

## General theories of explanation: buyer beware

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Received: 1 June 2011 / Accepted: 4 October 2011 / Published online: 20 October 2011  
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**Abstract** We argue that there is no general theory of explanation that spans the sciences, mathematics, and ethics, etc. More specifically, there is no good reason to believe that substantive and domain-invariant constraints on explanatory information exist. Using Nickel (*Noûs* 44(2):305–328, 2010) as an exemplar of the contrary, generalist position, we first show that Nickel’s arguments rest on several ambiguities, and then show that even when these ambiguities are charitably corrected, Nickel’s defense of general theories of explanation is inadequate along several different dimensions. Specifically, we argue that Nickel’s argument has three fatal flaws. First, he has not provided any compelling illustrations of domain-invariant constraints on explanation. Second, in order to fend off the most vehement skeptics of domain-invariant theories of explanation, Nickel must beg all of the important questions. Third, Nickel’s examples of explanations from different domains with common explanatory structure rely on incorrect formulations of the explanations under consideration, circular justifications, and/or a mischaracterization of the position Nickel intends to critique. Given that the best and most elaborate defense of the generalist position fails in so many ways, we conclude that the standard practice in philosophy (and in philosophy of science in

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particular), which is to develop theories of explanation that are tailored to specific domains, still is justified. For those who want to buy into a more ambitious project: beware of the costs!

**Keywords** Explanation · Explanatory skepticism · Context · Nickel · Domain-specificity

## 1 Introduction

Scientists, mathematicians, philosophers, and the proverbial person on the street are all voracious producers and consumers of explanations. Given the pervasiveness of explanations in our lives, it should come as no surprise that philosophers have long sought to provide a general theory of explanation, spanning all of these different domains. Nor is it surprising that such attempts have faced searching criticisms. Perhaps the last great attempt was Hempel's theory of explanation (Hempel 1965), but anyone vaguely acquainted with Hempel's legacy is bound to know the litany of colorful counterexamples that theory has faced. The blemishes on Hempel's record include flagpoles and shadows, syphilitic mayors, men taking birth control pills, and samples of hexed salt.<sup>1</sup>

Post-Hempelian theories of explanation are less ambitious in their aims, as they purport to offer explanations that apply only to a subset of domains in which explanations are given and taken. While some theories aspire to offer accounts of *scientific* explanation writ large, they grant that mathematics, philosophy, and other non-scientific domains fall out of their purview (Strevens 2008). More frequently, theories of explanation try to capture a broad kind of explanatory relevance, e.g. causal (Woodward 2003) or functional (Cummins 1975), while nevertheless countenancing other kinds of explanatory relevance. Furthermore, it is becoming increasingly common to be even more modest than this, by discussing only a special class of explanation within a particular discipline, e.g. asymptotic explanations in theoretical physics (Batterman 2002) or constitutive explanations in neuroscience (Craver 2007).

The current focus on domain-specific models of explanation in philosophy of science suggests that there can be no general, domain-invariant theory of explanation, i.e. no theory that covers explanation in the different sciences *and* in mathematics *and* in ethics, etc. The tacit and default assumption appears to be that such generality would walk a tenuous line between falsehood and triviality.

However, Nickel (2010) has recently challenged this push towards merely domain-specific theories of explanation. In “How General Do Theories of Explanation Need To Be?” he defends the position that “there are substantive, context-invariant constraints on explanatory information” (p. 310). In other words, “there are substantive, context-invariant conditions a because-claim has to satisfy in order to be true” (p. 310). These constraints span all domains of inquiry, including “science, mathematics, ethics” (p. 307). Hence, Nickel appears to endorse the following:

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<sup>1</sup> Salmon (1989) provides the most comprehensive review of the explanation literature.

