). For instance, a study conducted by Hoyos and Gentner (2017) showed that access to an analogous comparison class impacted the causal explanation participants generated of their observations. Similar work by Chin-Parker and Bradner (2010) showed that by manipulating participants’ exposure to a novel domain (the behaviour of animated, oddly-shaped, colourful objects)—and thus the background from which participants offer and evaluate explanations—they could influence whether, when asked for an explanation, participants would offer a causal or functional explanation.

We also know that people are inclined to prefer the (putative) explanation that is most salient at the context (Hilton and Slugoski 1986; Knobe 2009; Hitchcock and Knobe 2009; Kahneman & Miller 1986). In turn, salience can be the product of a number of different factors. Sometimes a (putative) causal explanation is more salient when it appeals to causal factors that are in some way abnormal: to causal factors that do not typically occur and hence which stand out. Sometimes salience is the product of practicality. It has been shown that people are more likely to prefer those (putative) causal explanations that afford them practical control. So, for instance, people are more likely to prefer causal explanations that appeal to causal factors over which they have control, to those that appeal to causal factors over which they have no control (Hitchcock and Knobe 2009). Further, studies have shown that different kinds of explanations are evaluated according to their perceived usefulness to the evaluator in facilitating the performance of upcoming tasks (Vasilyeva, Wilkenfeld, and Lombrozo 2017). This could, in part, be a function of those explanations being more salient at those contexts. Similar considerations might explain why, as van Fraassen (1980) influentially argued, explanatory judgements are highly sensitive to which contrast class is identified (for empirical support see McGill 1989; and Hilton & Erb 1996). Sometimes salience is the product of background beliefs and expectations. Evidence shows that people are more likely to find prefer causal explanations when those explanations accord with their expectations about what explains what (Hitchcock and Kobe 2009; Kahneman and Miller 1986) and cohere with their existing set of explanations (Murphy & Medin 1985; Mackonis 2013; Chapman & Chapman 1969).

Notably, when all these factors (background knowledge etc.) are held fixed, judgements of the quality of causal explanations are relatively stable (see Kelemen, Rottman, & Seston 2013; and Lombrozo 2007)).

While we think there this evidence gives us reason to predict that there will be cultural differences between individual’s judgements about metaphysical explanations, predicting which cultural differences can be expected to correlate with which differences is difficult. For that reason, this study sets aside cultural differences and focuses on differences arising from different contexts within a culture.

In light of evidence regarding people’s judgements about causal explanations, it is plausible to hypothesise that people will prefer (putative) metaphysical explanations that are useful to them, or which afford them understanding, illumination, or the capacity to usefully intervene in the world. It is this broad idea that we explore in probing the judgements of non-philosophers.

Before proceeding, we should introduce a distinction between metaphysical explanations, and acts thereof. Here, we take *an act of metaphysical explanation* to be a speech act that expresses a true proposition of the form ⌜x *because* y⌝, whose utterance plays some relevant psychological-cum-epistemic role for the individual to whom it is uttered (such as, for instance, answering that individual’s ‘why’ question and illuminating for the individual, why x). [[12]](#footnote-12) By contrast, metaphysical explanations are true propositions of the form ⌜x *because* y⌝.

This distinction is important when investigating the context-sensitivity of metaphysical explanation. For it might be that *acts* of metaphysical explanation are context-sensitive in that whether or not a speech act is an act of metaphysical explanation depends on certain psychological-cum-epistemic features of the individual to whom it is offered. Yet it is consistent with this that metaphysical explanations themselves are neither context-sensitive nor agent-relative: they are true propositions of the relevant form, which are true, or false, *simpliciter*, and are so regardless of the psychological-cum-epistemic states of individuals.[[13]](#footnote-13)

In the study we ran we ask participants both whether an assertion of a proposition of the form ⌜x *because* y⌝ is an explanation for some particular individual, and whether the proposition asserted is true. The former question targets the issue of whether the speech act in question is an act of metaphysical explanation. We suppose that participants who respond that a particular speech act is an explanation for the individual in question thereby hold that the speech act is an act of metaphysical explanation for that individual. The latter targets the question of whether the proposition asserted is a metaphysical explanation. We suppose that participants who respond that a particular proposition of the form ⌜x *because* y⌝ is true, are thereby agreeing that the proposition is a metaphysical explanation.

