**Judgements of Metaphysical Explanations are Context Sensitive**

Andrew J. Latham and Kristie Miller\*

Department of Philosophy, University of Sydney, Sydney, Australia

**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 various contextual factors, and that said explanations can obtain in one context, and not in another: they are both subjective and agent-relative. Surprisingly, most accounts of metaphysical explanation suppose there to be no psychological, epistemic, or more broadly contextual, aspect to metaphysical explanation. Recently this approach has come under fire from those who argue that since metaphysical explanations are explanations, we should expect them to be both subjective and agent-relative. To date, however, there is no evidence about the conditions under which we make judgements about what metaphysically explains what. In what follows we remedy this. We find that judgements about what metaphysically explains what are indeed context sensitive. We then reflect on the implications of this discovery for extant accounts of metaphysical explanation.

**Keywords:** metaphysical explanation; context sensitive; subjective; agent-relative; experimental philosophy

**Corresponding Author:**

Kristie Miller

Department of Philosophy

University of Sydney

Quadrangle A14

Sydney, NSW 2006

Australia

kristie.miller@sydney.edu.au

**1 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 iff[[4]](#footnote-4) there is a pair of facts, [x][[5]](#footnote-5) 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,[[6]](#footnote-6) and a particular explanatory connection obtains between [y] and [x].[[7]](#footnote-7) Here, we understand facts to be structured parts of the world comprised of objects, properties and relations. One popular approach 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 ‘{Gibbard} exists *because* Gibbard exists’ is true because [Gibbard exists] grounds [{Gibbard} exists]: the former fact bears the relation of ground to the latter fact.

Recently there has been debate about whether metaphysical explanation is subjective or agent-relative. We will say that metaphysical explanation is *agent-relative* iff instances of ⌜x *because* y⌝ are always true, or false, relative to some individual or other. Hence metaphysical explanation is agent-relative just in case whether ⌜x *because* y⌝ is true can only ever be assessed relative to an individual. We will say that metaphysical explanations are *agent-neutral* iff they are not agent-relative. Further, let’s 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. Here, we will take an individual’s context to be something broader than just a centred world (a world centred on an individual at a time and place). We take an individual’s context to include all of 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.

Then one way for metaphysical explanations to be context sensitive is if they are *subjective*, where we will say that metaphysical explanations are subjective iff whether an instance of ⌜x *because* y⌝ is true depends on the mental states of (certain) subjects. Since one aspect of an individual’s context is that individual’s mental states—their epistemic goals, their background knowledge, their state of understanding—one way in which metaphysical explanation can be context sensitive is if it is subjective. 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. For instance, certain features of a local environment might make certain interventions particularly salient; this will be a feature of that local environment even if the individual at that context is someone for whom those interventions are not salient. Then metaphysical explanations are *objective* iff they are not subjective, and are *context insensitive* just in case they are not context sensitive. If metaphysical explanations are context insensitive, then they are objective, though the converse does not hold.

Explanation—whether metaphysical or not—seems to be something that involves both context sensitivity and agent-relativity. It seems natural to think that explanations are things that track some worldly structure, and in so doing increase understanding, or make some phenomena intelligible, or answer some ‘why’ question. Insofar as explanations are thought to be things that perform any of these roles, they will be subjective: for whether there is an explanation present will depend on whether that explanation induces certain psychological features in the relevant subject. Since these psychological features seem to be important insofar as they are connected to knowledge—having understanding, or finding some phenomenon to be illuminated, or answering some why question all seem to be important components of coming to know something—we will call them *epistemic* features of explanation. If explanations are thought of in this way it is also very plausible that they will be agent-relative. After all, what increases understanding, or illuminates some phenomenon, or answers some why question, for one subject, might not do so for another. So insofar as one thinks that explanations are subjective in something like this manner, then one also ought think that they are agent-relative: something is always an explanation for some particular subject at some particular context.

Some authors have concluded, on this basis, that metaphysical explanations must be both subjective and agent-relative.[[9]](#footnote-9) In light of this, these authors have argued that contemporary accounts of metaphysical explanation, which appeal to the existence of grounding relations obtaining between facts, are inadequate because they cannot accommodate either the subjectivity or agent-relativity of metaphysical explanation. That is because whether or not a grounding relation obtains between certain facts is not itself an agent-relative or subjective matter.