**GENERALISM** There are *substantive* and *domain-invariant* constraints on explanatory information.

While we take Nickel to have offered the most promising arguments for GENERALISM to date, we shall argue that those arguments are unsound. Thus, while we focus on Nickel's position, we take our challenges to have broader implications for philosophical discussions of explanation. Specifically, while our arguments do not render a general theory of explanation impossible, they show that there are no good reasons to accept it. Hence, unless better arguments for GENERALISM come to the fore, the safest answer to Nickel's question seems to be: "Only moderately general."

In Sect. 2, we clarify some ambiguities in Nickel's central theses with the aim of charitably reconstructing his broad argumentative strategy for establishing GENERALISM. In Sect. 3 through Sect. 5, we present and critique Nickel's three sub-arguments for establishing GENERALISM. In Sect. 6 we conclude that GENERALISM is unsubstantiated, and raise questions about what is to be gained by having a truly general theory of explanation.

## 2 Clarifications

While GENERALISM requires one or more invariant constraints on explanation, this is compatible with there *also* being specific constraints within specific disciplines and contexts. For example, it may be the case, as Nickel assumes, that for  $q$  to provide distinctively explanatory information (for some explanandum  $p$ ),  $q$  must be true, regardless of the context or domain in which  $p$  and  $q$  figure. But this does not rule out the possibility that explanation in, for example, the natural sciences and in mathematics also involves very different specific constraints. (Hereafter, we focus on domain-sensitivity, viewing it as the paradigmatic form of context-sensitivity. It should be noted that Nickel nowhere makes a clear distinction between contexts and domains.) Although Nickel does not state whether the domain-invariant constraints are the only constraints in every occasion or are only some of the constraints in every occasion, several passages suggest the latter:

...due to *a* context-invariant condition on explanatory information...

...this conclusion amounts to saying that *a* substantive constraint on explanation is context-invariant...

I will be arguing for *a* context-invariant component to the truth-conditions of because-claims (p. 311, our italics).

And in his conclusion, Nickel acknowledges that he is also happy to allow for domain-specific constraints (even though he doesn't use the word 'constraint') on the quality of explanations.

But what exactly does GENERALISM entail? Much depends on what "substantive" means here. Nickel is not fully explicit about this. On the one hand, he seems to tie "substantive" to the semantics of because-claims (p. 310). On the other hand, he seems to mean that whatever accounts for the asymmetry of explanation (cf. *infra*, Sect. 3) should count as substantive—given the centrality of the latter phenomenon (p. 311). So it is an open question whether he would equate "substantive" with

(or define it as) “semantic”. Yet it is clear that he takes the semantics of the very concept of explanation to provide substantive constraints (and he does not discuss any other sources of substantive constraints). More concretely, Nickel takes explanations to be because-claims,<sup>2</sup> and a substantive constraint on explanation seems to specify conditions under which such because-claims can turn out false, even when both the explanans and explanandum are true. For instance, consider the following explanation:

(\*) Ronald Reagan died because John Hinckley, Jr. shot him.

This is false, yet the explanandum (Reagan died) and the explanans (Hinckley shot Reagan) are true. A substantive constraint on explanation will specify some condition that a because-claim such as this fails to satisfy.

However, GENERALISM requires that these constraints be not only substantive, but also domain-invariant. A domain appears to be a field of inquiry, and while Nickel recognizes that these fields can be divided more coarsely or finely (pp. 306–307), the coarsest classification of domains that he offers consists of science, mathematics, and ethics (passim). In our estimate, this is Nickel’s boldest claim, as many contemporary theorists of explanation deny that substantive domain-invariant explanatory constraints exist.<sup>3</sup>

For instance, many of these theorists would claim that (\*) is false because Hinckley’s gunshot did not *cause* Reagan to die. However, as Nickel rightly notes, causal considerations cannot impose domain-invariant constraints on because-claims, as people also use these claims in domains that are decidedly non-causal, e.g. mathematics. Unsurprisingly, causal theorists of explanation restrict the scope of their analysis, granting that a different theory of explanation is required for mathematics than for empirical science.