Then we take there to be evidence that people judge *acts* of metaphysical explanation to be both context-sensitive and agent-relative if there are speech acts of ⌜x *because* y⌝, which express the same proposition, such that relative to individuals at certain contexts, some of those speech acts are judged to be metaphysical explanations, and relative to individuals at different contexts, they are judged not to be metaphysical explanations. We take there to be evidence that people judge *metaphysical explanations* to be both context-sensitive and agent-relative if there are assertions of ⌜x *because* y⌝, each of which express the same proposition, such that relative to individuals at certain contexts some of these assertions are judged to be true, and relative to individuals at different contexts, some of these assertions are judged to be false. [[14]](#footnote-14)

In our study we investigated three conditions. Condition 1 is the *epistemic condition*. This is a condition in which the individuals for whom an assertion of ⌜x *because* y⌝ is made, is someone for whom coming to learn y illuminated, for that individual, why x.[[15]](#footnote-15) Condition 1 focuses on the presence of certain mental states in the individuals at the context in question.

Condition 2 is the *intervention condition*. Condition 2 is the condition in which we find the presence of certain non-mental contextual factors. Given the role that the salience of interventions has been found to play in empirical research into casual explanations, we decided to make the presence of certain salient interventions the contextual features in question. Hence condition 2 is a condition in which the individuals for whom the explanation is offered, is in a context in which intervening on [y] in order to intervene on [x] is made especially salient. Importantly, in this condition we do not tell participants that the individual at that context is *aware* of the salience of the intervention. This means that if people differently judge assertions of ⌜x *because* y⌝ in this context compared to others, we can say that their judgements are context-sensitive, but we cannot be sure that they are subjective. It might be that participants assume that the mental state of the individual in that context is appropriately sensitive to the salient intervention and hence their judgement is sensitive to the mental states they take the individual to have. Equally, participants might not assume that the individual is aware of the salient intervention, and their judgements might be objective, but context-sensitive.

Finally, condition 3 is the *absence condition.* In condition 3 it is explicitly stated that the individual for whom the speech act of ⌜x *because* y⌝ is asserted, is someone for whom coming to learn y did *not* in any way illuminate why x; nor is this a condition in which that individual is in a context in which intervening on [y] in order to intervene on [x] is made especially salient.

One might initially wonder about this third condition. This is a condition in which the individual in question asserts that ⌜x *because* y⌝, whilst its also being the case that the individual recognises that coming to learn y did *not* in any way illuminate, for them, why x. By the lights of some, this might come close to a contradiction. Importantly, though, most contemporary theorists of metaphysical explanation, particularly those who embrace a grounding-based approach, hold that ⌜x *because* y⌝ is a metaphysical explanation, or not, irrespective of whether anyone finds x to be illuminated by learning that y. To be sure, these authors think that at least sometimes, we do gain illumination by learning metaphysical explanations; but they do not take this to be necessary in order for there to be a metaphysical explanation. [[16]](#footnote-16) As such, they allow that someone could come to believe that a proposition of the form ⌜x *because* y⌝ is a metaphysical explanation (through, for instance, hearing testimony that this is so) and yet still fail to find that learning so is illuminating, in much the way that one can grant that properties of the big bang causally explain why things are thus and so, and yet contend that learning this does not illuminate, for oneself, why things are thus and so.

Of course, if participants hold that there is a metaphysical explanation present for an individual only if a certain kind of illumination obtains for that individual, then they might find it puzzling that the individual described in this condition asserts that ⌜x *because* y⌝. We take it, however, that such participants can be expected to respond that in this condition the assertion of ⌜x *because* y⌝ is false. After all, it is not open to participants to infer that because the individual in the vignette asserts ⌜x *because* y⌝, that they *must* in fact find that y illuminates for them, why x: for we explicitly say that the individual does not find this to be so. Hence it seems reasonable to suppose that such participants will conclude that although it is puzzling that the individual in the vignette makes this assertion, that they will conclude that the assertion is false in the absence of the relevant mental states of the individual.

In light of evidence regarding our judgements about causal explanations, we made two classes of predictions. The first is the class of predictions about participants’ judgements in each condition. The second is the class of predictions about relative differences in judgements between the conditions.

Let’s consider the first class of predictions. We predicted (1) that participants in conditions 1 and 2 would have mean levels of agreement that were statistically significantly above 4 (i.e. they would, on average, agree) that ⌜x *because* y⌝ is true. We also predicted (2) that participants in those conditions would have mean levels of agreement that are statistically significantly above 4 (i.e. they would, on average, agree) that the speech act of ⌜x *because* y⌝ is an act of metaphysical explanation for the individual;. By contrast, we predicted (3) that participants in condition 3 would have mean levels of agreement statistically significantly *below* 4 (i.e. they would not agree, on average) that ⌜x *because* y⌝ is true. Likewise, we predicted (4) that participants in condition 3 would have mean levels of agreement that were statistically significantly below 4 (i.e.t hey would not agree, on average) that a speech act of ⌜x *because* y⌝ is an act of explanation for the individual.