By and large, and rather surprisingly, defenders of contemporary approaches to metaphysical explanation have had little to say about the 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 epistemic (or, more broadly psychological) features present.[[10]](#footnote-10)

Let’s say that people’s *judgements* about whether assertions of ⌜x *because* y⌝ are metaphysical explanations, are *agent-relative* iff their judgements about whether assertions of ⌜x *because* y⌝ are metaphysical explanations are always judgements relative to some particular subject. Then let’s say that people’s *judgements* about whether assertions of ⌜x *because* y⌝ are metaphysical explanations, are *context sensitive* iff their judgements about whether assertions of ⌜x *because* y⌝ are metaphysical explanations, non-trivially[[11]](#footnote-11) depend on features of the context they are assessing. In particular, people’s *judgements* about whether assertions of ⌜x *because* y⌝ are metaphysical explanations, are *subjective* iff their judgements about whether assertions of ⌜x *because* y⌝ are metaphysical explanations non-trivially depend on the psychological or epistemic features of the subject relative to whom they are assessing whether the utterance is a metaphysical explanation.

Technically, then, people’s judgements can be context sensitive and not be agent-relative. That will be so if people judge that instances of ⌜x *because* y⌝ are simply true, or false, *simpliciter* and not relative to particular subjects, but their judgements depend on the psychology of certain subject(s). So, for instance, this will be so if the truth of instances of ⌜x *because* y⌝ depends on how things are, psychologically, with Herbert, but instances of ⌜x *because* y⌝ are not true, or false, relative to different subjects. Likewise, our judgements about whether assertions of ⌜x *because* y⌝ are metaphysical explanations might be agent-relative even though they are 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. Indeed, our judgements can be agent-relative even if we make the same judgements about the truth-values of instances of ⌜x *because* y⌝ relative to every subject. That will be so if we always evaluate instances of ⌜x *because* y⌝ relative to a subject, but in fact any particular instance of ⌜x *because* y⌝ is always true, or false, relative to all subjects.

Given, however, that the agent-relativity and context sensitivity of metaphysical explanation is motivated by the idea that people will judge that some instances of ⌜x *because* y⌝ are metaphysical explanations relative to subjects in certain contexts that have certain properties, and not relative to other subjects at other contexts which lack those properties, in what follows we will take certain judgement patterns to be evidence both that our judgements are context sensitive and that they are agent-relative.

In particular, we will suppose there to be evidence that people’s judgements are both context sensitive and agent-relative, if there are assertions of ⌜x *because* y⌝, each of which express the *same* proposition, such that (i) relative to subjects at certain contexts, some of these assertions are judged to be true, and relative to subjects at different contexts, some of these assertions are judged to be false *or* (ii) relative to subjects at certain contexts, some of those assertions are judged to be metaphysical explanations, and relative to subjects at different contexts, some of those assertions are judged to not be metaphysical explanations. Importantly, then, failing to find that pattern of judgements does not show that people’s judgements are neither context sensitive nor agent-relative, though it does show that they are not context sensitive or agent-relative in the sorts of ways that some people have supposed them to be.

Notably, although there is quite a bit of empirical research on whether our judgements about causal explanations are context sensitive or agent-relative, there is no such research on people’s judgements about metaphysical explanations. This paper aims to remedy this. To be clear, though, we don’t think that determining whether people’s judgments are context sensitive or agent-relative will settle whether extant accounts of metaphysical explanation are inadequate. That is because defenders of such approaches might be able to accommodate our judgements being both agent-relative and context sensitive by taking such judgements to be judgments about *acts* of metaphysical explanation rather than about metaphysical explanations themselves. We take an act of metaphysical explanation to be a speech act that expresses a proposition of the form ⌜x *because* y⌝.[[12]](#footnote-12) Then perhaps particular speech acts, in contexts, that express such propositions count as acts of metaphysical explanation, or not, depending on features of those contexts. Then acts of metaphysical explanation will be agent-relative and context sensitive, but it might still be that metaphysical explanations themselves are agent-neural and context insensitive, because a proposition expressed by any such speech act expresses a metaphysical explanation (if the proposition is true) regardless of whether the speech act is an act of explanation.