Importantly, Nickel does *not* provide a direct or positive argument for GENERALISM. Instead, he provides an indirect or negative one: the only two possible alternatives to GENERALISM—what he labels MODERATION and SKEPTICISM—are “mistaken” (p. 309). Hence, by elimination, GENERALISM is correct: there are substantive and domain-invariant constraints on explanatory information. While Nickel sometimes refers to asymmetries as being *due* to context-invariant constraints (p. 307), he does not provide even a rough characterization of the *content* of such constraints. Since he remains silent about that, his *only* argument is (and can be) that since MODERATION and SKEPTICISM are false, GENERALISM is true.

Nickel’s formulations of the moderate and skeptic position require slight clarifications for this argument to be valid. As stated, they are:

**MODERATION** Different domains of inquiry require different modes of explanation (p. 306).

<sup>2</sup> More precisely, Nickel is agnostic as to whether explanations are true because-claims or true and correct answers to why-questions. However, because “truth-conditions are inherited by the conditions because-claim has to satisfy in order to be a true and direct answer to a salient why-question” (p. 310), nothing in his or our argument hinges on this distinction. For economy of prose, we will write as if explanations are true because-claims.

<sup>3</sup> Achinstein (1983, Chap. 5) is perhaps the most systematic argument on this front, though many others have simply asserted this ‘explanatory contextualism’ without argument.

**SKEPTICISM** There is no such thing as distinctively explanatory information. Hence, there can be no theory of explanation (p. 307).

So characterized, MODERATION is compatible with GENERALISM, as there can be general explanatory constraints across domains (e.g., that the explanandum and the explanans must be true) even though each of those domains requires a different mode of explanation. As Nickel makes clear later, he has a stronger form of the moderate position in mind: “The crucial aspect of MODERATION is the commitment that across domains, we can give no substantive account of what makes something an explanation.” (p. 306) This qualification may be read in at least two different ways depending on whether ‘across domains’ means “across *any two* domains” or “across *all* domains”. Thus, we have two candidates for Nickel’s characterization of moderation (the second being more ambitious than the first):

**MODERATION\*** Within domains there are substantive constraints on explanatory information, but there are no such constraints common to *all* domains.

**MODERATION\*\*** Within domains there are substantive constraints on explanatory information, but there are no such constraints common to *any two* different domains (natural science, mathematics, ethics, ...).

This ambiguity is not damaging *per se*. Nickel explicitly conceives of his MODERATION as a label covering many possible positions: “[t]hus, moderate views can be arranged along a spectrum.” (p. 307). Still, the ambiguity is crucial, for as we will see, Nickel’s defense of GENERALISM requires the denial of MODERATION\*, but he only provides—at best—a denial of MODERATION\*\* (which does not entail that we should reject MODERATION\*).<sup>4</sup>

Nickel’s characterization of skepticism needs similar clarifications. It’s at least unclear what it means for there to be no “distinctively explanatory information.” After all, moderates will claim this much when we are comparing explanatory information between, e.g. mathematics and empirical science. Nickel wants SKEPTICISM to be stronger and incompatible with MODERATION\*, in that SKEPTICISM denies invariant constraints even *within* domains.<sup>5</sup> This suggests the following modification:

**SKEPTICISM\*** There is no such thing as distinctively explanatory information within or across domains.

Nickel sometimes refers to SKEPTICISM as an “extreme form” of MODERATION (p. 309; cf. our footnote 5), meaning that the skeptic expects theorists of explanation to be stymied in “identifying a common core of what makes something an explanation

<sup>4</sup> Towards the end of his paper, Nickel admits that he has not shown that MODERATION is false (p. 322). He attributes this to the fact that he has left the moderate position relatively vague (cf. the spectrum of possible moderate positions alluded to) and claims that he has provided a strategy for testing specific claims the moderate might make (p. 322). In our view the problem is not that his characterization of the moderate position is vague; the main problem is that his strategy does not work (see Sect. 5.1 below).

<sup>5</sup> Nickel defines SKEPTICISM as a special case of (and hence compatible with) MODERATION (p. 307), but it is clear he would also consider it incompatible with the stronger position MODERATION\*.

in even the smallest of domains, except in the trivial case where we address a single phenomenon on a particular occasion” (p. 307).