We also made some predictions about what a majority of participants would judge. In particular, we predicted (5) that a majority of people would judge that the assertion of ⌜x *because* y⌝ is true in conditions 1 and 2, but that a majority would not judge that it is true in condition 3. We also predicted (6) that a majority of people would judge that a speech act of ⌜x *because* y⌝ is an act of explanation for the individual in conditions 1 and 2, but that a majority would not judge that it is an act of explanation for the individual in condition 3.

That brings us to our second class of hypotheses. These were predictions about comparative differences between people’s responses across the three conditions. We predicted (7) that participants in conditions 1 and 2 would have statistically significantly higher mean levels of agreement that ⌜x *because* y⌝ is true, than their levels of agreement that it is true in condition 3. We also predicted (8) that participants would have statistically significantly higher mean levels of agreement that the speech act of ⌜x *because* y⌝ is an act of explanation for the individual in conditions 1 and 2, than in condition 3.

We also predicted (9) there would be no statistically significant difference in mean levels of agreement that ⌜x *because* y⌝ is true between conditions 1 and 2, and no statistically significant difference in mean levels of agreement that a speech act of ⌜x *because* y⌝ is an explanation for the individual between conditions 1 and 2.

Finally, (10) we hypothesised that there would be no statistically significant difference between people’s judgements about whether ⌜x *because* y⌝ is to be true in some condition, and people’s judgements about whether a speech act of ⌜x *because* y⌝ is an act of explanation for the individual in that condition.

This last hypothesis is important. If it is vindicated, it strongly suggests that not only do participants judge that are acts of metaphysical explanation context-sensitive, but so too they judge that metaphysical explanations themselves are context-sensitive.

**3 Experimental Design**

**3.1 Method**

*3.1.1 Participants*

571 people participated in the study. Participants were U.S. residents, recruited and tested online using Amazon Mechanical Turk,[[17]](#footnote-17) and compensated $0.50 for approximately 5 minutes of their time. 148 participants had to be excluded for failing to follow task instructions. This means that they failed to answer the questions (95), or failed an attentional check question (53). The remaining sample was composed of 423 participants (aged 20-79; 162 female, 1 transgender/non-binary). Mean age 33.70 (SD = 10.94). Ethics approval for this study was obtained from the [blanked] Human Research Ethics Committee. Informed consent was obtained from all participants prior to testing. The survey was conducted online using Qualtrics.

*3.1.2 Materials and Procedure*

Participants were divided into three groups, each of which saw a *single* vignette, which we reproduce below. Each vignette corresponded to one of three conditions: the epistemic condition (vignette 1) the intervention condition (vignette 2) and the absence condition (vignette 3).

**Vignette 1: Epistemic condition**

In Sydney, two old friends Fred and Maria are having a discussion about whether the bicycle exists because the wheels, spokes, handlebars and so on exist, and are arranged in a certain way. Maria says that it does; she says that the existence and arrangement of the bicycle parts explains why the bicycle exists. She tells Fred that when she learned that the bicycle parts exist and are arranged in that way, that helped her understand why the bicycle exists. She tells Fred that learning that the bicycle parts exist illuminated, for her, why the bicycle exists. The bicycle exists, she tells Fred, because the bicycle parts exist and are arranged in that way. So, Maria says, the existence and arrangement of the bicycle parts explains why the bicycle exists. The bicycle exists, she tells Fred, because the parts exist and are arranged in a certain way.

*At the end of their discussion Maria utters the sentence* ‘the bicycle exists because the bicycle parts exist and are arranged in a certain way’.

Participants in condition 2 saw the following vignette:

**Vignette 2: Intervention Condition**

In Sydney, two old friends Fred and Maria are having a discussion in a bicycle repair shop about whether the bicycle exists because the wheels, spokes, handlebars and so on exist, and are arranged in a certain way. Maria says that it does. Maria watches as the bicycle-repair man takes a box of bicycle parts out from under his desk and begins to assemble them. Maria notes that the goal of the bicycle-repair man is to bring into existence a new bicycle. Where previously there had only been a box of parts, some time later there is half a bicycle, and, some time after that, there is a whole bicycle. Maria tells Fred that the existence and arrangement of the bicycle parts explains why the bicycle exists. The bicycle exists, she tells Fred, because the parts exist and are arranged in a certain way.

*At the end of their discussion Maria utters the sentence* ‘the bicycle exists because the bicycle parts exist and are arranged in a certain way’.