This is not to say that there are no discoveries we could make about people’s judgements that would tend to undermine contemporary accounts of metaphysical explanation. For instance, if we found that for a range of cases people are inclined to judge both that an assertion of ⌜x *because* y⌝ is an act of metaphysical explanation in some context, and also that an assertion of ⌜y *because* x⌝ is an act of metaphysical explanation in a different context, this would be data that contemporary theorists would find almost impossible to accommodate, given that they hold that metaphysical explanations are asymmetric. For then at most one of those speech acts could be an act of metaphysical explanation.

Our aim, in this paper, is a modest one. We aim to determine whether there is evidence that people’s judgements about whether assertions of ⌜x *because* y⌝ are metaphysical explanations, are agent-relative or context sensitive. This is the first task in the much broader project of determining what sorts of judgements about metaphysical explanations, or acts thereof, an account of metaphysical explanation must accommodate, and hence whether such accounts can in fact accommodate (or otherwise explain away) these judgments.

As things stand, however, we don’t yet even know *whether* there is evidence that people’s judgements are agent-relative or context sensitive, let alone whether they are agent-relative and context sensitive in a way that is a threat to contemporary accounts of metaphysical explanation.

We begin, in §2, by briefly outlining some of the plentiful empirical research into people’s 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**

So far there has been no dedicated empirical research into metaphysical explanation; there is, however a wealth of empirical research on causal explanation. We cannot hope to summarise that research here: instead, we aim to give a brief overview of some of the notable findings that can guide the generation of hypotheses regarding judgements about metaphysical explanations.

In what follows we will suppose that these studies aim to determine whether judgements about speech acts of the form ⌜x because y⌝, where ‘because’ picks out a causal connection between facts or events, are context sensitive, or agent-relative, and if so what sorts of factors are relevant to these judgements. If one thinks that such speech acts just are causal explanations, then this is empirical evidence about the features of causal explanations themselves. We have no dog in this race, but since we want to distinguish acts of metaphysical explanation from metaphysical explanations, we will do the same for acts of causal explanation and causal explanations.

Very generally, then, there is wide ranging evidence that subjects will differently prefer, or disprefer, different putative acts of causal explanation depending on features of context. At the cultural level such factors include whether the culture of which the subject 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 acts 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 subject 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 acts of 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) acts of causal explanation that afford them practical control. So, for instance, people are more likely to prefer acts of causal explanation that appeal to causal factors over which they have control, to those which 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 explanations are relatively stable (see Kelemen, Rottman, & Seston (2013) and Lombrozo (2007)).

While we think there is good reason to predict that there will be cultural differences between subject’s judgements about acts of metaphysical explanation, predicting which cultural differences can be expected to correlate with which differences regarding such judgements 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 acts of causal explanation, it is plausible to hypothesise that people will prefer putative acts of metaphysical explanation that are useful to them, and that they will be more inclined to judge that a speech act is an act of metaphysical explanation if that speech act is useful to the person for whom it is provided. In particular, we might hypothesise that people will prefer putative acts of metaphysical explanation that provide the person to whom they are offered, with understanding, or illumination, or the capacity to usefully intervene in the world, and will be more inclined to judge that a speech act is an act of metaphysical explanation if that speech act provides the person to whom it is provided, with understanding, or illumination, or the capacity to usefully intervene in the world.

At this stage of investigation, we do not want to too finely-grain the sorts of contextual factors that might make a difference to people’s judgements about acts of metaphysical explanation. Instead, we want to know whether the presence of certain very broad subjective features—such as understanding—makes a difference to people’s judgements about acts of metaphysical explanation, and whether the presence of certain broad contextual features—such as the presence of an environment in which certain useful interventions are made salient—makes a difference to people’s judgements about acts of metaphysical explanation.

In the study that follows we present participants with three vignettes, which feature an agent at three contexts that differ in three ways. If we find that people’s judgements about whether that assertion is true, or is an explanation *for* that subject, are different across these different contexts, then this is reason to think that their judgements about whether that assertion is a metaphysical explanation are context sensitive and agent-relative.