Given these formulations, skepticism might appear very implausible, as commonalities between explanations abound. However, recall that Nickel only cites the *semantics* of because-claims as a source of *substantive* explanatory constraints. Thus, barring any other sources, the above only requires the skeptic to say that any nontrivial commonality of explanatory constraints is the result of contingent (or non-semantic) factors. Nickel mentions the “interests that we bring to the table that go beyond simply our interest in an explanation” (p. 307) as one kind of contingent factor, and grants that a “skeptic can agree that we often look for a specific kind of information, perhaps even in most cases. But that fact, if it is a fact, is due to interests that go beyond our interest in an explanation” (p. 315). In other words, for the skeptic, any commonality in our explanatory constraints is a contingent feature of our extra-explanatory interests rather than a necessary consequence of all true because-claims. For instance, against the moderate causalist, the skeptic might claim that our interest in prediction and control is why we seek causal explanations across so many sciences.

With these clarifications in hand, MODERATION\* and SKEPTICISM\* are now the mutually incompatible and jointly exhaustive alternatives to GENERALISM that Nickel needs to argue against to establish the latter. His argument proceeds by elimination, viz.

#### PRO-GENERALISM

- (PG1) Either MODERATION\*, or SKEPTICISM\*, or GENERALISM is true.  
 (PG2) SKEPTICISM\* is false.  
 (PG3) MODERATION\* is false.

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(C) Therefore, GENERALISM is true

Having characterized the three contenders as being mutually exclusive and jointly exhaustive, Premise (PG1) is granted. Note that if we substitute MODERATION\* with MODERATION\*\* in (PG3), then the argument is formally invalid; and if we make it valid by also substituting MODERATION\*\* for MODERATION\* in (PG1), then this premise is no longer true, for not-MODERATION\*\* (together with not-SKEPTICISM\*) is compatible with not-GENERALISM, namely when there are constraints common to two domains  $D_i$  and  $D_j$  which are not common to all domains. Thus, Nickel’s crucial step is to demonstrate that Premises (PG2) and (PG3) hold. We now turn to the details of his argument.

### 3 Nickel on asymmetry

Nickel uses cases of explanatory asymmetry as an illustration of the workings of a substantive and context-invariant constraint on explanation (p. 307). He offers the following example:

- (1) a. The moon appears there because it was at location  $l$  earlier.

b. The moon appears there because it will be at location  $l'$  later.

Nickel claims that “we are happy to accept (1a), but ... reject (1b)” (p. 310). This asymmetry, he adds, is “due to context-invariant constraints” (p. 307), to wit “a context-invariant component to the truth-conditions of because-claims” (p. 311). Moreover, “[c]onsidering the centrality of explanatory asymmetries in adjudicating between theories of explanation, this ... amounts to saying that a *substantive* constraint on explanation is context-invariant” (p. 311).

Nickel’s “first order of business is to argue that the asymmetry in the acceptability of ... (1a) and (1b) is due to a difference in truth-value” (p. 311). If the asymmetry in acceptability were not the result of different truth-values, then asymmetry would not be due to a *semantic* constraint on explanations, and might well be the result of domain-specific criteria.

However, Nickel’s argument on this front is inadequate. He argues that the negation of (1b),

(2) It is not the case that the Moon appears there because it will be at location  $l'$  later, “is *completely acceptable*, which means that it must be true. Therefore, the negated sentence (1b) must be false” (p. 311, our emphasis). Yet, for this example to provide the desired support, the same move must *not* apply to (1a). Otherwise, the two claims are perfectly symmetrical with respect to their truth-value.

However, a parallel treatment of (1a) is readily available. To see this, suppose that we are comparing Newtonian dynamics and Keplerian celestial kinematics. On most accounts of explanation, the former is genuinely explanatory, but the latter is merely descriptive.<sup>6</sup> Now, suppose that someone asserts the following negation of (1a):

(2\*) It is not the case that the Moon appears there because it was at location  $l$  earlier.