Participants in condition 3 see the following vignette:

**Vignette 3: Absence Condition**

In Sydney, two old friends Fred and Maria are having a discussion about whether the bicycle exists because the wheels, spokes, handlebars and so on exist, and are arranged in a certain way. Maria says that it does; she says that the existence and arrangement of the bicycle parts explains why the bicycle exists. However, she tells Fred that when she learned that the bicycle parts exist and are arranged in that way, that did **NOT** help her understand why the bicycle exists. She tells Fred that learning that the bicycle parts exist in that arrangement does **NOT** in any way illuminate, for her, why the bicycle exists. She tells Fred that it is a mystery to her why, if the bicycle parts exist in that arrangement, the bicycle will exist. Still, Maria says that the existence and arrangement of the bicycle parts explains why the bicycle exists. The bicycle exists, she tells Fred, because the parts exist and are arranged in a certain way.

*At the end of their discussion Maria utters the sentence* ‘the bicycle exists because the bicycle parts exist and are arranged in a certain way’.

After seeing one of these vignettes all participants were asked to respond to Maria’s statement on two different Likert scales. One of the Likert scales ran from 1 ‘Completely sure that what Maria says is false’ at one end (either the far left or the far right, determined randomly) to 7 ‘Completely sure that what Maria says is true’ at the opposite end of the scale via 4 ‘I am indifferent between these two options’. The other Likert scale ran from 1 ‘Completely sure that the statement is *not* an explanation for Maria’ at one end (either the far left or the far right, determined randomly) to 7 ‘Completely sure that the statement *is* an explanation for Maria via 4 ‘I am indifferent between these two options’.

After having done so, participants were taken to a new page that did not have either the vignette or Likert scales on it and were asked an attentional check question: *“In the vignette you were asked to read, what were Fred and Maria talking about?”* to which they could answer (1) Abstract Objects; (2) Bicycles; (3) God or (4) Minds and Brains. Participants who did not choose (2) were excluded.

*3.1.3 Analyses*

Let’s call participants’ levels of agreement regarding whether Maria’s statement that ‘that the bicycle exists because the bicycle parts exist and are arranged in a certain way’ is true, their *levels of truth agreement.* Let’s call participants’ level of agreement that a speech act of ‘the bicycle exists because the bicycle parts exist and are arranged in a certain way’ is an explanation for Maria, their *levels of explanation agreement*.

In order to test whether participants’ levels of truth agreement and levels of explanation agreement differed significantly from indifference (i.e. choosing 4 on the Likert scale) we ran separate one-sample t-tests to test whether the mean response significantly differs from 4 in each condition. If the mean is significantly above 4, then overall participants might think that what Maria says is true or is an explanation for her; if the mean is significantly below 4 then overall people might think that what Maria says is false or is *not* an explanation for her; if the mean does not differ significantly from for then overall people might be indifferent. We say ‘might be’, here, because of course mean levels can be deceptive. A mean level of just over 4 might be the result of everyone agreeing to the statement (but weakly so) or it might be the result of a majority of people weakly *disagreeing*, and a small minority strongly agreeing. That is in the condition in which the mean is significantly greater than 4 we combined the proportion of people who thought that what Maria said was false, or was not an explanation, with those who were indifferent. We then ran separate one-way 𝜒2-tests to test whether the majority of people responded in agreement that what Maria said was true, or was an explanation for her. We also compared levels of truth agreement and levels of explanation agreement between conditions using separate one-way ANOVAs. Finally, in order to test whether within participants their levels of truth agreement differed significantly from their levels of explanation agreement we ran separate paired-sample t-tests for each condition.

**4. Results**

Let’s consider our first class of hypotheses first. These were predictions regarding participants’ judgements about whether ⌜x *because* y⌝ is true, and about whether a speech act of ⌜x *because* y⌝ is an act of explanation for the individual, in each of the three conditions.

Table 1 below summarises the descriptive data from the experiment. The ‘Yes’ column represents the proportion of participants who reported that what Maria said is true, or that what Maria said is an explanation for her (i.e. who chose 5, 6 or 7 on the Likert scale). The ‘No’ column represents the proportion of participants who reported that what Maria said is false, or that what Maria said is *not* and explanation for her (i.e. who chose 1, 2 or 3 on the Likert scale). The ‘I’ column represents the proportion of people who reported being indifferent between these two options (i.e. chose 4 on the Likert scale).

The one-sample t-tests show us whether the mean response differs significantly from a value of 4. If the p-value is <0.05, then the t-value is significant: the mean is significantly above, or below, 4.