In our study we investigated three conditions. Condition 1 is the *epistemic condition*. This is a condition in which the subject for whom an assertion of ⌜x *because* y⌝ is made, is someone for whom coming to learn y illuminated, for that subject, why x. Condition 1, then, focuses on the presence of certain mental properties in the subject 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 subject 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 subject at that context is *aware* of the salience of the intervention, nor that they are not aware of it. This means that if people differently judge assertions of ⌜x *because* y⌝, in this context compared to other contexts, we can say that their judgements are context sensitive, but we cannot say whether or not they are subjective. It might be that their judgements are context sensitive in virtue of being subjective: for it might be that participants simply assume that the mental state of the subject in that context is appropriately sensitive to the salient intervention. Equally, participants might not assume that the subject 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.

If people’s judgements differ, regarding whether an utterance of ⌜x *because* y⌝ is true, or is an explanation for the relevant subject, across these conditions, this is evidence that people’s judgements are context-sensitive and are agent-relative. It may also be evidence that these judgements are subjective.

We made two classes of predictions. The first class is the class of predictions about people’s judgements in each condition. The second class 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 (the mid-point on the scale), that the assertion of ⌜x *because* y⌝ is true: that is, they would, on average, agree that the assertion was true. We also predicted (2) that participants in those conditions would have mean levels of agreement that are statistically significantly above 4, that the assertion of ⌜x *because* y⌝ is an explanation for the subject: that is, they would, on average, agree that the assertion is an explanation for the subject. By contrast, we predicted (3) that participants in condition 3 would have mean levels of agreement that ⌜x *because* y⌝ is true, that are statistically significantly *below* 4: that is, they would, on average, judge that the assertion is not true. Likewise, we predicted (4) that participants in condition 3 would have mean levels of agreement that ⌜x *because* y⌝ is an explanation for the subject, that were statistically significantly below 4.

We also made some predictions about what a majority of participants would judge. I particular, we predicted (5) that a majority of people would judge that the assertions 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 ⌜x *because* y⌝ is an explanation for the subject in conditions 1 and 2, but that a majority would not judge that it is an explanation for the subject 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 the relevant speech act of ⌜x *because* y⌝ is true, than their levels of agreement that the speech act 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 explanation for the subject 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 ⌜x *because* y⌝ is an explanation for the subject between conditions 1 and 2. That is, we thought it would make no difference whether the subject had certain mental properties, or was in a context in which certain interventions were salient. Finally, (10) we hypothesised that there would be no statistically significant difference between people’s judgements about whether ⌜x *because* y⌝ is judged to be true in some condition, and people’s judgements about whether ⌜x *because* y⌝ is an explanation for the subject in that condition. That is, we thought that insofar as people judged an assertion to be true, they would judge it to be an explanation, and *vice versa.*

**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,[[13]](#footnote-13) 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 then 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 ‘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 people’s 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.[[14]](#footnote-14) If the mean is significantly above 4, then overall people 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 people’s judgements about whether the assertion of ⌜x *because* y⌝ is true, or is an explanation for the subject, 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.

*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, people 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: in conditions 1 and 2, mean levels of truth and explanation agreement are significantly above 4. Predictions (3) and (4), however, were not vindicated: we did not find that in condition 3 mean levels of truth or explanation agreement 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.

*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 people 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 people would judge that the assertions 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. The first half of this prediction was vindicated, but the second half was not. Likewise, we predicted that (6) that a majority of people would judge that ⌜x *because* y⌝ is an explanation for the subject in conditions 1 and 2, but that a majority would not judge that it is an explanation for the subject 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 people’s 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 in conditions 1 and 2 there would be statistically significantly higher mean levels of agreement that the relevant speech act of ⌜x *because* y⌝ is true, than 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 there would be statistically significantly higher mean levels of agreement that the speech act of ⌜x *because* y⌝ is an explanation for the subject 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. Descriptive data and between-sample 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 the proportion of people who judged that what Maria is saying is true in condition 3 was significantly lower than expected (*p* = .001).[[15]](#footnote-15)

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 in condition 3 was significantly lower than expected (*p* = .001). Interestingly, it also showed the proportion of people who judged that what Maria is saying is an explanation for her in condition 2 was significantly higher than expected (*p* = .002).

**5 Discussion**

Some of our results seem to suggest that people’s judgements are neither context sensitive nor agent relative. That is because as predicted, 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 the assertion was true, and was an explanation, in those conditions, contrary to our predictions we found the very same thing with regard to condition 3. In addition, we confirmed our prediction that there would be no significant difference between conditions 1 and 2 regarding mean levels of truth and explanation agreement, whilst also finding no significant difference in mean levels of truth agreement across the *three* conditions.