If (2\*) does not elliptically include dynamical information, then it is arguable that (2\*) is “completely acceptable.” Hence, by parity of reasoning, (1a) is false. Consequently, Nickel has not adequately established that asymmetries of the sort exhibited by (1a) and (1b) result from a difference in truth-values. Since this was a necessary condition for asymmetry considerations to provide evidence of GENERALISM, and since asymmetry is Nickel’s only example, it’s unclear what would be a plausible illustration of the workings of a substantive, domain-invariant constraint. (Of course, Nickel can *stipulate* that Keplerian kinematics must be explanatory so as to safeguard his generalist stance, yet we take it that this would be much too high a price to pay.)

Moreover, there are plausible reasons to think that whether explanations are (or should be deemed) asymmetric, is context-specific. Even within the domain of science (where an explanation like (1a) is most at home), asymmetry constraints are not necessary in all contexts. As a result, any argument to the effect that the asymmetry between (1a) and (1b) is due to context-invariant constraints should be shunned. Consider the ideal gas law:

<sup>6</sup> One well-known exception is Hempel’s D-N model of explanation. If Kepler’s generalizations qualify as covering laws, then the adherent of the D-N model should count (1a) as a genuine explanation and (2\*) as false. But the same would hold for her stance regarding (1b) and (2).



$$PV = NkT$$

Here,  $P$  is the pressure,  $V$  is the volume,  $N$  is the number of particles in the gas,  $k$  is the Boltzmann's constant, and  $T$  is the temperature. For a given container with a gas in equilibrium, the pressure, temperature, and volume variables can be explained in terms of each other. For example, one can say that “the pressure is such-and-so because the volume and temperature are so-and-so.” Yet at the same time one can also claim that “the temperature is such-and-so because the pressure and volume are so-and-so.”

Of course, even if *asymmetry* is not a domain-invariant phenomenon, and hence not due to substantive, domain-invariant constraints, it can still be the case that such constraints exist. While Nickel hasn't identified what these constraints might be, PRO-GENERALISM doesn't rely on their identification. Consequently, GENERALISM could still be well supported by argument if objections to Nickel were to stop at this point.

To that end, Nickel argues that skeptics and moderates can only account for the differences in our attitudes to (1a) and (1b) by undertaking “semantic commitments” that are “untenable” (p. 307). According to Nickel, the most modest semantic commitments that moderates and skeptics can undertake are:

TRUTH (FINAL)  $p$  because  $q$  is true with respect to a context  $C$  iff

- i.  $\langle p \rangle$  is true with respect to  $C$ , and
- ii.  $\langle q \rangle$  is true with respect to  $C$ , and
- iii. the proposition expressed by  $\langle q \rangle$  with respect to  $C$  addresses the contrast salient in  $C$ , and
- iv. the proposition expressed by  $\langle q \rangle$  with respect to  $C$  satisfies the relevance relation salient in  $C$  (p. 314).

Here, a contrast is salient in a context if  $p$  because  $q$  is elliptical for  $p$  rather than  $x$  because  $q$  in that context, and a relevance relation  $R$  is salient in a context only if  $p$  rather than  $x$  because  $q$  entails  $q R \langle p, x \rangle$  in that context.

According to Nickel, the moderate and the skeptic should accept TRUTH (FINAL), because they embody the weakest assumptions that make the semantics of because-claims context-sensitive (and hence not domain-invariant) in a way that is incompatible with GENERALISM.

PRO-GENERALISM hinges primarily on the conditions (iii) and (iv) of TRUTH (FINAL), but let us briefly remark on conditions (i) and (ii). It appears that Nickel takes these conditions to be uncontroversial, and hence available to generalists, moderates, and skeptics alike. The generalist can accept them, because the reference to context  $C$  in these conditions is only to allow that  $\langle p \rangle$  and  $\langle q \rangle$  “may themselves contain context-sensitive expressions, such as tense” (p. 312). Conversely, it appears that Nickel assumes that skeptics and moderates would grant the truth requirements in conditions (i) and (ii) because they are trivial (and hence not substantive). As he observes, if these were the only domain-invariant constraints on because-claims, they would “make ‘because’ equivalent to ‘and’” (ibid.)