*Table 1. Descriptive data and one-sample t-test results.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Condition | **%Yes** | **%No** | **%I** | **Mean** | **SD** | ***t-value*** | ***p*-value** |
| **Level of Truth Agreement** |
| Condition 1: Epistemic (N = 138) | 79.0 | 9.4 | 11.6 | 5.41 | 1.35 | 12.194 | <.001 |
| Condition 2: Intervention (N = 143) | 83.9 | 7.7 | 8.4 | 5.54 | 1.22 | 15.073 | <.001 |
| Condition 3: Absence (N = 142) | 67.6 | 12 | 20.4 | 5.17 | 1.42 | 9.782 | <.001 |
| **Level of Explanation Agreement** |
| Condition 1: Epistemic (N = 138) | 82.7 | 13.0 | 4.3 | 5.50 | 1.49 | 11.858 | <.001 |
| Condition 2: Intervention (N = 143) | 88.8 | 6.3 | 4.9 | 5.74 | 1.28 | 16.311 | <.001 |
| Condition 3: Absence (N = 142) | 70.4 | 17.6 | 12 | 5.08 | 1.67 | 7.741 | <.001 |

The results of our one-sample t-tests appear to show that overall, participants think that what Maria is says is true, and further what Maria is saying is an explanation for her, in *all* the conditions we tested. So predictions (1) and (2) were vindicated: participants in conditions 1 and 2 have mean levels of truth and explanation agreement that are significantly above 4. Predictions (3) and (4), however, were not vindicated: we did not find that participants in condition 3 had mean levels of truth or explanation agreement that were significantly below 4. Indeed, these levels were significantly *above* 4.

We also made predictions about what a majority of participants would judge. However, the one-sample t-test’s do not tell us whether the majority of people in a given condition judge that what Maria says is true, or is an explanation for her: for that we must look to the results of our one-way 𝜒 2-tests, reported in Table 2 below. Again, a p-value of <0.05 indicates that the 𝜒 2 test is significant.

*Table 2. Results of one-way* 𝜒*2-tests.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Condition** | **%Yes** | **%No/I** | **𝜒2** | ***p*-value** |
| **Level of Truth Agreement** |
| Condition 1: Epistemic (N = 138) | 79.0 | 21.0 | 46.377 | <.001 |
| Condition 2: Intervention (N = 143) | 83.9 | 16.1 | 65.797 | <.001 |
| Condition 3: Absence (N = 142) | 67.6 | 32.4 | 17.606 | <.001 |
| **Level of Explanation Agreement** |
| Condition 1: Epistemic (N = 138) | 82.6 | 17.4 | 58.596 | <.001 |
| Condition 2: Intervention (N = 143) | 88.8 | 11.2 | 86.161 | <.001 |
| Condition 3: Absence (N = 142) | 70.4 | 29.6 | 23.690 | <.001 |

Surprisingly, we found that the majority of participants in all conditions thought that what Maria says is true, and is an explanation for her. Hence our fifth and sixth predictions were only partially vindicated. We predicted (5) that a majority of participants would judge that ⌜x *because* y⌝ is true in conditions 1 and 2, but that a majority would not judge that it is true in condition 3. The first half of this prediction was vindicated, but the second half was not. Likewise, we predicted that (6) that a majority of participants would judge that the speech act of ⌜x *because* y⌝ is an explanation for the individual in conditions 1 and 2, but that a majority would not judge that it is an explanation for the individual in condition 3. Again, only the first half of this prediction was vindicated.

That brings us to our second class of hypotheses. These were predictions about comparative differences between participants’ responses across the three conditions. To test these predictions we compared mean levels of truth agreement and levels of explanation agreement between conditions using separate one-way ANOVAs.

The one-way ANOVA for levels of truth agreement found no significant effect of condition, *F*(2, 420) = 2.796, *p* = .062. Conversely, the one-way ANOVA for levels of explanation agreement did find a significant effect of condition, *F*(2, 420) = 7.118, *p* = .001. Follow-up post-hoc tests with a Bonferroni correction showed that the mean level of explanation agreement in condition 2 was significantly higher than in condition 3 (*p* = .001). No other comparisons reached significance.

We predicted (7) that participants in conditions 1 and 2 would have statistically significantly higher mean levels of agreement that ⌜x *because* y⌝ is true, than their levels of agreement that it is true in condition 3. This hypothesis was *not* confirmed: we found *no* significant effect of condition on mean levels of truth agreement. We also predicted (8) that participants would have statistically significantly higher mean levels of agreement that the speech act of ⌜x *because* y⌝ is an explanation for the individual in conditions 1 and 2, than in condition 3. This hypothesis was only partially confirmed: we found there were significantly higher levels of explanation agreement in condition 2 relative to condition 3, but that was all. Hence our penultimate hypothesis (9) that there would be no significant difference between condition 1 and condition 2 for levels of truth agreement and levels of explanation agreement was confirmed.