However, when we look to the rest of our results a somewhat 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, both with regard to judgements about whether ⌜x *because* y⌝ is true, *and* regarding judgements about whether it is an explanation. Further, the majority is significantly larger in condition 2 with regard to judgments about whether ⌜x *because* y⌝ is an explanation.

Taken as a whole, these results support the idea that whether a speech act counts as an explanation, at a context, is partially determined by features of that context: people’s judgements are context sensitive and agent-relative.

Are people’s judgements also subjective? 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 subject 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 people’s judgements about whether ⌜x *because* y⌝ is an explanation for the subject, in a way that explicit mention of that the fact that the subject understands one fact in terms of another, does not. We found that surprising.

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 agreement to truth across the three conditions, suggests that various contextual factors present in conditions 1 and 2 do not play a *huge* role in determining people’s judgements.

This might be seen as grist for the mill of contemporary accounts of metaphysical explanation. If most people judge that a speech act is an *act* of explanation even in the absence condition, this provides some, albeit defeasible, reason to think that there might be a notion of metaphysical explanation which is agent-neutral and context insensitive: for it suggests that something explanatory is going on even when the subject does not understand one fact in terms of the other, and even when no intervention is salient.

Notably, however, we also hypothesised that there would be no significant difference between people’s judgements about whether ⌜x *because* y⌝ is judged to be true in some condition, and people’s judgements about whether ⌜x *because* y⌝ is an explanation for the subject. Results showed no significant difference here.

This shows that in general, people judge that an assertion of ⌜x *because* y⌝ is true only if it is an explanation for the relevant subject. While this is what we predicted, it goes some way towards undermining the view that while certain speech acts of ⌜x *because* y⌝ fail to be acts of explanation at certain contexts, they nevertheless express true propositions, and hence are metaphysical explanations. If those propositions are true, but simply fail to be acts of explanation at some contexts, then we might expect people’s mean levels of truth judgement to be high across all three conditions, but their mean levels of explanation judgement to be low in condition 3. This is not what we find. We find that there is no significant difference between people’s mean truth and explanation judgements across any of the three conditions. Of course, someone wishing to cleave acts of explanation from explanations themselves could argue that non-philosophers are not equipped to distinguish the truth of an assertion at a context, from whether that assertion is an act of explanation at that context. Our claim, here, is just that this is data that any theorist will need to accommodate in some way (even if by explaining it away as a mistake on the part of participants).

In all, this study only begins the task of cataloguing the ways that people’s judgements about whether a speech act is a metaphysical explanation, are contextually sensitive. For all we have said here, it could still be that there are judgements that people make about such cases, which will be difficult for extant accounts of metaphysical explanation to accommodate. For instance, we did not test to see whether participants would sometimes judge both that a speech act of ⌜x *because* y⌝ is an act of metaphysical explanation, and that ⌜y *because* x⌝ is also an act of metaphysical explanation. So, this study does not show that recent concerns about extant accounts are misplaced. Nor does it show that such contemporary accounts are, decisively, in hot water. This is, after all, only preliminary work.

Follow up work is required to take up several issues including (a) whether differences in context can change the direction in which people judge an act of explanation to hold and (b) whether when people 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 any theory of metaphysical explanation needs to account for, or explain away. We hope to do have done no more than get the ball rolling.

**References**

Achinstein, P. (1983). *The Nature of Explanation*. New York: Oxford University Press.

Audi, P. (2012). ‘A clarification and defense of the notion of grounding.’ In F. Correia & B. Schnieder (Eds.), *Metaphysical grounding: Understanding the structure of reality* (pp. 101–121). Cambridge: Cambridge University Press.

Baron, S., & Norton, J.(2019). ‘Metaphysical Explanation: The Kitcher Picture.’ *Erkenntnis*. DOI 10.1007/s10670-018-00101-2

Beasley, T. M., & Schumacker, R. E. (1995). Multiple Regression Approach to Analyzing Contingency Tables: Post Hoc and Planned Comparison Procedures. *The Journal of Experimental Education*, 64(1), 79-93.

Chin-Parker, S., & Bradner, A. (2010). ‘Background shifts affect explanatory style: How a pragmatic theory of explanation accounts for background effects in the generation of explanations.’ *Cognitive processing*, *11*(3), 227-249.