While we will not broach this issue here, several authors have questioned these two conditions. For example, critics of Inference to the Best Explanation would not grant that correct explanations must have true explanantia, and hence would deny condition (ii) of TRUTH (FINAL). Similarly, condition (i) is at odds with the significant literature on idealization and approximation suggesting that (strictly) false explananda can still figure in correct explanations.<sup>7</sup> If these challenges are well motivated, then Nickel is wrong to take these conditions as uncontroversial. However, we shall bracket these worries, and grant Nickel the assumption that these two conditions are true, but do not entail GENERALISM.

Returning to the bigger picture, Nickel's remaining arguments serve to establish the premises (PG2) and (PG3) of PRO-GENERALISM. They aim to show, contra TRUTH (FINAL), that the semantics of because-claims is not context-sensitive in a way that refutes GENERALISM. As we shall argue, rejecting TRUTH (FINAL) incurs substantially higher burdens of proof than Nickel shoulders. Those in the market for a general theory of explanation would do well to keep these rising costs in mind.

#### 4 Nickel versus SKEPTICISM\* (PG2)

Regarding TRUTH (FINAL), skeptics differ from moderates in denying that the relevance relation is semantically constrained even *within* domains (p. 315). According to Nickel, this difference implies that skeptics accept, while moderates reject, the following claim:

PERMISSIVENESS Neither what it is to address a contrast, nor the possible relevance relations, are semantically constrained, *nor do they constrain each other* (p. 315, our italics).

The last clause—that contrasts and relevance relations are mutually constraining—is “what makes for the difference between a skeptic and a moderate” (p. 315). For instance, Nickel argues that if skeptics allowed that “when the contrast is between two events studied by natural science, the relevance relation is constrained to be causation” (p. 315), then they would simply be moderates who held that causal explanations are appropriate in natural-scientific domains. This argument is curious, as presumably the skeptic and the moderate could both accept this causal dictum in natural science while disagreeing about whether or not it amounts to a *substantive* constraint. In particular, skeptics might deny that causation is a genuinely *semantic*—as opposed to a merely pragmatic—constraint on explanation. (Again, recall that Nickel only cites the *semantics* of because-claims as a source of *substantive* explanatory constraints.) Consider what van Fraassen (1980, Chap. 5), Nickel's exemplary (and only) skeptic (pp. 307, 309), says about this:

“the causal net = whatever structure of relations that science describes” (van Fraassen 1980, p. 124).

<sup>7</sup> There is substantial literature challenging both (i) and (ii) of TRUTH (FINAL), though (Cartwright 1983) is perhaps the best known text that challenges both of these conditions.

“no factor is explanatorily relevant unless it is scientifically relevant” (van Fraassen 1980, p. 126).

Consequently, a skeptic could hold that when two events are studied by natural science and contrasted for the purposes of explanation, the relevance relation must be causal, but that causation is an artifact of our scientific practices. But let’s grant Nickel this point for the sake of argument.

The bulk of Nickel’s argument against skepticism focuses on the claim that “once we fix a salient contrast, there is no further contextual variability in the interpretation of because-claims. If that is right, then the final clause of PERMISSIVENESS fails, and hence SKEPTICISM fails as well” (p. 315). This principle, that ‘contrast fixes relevance’ (CFR), also plays an important role in his arguments against the moderate. In this paper, we will not try to establish that CFR is false, yet we will show that Nickel’s argument for CFR is flawed.

Nickel starts this argument by considering “the best-case example the skeptic can point to. These are sets of sentences that differ in their acceptability in different contexts, even though they address the same contrast” and then argues “that in these examples, we have no evidence for the relevant context-sensitivity. Hence, we have no reason to believe in such context-sensitivity.” (p. 316).