Finally, we hypothesised (10) there would be no significant difference between people’s levels of truth agreement and levels of explanation agreement. To test this we compared within-subjects people’s level of truth agreement and level of explanation agreement with separate paired-samples t-tests, reported in Table 3 below. We found no significant difference between an individual’s level of truth agreement and level of explanation agreement across all 3 conditions.

*Table 3. Results of within-subjects t-test results.*

|  |  |  |
| --- | --- | --- |
| **Level of Truth Agreement vs. Level of Explanation Agreement** | ***t-value*** | ***p*-value** |
| Condition 1: Epistemic(N = 138) | -0.727 | .469 |
| Condition 2: Intervention (N = 143) | -1.775 | .078 |
| Condition 3: Absence (N = 142) | 0.605 | .546 |

Lastly, we ran a number of further tests that do not directly speak to any of our hypotheses. While the majority of people in all conditions thought that what Maria says is true, and is an explanation for her, we thought that the condition might have an effect on the *relative* majority in each condition. In order to investigate this possibility, we performed separate 𝜒2 of independence tests for level of truth agreement and level of explanation agreement. First, the 𝜒2 of independence test for level of truth agreement revealed there was a significant relation between condition and the proportion of people who judged that what Maria says is true, 𝜒2 (2, *N* = 423) = 11.182, *p* = .004. Follow-up post-hoc tests with a Bonferroni correction showed a significantly lower proportion of people judged that what Maria is saying is true in condition 3 (*p* = .001).

Similarly, the 𝜒2 of independence test for level of explanation revealed there was a significant relation between condition and the proportion of people who judged that what Maria says, in an explanation for her, 𝜒2 (2, *N* = 423) = 15.938, *p* < .001. Follow-up post-hoc tests with a Bonferroni correction showed two things. First, as with level of truth agreement, the proportion of people who judged that what Maria is saying is an explanation for her was significantly lower in condition 3 (*p* = .001). Interestingly, it also showed that the proportion of people who judged that what Maria is saying is an explanation for her was significantly higher in condition 2 (*p* = .002).

**5 Discussion**

Let’s begin by looking at what these results tell us about the judgements of non-philosophers before we turn to consider what implications these results have for theorising about metaphysical explanation.

First, and importantly, we found no significant difference between non-philosophers’ judgements about whether ⌜x *because* y⌝ is true in some condition, and their judgements about whether a speech act of ⌜x *because* y⌝ is an act of explanation for the relevant individual.

This means that the context-sensitivity of acts of metaphysical explanation and metaphysical explanations themselves stands or falls together: either both are context-sensitive, or neither are.

Some of our results suggest that non-philosophers’ judgements are not context-sensitive. That is because although we found that mean levels of truth and explanation agreement were significantly above 4 in conditions 1 and 2, and that a majority of people judged that ⌜x *because* y⌝ was true, and the speech act in question was an explanation, in those conditions, all as predicted, contrary to our predictions we found the very same thing with regard to condition 3. In addition, while we confirmed our prediction that there would be no significant difference between conditions 1 and 2 regarding mean levels of truth and explanation agreement, we found no significant difference in mean levels of truth agreement across the *three* conditions.

However, when we look to the rest of our results a different picture emerges. We found significant differences in mean levels of *explanation* agreement: people’s mean level of explanation agreement was significantly higher in condition 2 than in condition 3. In addition, our later analyses found statistically significant differences between the *proportions* of participants who made these judgements across the three conditions. In particular, the majority is significantly smaller in condition 3 than in condition 2, both with regard to judgements about whether ⌜x *because* y⌝ is true, *and* regarding judgements about whether the relevant speech act it is an explanation for the individual.

Taken as a whole, these results support the idea that whether a speech act of ⌜x *because* y⌝ counts as an explanation, at a context, and whether a proposition of the form ⌜x *because* y⌝ is true, at a context, is *partially* determined by features of that context: non-philosophers’ judgements are context-sensitive.

Having said that, a majority of participants still thought that the relevant speech act was true, and was an explanation for the subject, even in the absence condition. This, in concert with the fact that we found no significant differences in mean levels of truth agreement across the three conditions suggests that various contextual factors present in conditions 1 and 2 do not play a *huge* role in determining non-philosophers’ judgements. Of course, it may well be how much of a role context has, depends on the specifics of the explanation in question. Perhaps if we presented participants with vignettes describing a determinate and determinable, or a mental state and brain state, or a singleton set and member, we would find that context plays a greater, or lesser, role in these cases. We take it that follow up work is required here.