Dasgupta, S. (2017). ‘Constitutive Explanation.’ *Philosophical Issues* 27(1):74-97.

Duncan, M., Miller, K and J Norton (2017) “Is grounding a hyperintensional phenomenon?” *Analytic Philosophy.*  58(4), 297-329. https://DOI: 10.1111/phib.12105

Fine, K. (1994). ‘Essence and modality.’ *Philosophical Perspectives, 8,* 1–16.

Hilton, D. J. (1990). ‘Conversational processes and causal explanation.’ *Psychological Bulletin*, *107*(1), 65.

Hilton, D. J., & Erb, H. P. (1996). ‘Mental models and causal explanation: Judgements of probable cause and explanatory relevance.’ *Thinking & Reasoning*, 2(4), 273–308.

Hitchcock, C., & Knobe, J. (2009). ‘Cause and norm.’ *Journal of Philosophy*, 11(11), 587–612.

Hoyos, C. and D Gentner (2017). ‘Generating explanations via analogical reasoning’ *Psychonometric Bulletin Review* 24:1364–1374 DOI 10.3758/s13423-017-1289-5

Jenkins, C. S. I. (2013). ‘Explanation and fundamentality.’ *Varieties of Dependence: Ontological Dependence, Grounding, Supervenience, Response-Dependence*, 211-42.

Kahneman, D., & Miller, D. T. (1986). ‘Norm theory: Comparing reality to its alternatives.’ *Psychological Review,* 93(2), 136–153.

Keil, F. C (2006). ‘Explanation and Understanding’ *Annu. Rev. Psychol.* 57:227–54 doi: 10.1146/annurev.psych.57.102904.190100

Kelemen, D., Rottman, J., & Seston, R. (2013). ‘Professional physical scientists display tenacious teleological tendencies: Purpose-based reasoning as a cognitive default.’ *Journal of Experimental Psychology: General*, 142(4), 1074.Kovacs, D. M. (2017). ‘Grounding and the argument from explanatoriness.’ *Philosophical Studies*, *174*(12), 2927-2952.

Kovacs, D. M. (forthcoming). ‘Metaphysically Explanatory Unification.’ *Philosophical Studies*. DOI:10.1007/s11098-019-01279-z

Lombrozo, T. (2007). ‘Simplicity and probability in causal explanation.’ *Cognitive psychology*, *55*(3), 232-257.

Maurin, A-S. (2018). ‘Grounding and metaphysical explanation: it’s complicated.’ *Philosophical Studies*. DOI:10.1007/s11098-018-1080-0

McGill, A. L. (1989). ‘Context effects in judgments of causation.’ *Journal of Personality and Social Psychology*, *57*(2), 189.

Medin DL, Atran S. 2004. ‘The native mind: biological categorization, reasoning and decision making in development across cultures.’ *Psychol. Rev*. 111:960–83

Medin DL, Ross N, Atran S, Cox D, Wakaua HJ, et al. (2005). ‘The role of culture in the folk biology of freshwater fish’. *Cogn. Psychol.*

Murphy, G.L. and Medin, D.L. (1985) The role of theories in conceptual coherence. Psychol. Rev. 92, 289–316

Miller, K & Norton, J. (2017). ‘Grounding: it’s (probably) all in the head.’ *Philosophical Studies*, 174(12), 3059-3081.

Murphy, G. L., & Medin, D. L. (1985). ‘The role of theories in conceptual coherence.’ *Psychological review*, *92*(3), 289.

Nisbett, R. E. (2003). *The Geography of Thought: How Asians and Westerners Think Diﬀerently... and Why.* New York: Simon/Schuster.

Norton, J., & Miller, K. (2017). ‘A Psychologistic Theory of Metaphysical Explanation’. *Synthese*. DOI 10.1007/s11229-017-1566-x

Pearl, Judea (2000). *Causality: Models, Reasoning, and Inference*. Cambridge University Press.

Pennington, N., & Hastie, R. (1993). Reasoning in explanation-based decision making. *Cognition*, *49*(1-2), 123-163.

Prasada, S., & Dillingham, E. M. (2006). ‘Principled and statistical connections in common sense conception.’ *Cognition*, *99*(1), 73-112.