Are non-philosophers’ judgements subjective as well as context-sensitive? This is a matter with regard to which follow up work would be useful. On the one hand, it’s tempting to say that subjectivity plays no role, since there is no significant difference between condition 1 and 3. On the other hand, there is a difference between condition 2 and 3, and for all we can tell, that difference might be result of participants attributing to the individual an awareness of the relevant intervention at that context. At the very least, though, we can say that the presence of contextual factors such as salient interventions plays a role in determining non-philosophers’ judgements about whether ⌜x *because* y⌝ is an explanation for the individual, in a way that explicit mention of that the fact that the individual understands one fact in terms of another, does not. We found that surprising.

What implications, if any, does this research have for theorising about metaphysical explanation? That depends, unsurprisingly, on how one sees the connection between the judgements of non-philosophers, the judgements of philosophers, and the phenomenon of metaphysical explanation.

We noted earlier in the paper that we are supposing that the notion of metaphysical explanation employed by non-philosophers is the same, or relevantly similar to, that employed by philosophers. One might, however, deny this, and instead argue that philosophers are employing, and developing, a distinctively philosophical notion that is entirely distinct from that employed by non-philosophers. In that case, this empirical work will be of no value in theorising about this distinctively philosophical notion. As we see it, few authors have such a view, not least because to do so runs the risk that one will be accused of developing a new, recherché notion that fails to track anything of interest outside philosophy. But we certainly cannot argue for that claim here, and so we allow that one could have such a view. Then this work might still be of interest, insofar as one might be interested in developing a picture of the notion of metaphysical explanation as it is employed by non-philosophers, but will be of no interest in developing the more specialised notion.

Much more common, we think, is the view that there is some important connection between the notion employed by non-philosophers, and that employed by philosophers. Still, one might worry that this research will still be of limited use in informing theorising about metaphysical explanation. For one might hold that philosophers are employing the notion that non-philosophers would employ, were they to be carefully tutored, and given appropriate reflection on a range of cases, and so on. The philosophical notion, one might think, is the non-philosophical notion appropriate tidied up, after due reflection. But if that is right, then the untutored judgements of non-philosophers tracked by studies such as this one will be of little value: what we want to know are non-philosophers’ tutored judgements.

This is certainly something that ought be borne in mind in evaluating how to use these results in theorising about metaphysical explanation. It is worth noting that studies on causal explanation do not first attempt to explicate and tutor participants about the notion of causal explanation, give the participants examples of the target notion, and then ask them to make various judgements about whether there is a causal explanation present. So insofar as philosophers have taken that research seriously, they ought also take this research seriously.

Moreover, we think it is important to bear in mind the sorts of questions this research is targeting. This study does not ask participants to try and distinguish causal explanation from metaphysical explanation, a task, one might think, that surely would require tutoring on the relevant notions. Nor does this study aim to take controversial cases of putative metaphysical explanation and probe non-philosophers’ judgements about these cases. Again, one might think that this would be of limited value. Nor does this study ask participants whether, for instance, metaphysical explanations are asymmetric, or irreflexive: something that one might expect would require participants to consider a wide range of cases, and to equilibrate over those cases.

Rather, the study takes a fairly straightforward sort of case (a bicycle and its parts), and asks participants whether or not certain speech acts are explanations, and whether what is said, is true. If non-philosopher have indeed been employing a notion of metaphysical explanation for many hundreds of years, as authors have suggested, then we would expect them to be well placed to respond to this kind of probe in the light of this kind of vignette, without any tutoring.

So we are temped to conclude that non-philosophers judgements about this aspect of metaphysical explanation is important raw data in theorising about that phenomenon. Indeed, we are tempted to conclude that this is reason to think that metaphysical explanation is context-sensitive. But for our purposes it suffices that this is useful evidence that ought be considered in our theorising, even if when all is said and done the resulting theory is not one on which metaphysical explanation is context-sensitive.

This study is, of course, just the beginning. Follow up work is required to take up several issues including (a) whether differences in context can change the direction in which non-philosophers’ judge an explanation to hold and (b) whether when non-philosophers’ make different judgements about whether two speech acts of ⌜x *because* y⌝, which express the same proposition, are true, or are explanations for some relevant parties, they also judge that they are *disagreeing*. These are important questions, and determining the answers will go so way towards understanding what sorts of empirical data ought inform our theorising about metaphysical explanation. We hope to have at least gotten the ball rolling.

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1. We use corner quotes here to signify that ⌜x *because* y⌝ is a *kind* of sentence, where x and y are variables that range over sentences. We will speak of ‘an instance of ⌜x *because* y⌝’ when we intend to talk about a particular instance of the schema. We will simply speak of ⌜x *because* y⌝ in order to talk about all instances of the schema. [↑](#footnote-ref-1)
2. Though there are some, such as Wilson (2018) and Schaffer (2016), who think that metaphysical explanation is a sort of non-diachronic causation. [↑](#footnote-ref-2)
3. See for instance Dasgupta (2017) and Fine (1994, 2001). [↑](#footnote-ref-3)
4. [x] should be read as ‘the fact that x’. [↑](#footnote-ref-4)
5. Or, if you prefer, the fact is the truthmaker for the sentence being true. Note that if we simply said that [x] is the fact that obtains iff the sentence x is true, we would not be distinguishing between facts in a sufficiently fine-grained way. See Duncan, Miller and Norton (2017) for a discussion of metaphysical explanation and hyperintensionality. [↑](#footnote-ref-5)
6. Schaffer (2009), Audi (2012), and Rodriguez-Pereyra (2005) endorse truth-conditions along these lines. [↑](#footnote-ref-6)
7. There are various other approaches, including those offered by Kovacs (2017), Miller and Norton (2017) Baron and Norton (2019), Wilson (2014), Shaheen (2017) and Bertrand (2019). [↑](#footnote-ref-7)
8. Exceptions include Norton & Miller (2017), Wilson (2014), Shaheen (2017), and Baron & Norton (2019). [↑](#footnote-ref-8)
9. We will talk of psychological-cum-epistemic states, in order to remain neutral on whether the states are psychological, or epistemic, or some combination. [↑](#footnote-ref-9)
10. We take an individual’s context to include the individuals’ psychological properties at a time and place in a world—and hence that individual’s epistemic goals, beliefs, knowledge, capacities, and so forth—as well as the local environment of that individual. So, for instance, if I am sitting in a boat on the ocean fishing for trout, then this is part of my context, whereas if you are standing at the edge of a volcano measuring lava levels, then this is part of your context. [↑](#footnote-ref-10)
11. Kovacs (2017: fn. 12) reads Correia and Schnieder (2012: 24), Jenkins (2013: §5), Raven (2013: 193, 2015: 326) and Skiles (2015: 719) as endorsing this view. We are inclined to read Correia and Schnieder (2012) as maintaining that the metaphysical notion of *grounding* is not “epistemically loaded” (p. 24), while leaving open that there is a nearby notion of metaphysical explanation which is. Likewise, we are inclined to read Raven (2015) as distinguishing an objective notion of grounding from a notion of metaphysical explanation, which may or may not have epistemic and psychological implications. Other authors have left open that the presence of grounding may be necessary, but not sufficient, for instances of ⌜x *because* y⌝ to be true. For instance, Audi (2012: 119-120) writes: “For all I have said, it may be only a necessary condition of an explanation’s holding between two facts that a relation of determination hold between them. More might be required to fill out a sufficient condition (such as pragmatic or epistemic factors).” [↑](#footnote-ref-11)
12. Here, we roughly follow Achinstein (1983). [↑](#footnote-ref-12)
13. Though it is notable that in the empirical literature on causal explanation, it is often inferred that causal explanations themselves are context-sensitive, on the basis of people’s judgments that some assertions are explanations. [↑](#footnote-ref-13)
14. Technically, people’s judgements can be context-sensitive and not agent-relative. That will be so if people judge that instances of ⌜x *because* y⌝ are true, or false, *simpliciter*, but their judgements depend on the psychology of certain subject(s). So, for instance, if the truth of instances of ⌜x *because* y⌝ depends on how things are, psychologically, with Herbert, then they are subjective, but not agent-relative. Likewise, our judgements might be agent-relative but not context-sensitive: for they might be true, or false, relative to different subjects, but not in virtue of any features of the contexts of those subjects. [↑](#footnote-ref-14)
15. We call the condition epistemic, though it is an open question whether illumination of this sort is an epistemic state, or just a psychological one. [↑](#footnote-ref-15)
16. As noted, Kovacs (2017: fn. 12) reads Correia and Schnieder (2012: 24), Jenkins (2013: §5), Raven (2013: 193, 2015: 326) and Skiles (2015: 719) as endorsing this view. [↑](#footnote-ref-16)
17. These are people in a large database who partake in a range of online experiments, usually in psychology, behavioral economics and sociology, for monetary compensation. While they have significant experience in completing online experiments, there is little reason to think that these people will have a particular interest in, or knowledge of, philosophy. [↑](#footnote-ref-17)