Prasada, S., & Dillingham, E. M. (2009). ‘Representation of principled connections: A window onto the formal aspect of common sense conception.’ *Cognitive Science*, *33*(3), 401-448.

Prasada, S., Khemlani, S., Leslie, S. J., & Glucksberg, S. (2013). ‘Conceptual distinctions amongst generics.’ *Cognition*, *126*(3), 405-422.

Raven, M. J. (2013). ‘Is ground a strict partial order?’ *American Philosophical Quarterly*, *50*(2), 193-201.

Raven, M. J. (2015). ‘Ground.’ *Philosophy Compass*, 10(5), 322–333.

Rodriguez-Pereyra, G. (2005). ‘Why Truthmakers?’ In H. Beebee and J. Dodd (eds.), *Truthmakers: The Contemporary Debate*. Oxford: Clarendon Press.

Schaffer, J. (2009). ‘On What Grounds What.’ In D. Manley, D. Chalmers, and R. Wasserman (eds.), *Metametaphysics: New Essays on the Foundations of Ontology*. Oxford: Oxford University Press.

Schaffer, J. (2016). ‘Grounding in the image of causation.’ *Philosophical Studies* 173 (1):49-100.

Shaheen, J. L. (2017). ‘The causal metaphor account of metaphysical explanation.’ *Philosophical Studies*, *174*, 553–578.

Skiles, A. (2015). ‘Against Grounding Necessitarianism.’ *Erkenntnis,* 80(4):717-751.

Thompson, N. (2016). ‘Grounding and metaphysical explanation.’ *Proceedings of the Aristotelian Society*, 116(3):395–402.

Triandis, H. C. (1996). ‘The psychological measurement of cultural syndromes.’ *American psychologist*, 51(4), 407-415.

Triandis H. C. 1995. *Individualism and Collectivism*. Boulder, CO: Westview

Van Fraassen, B. C. (1980). *The scientific image*. Oxford University Press.

Vasilyeva, N., Wilkenfeld, D., & Lombrozo, T. (2017). ‘Contextual utility affects the perceived quality of explanations.’ *Psychonomic bulletin & review*, *24*(5), 1436-1450.

Vlach, H. A., & Noll, N. (2016). Talking to children about science is harder than we think: characteristics and metacognitive judgments of explanations provided to children and adults. *Metacognition and Learning*, *11*(3), 317-338.

Wilson, A. (2018). ‘Metaphysical causation.’ *Noûs*, *52*(4), 723-751.

Wilson, J. (2014). ‘No Work for a Theory of Grounding.’ *Inquiry*, 57(5–6):1–45.

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. Some authors have left open that the presence of this explanatory connection 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).” We return to this issue later. [↑](#footnote-ref-4)
5. [x] should be read as ‘the fact that x’. [↑](#footnote-ref-5)
6. 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-6)
7. Schaffer (2009), Audi (2012), and Rodriguez-Pereyra (2005) endorse truth-conditions along these lines. [↑](#footnote-ref-7)
8. Exceptions include Norton & Miller (2017), Wilson (2014), Shaheen (2017), and Baron & Norton (2019). [↑](#footnote-ref-8)
9. See for instance Maurin (2018) and Thompson (2016). [↑](#footnote-ref-9)
10. 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 notion of metaphysical explanation, which may or may not have epistemic and psychological implications. [↑](#footnote-ref-10)
11. Clearly each person’s judgments about anything at all trivially depend on the mental states of some subject, namely that person making the judgment, and hence trivially depend on features of context if the person making the judging is assessing whether a metaphysical explanation is true at their own context. We will say a metaphysical explanation non-trivially depends on features of the context being assessed just in case either (a) it depends on non-mental features of the context or (b) it depends of mental features of the context, and the context being assessed is not the same as the context of the individual making the judgment or (c) it depends on mental features of the context being assessed, which is the same as the context of the judgment, and those mental states provide *reasons* for the judgment, rather than being the mental states on which the judgment supervenes, or which cause the judgment. [↑](#footnote-ref-11)
12. Here, we roughly follow Achinstein (1983). [↑](#footnote-ref-12)
13. 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-13)
14. If the p-value is <0.05, then the t-value is significant: the mean is significantly above, or below, 4. [↑](#footnote-ref-14)
15. Here we used procedures developed by Beasley and Schumacker (1995). [↑](#footnote-ref-15)