He begins with the following pair of because-claims as a paradigm case for the skeptic:

- (5) a. The conductor warped because a strong current went through it.  
b. The conductor warped because it was in the Earth’s magnetic field.

He continues, “[i]ntuitively, there are contexts in which (5a) is a better thing to say than (5b) is, and there are contexts in which the opposite is true. [...] This difference in acceptability cannot be due to a difference in salient contrasts, since the two responses address the same one” (p. 316).

Let C1 and C2 be a pair of such contexts. Nickel then argues that despite appearances, “(5a) and (5b) are true with respect to [both] C1 and C2, [in which] case we do not have any reason to believe that once we have fixed the salient contrast (as we have for (5a) and (5b)), there are any other contextually variable elements to the interpretation of these sentences (p. 317). More precisely:

#### ANTI-SKEPTICISM\*

- (AS1) If (5a) is better in context C1 and (5b) is better in context C2, but it is nevertheless the case that both are true in both contexts, then there is no reason to endorse SKEPTICISM\*.  
(AS2) (5a) is better in context C1 and (5b) is better in context C2.  
(AS3) (5a) and (5b) are both true in both C1 and C2.

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- (C) There is no reason to endorse SKEPTICISM\*.

Premise (AS2) is true by assumption, so we will not question it here. There are both minor and more fundamental problems with (AS1). The minor difficulty is that its consequent, and thus the conclusion of the argument, is not that SKEPTICISM\*

is *false*, but only that it is *unmotivated*.<sup>8</sup> If the consequent were that SKEPTICISM\* is false, then (AS1) would be false, for the antecedent does not imply the *falsity* of SKEPTICISM\*. But strictly speaking, PRO-GENERALISM needs as a premise that SKEPTICISM\* is false. Nevertheless, we still grant that the absence of reasons for SKEPTICISM\* (and MODERATION\*) suffices for Nickel’s case. Thus, we will not rebut Nickel’s ANTI-SKEPTICISM\* on this point. Instead, we will argue that (AS3) is only warranted *and* (AS1) is only true if Nickel assumes precisely what the skeptic would deny: namely that contrast fixes relevance.

To see this, consider that Nickel argues for (AS3) by considering the conjunction:

- (6) The conductor warped because a strong current went through it and because it was in the Earth’s magnetic field (p. 317).

This is “clearly acceptable, and hence true” (p. 317). Then he considers one way of accounting for the truth of (6) that, according to him, implies that (5a) and (5b) are true in both C1 and C2:

...the whole conjunction is evaluated with respect to the single context—call it C3—and hence one in which all the context-sensitive elements of (5a) and (5b) receive the same interpretation. If that is true, then the following argument holds. *C1 and C3 agree on how to interpret (5a). C2 and C3 agree on how to interpret (5b).* And C3 is such that the context-sensitive features of (5a) and (5b) are interpreted the same way. Thus, C1 and C2 agree on how to interpret both (5a) and (5b). So if (5a) is true with respect to C1, it’s also true with respect to C2, and if (5b) is true with respect to C2, it’s also true with respect to C1 (p. 317, our emphasis).

If sound, this argument establishes (AS3), which in turn would go some ways toward establishing the conclusion of ANTI-SKEPTICISM\*. If the skeptic does not like this result, then it seems that she has to provide another account of the truth of (6). By our lights, such an alternative account is not needed to defend SKEPTICISM\*, as the truth of (6) does not imply (AS3) without already begging all of the important questions against the skeptic. The crucial step is the one we have emphasized in italics.

While anyone should grant that C1 and C3 agree on the *truth* of (5a), why would a skeptic also grant that C1 and C3 agree on *how to interpret* (5a)? (Ditto for C2 and (5b)). That would require some independent reason to believe the following:

- (+) If two contexts agree on the truth-value of a because-claim, they agree on how to interpret that because-claim.

Furthermore, the only contextually variable parameters in TRUTH (FINAL) are contrasts and relevance relations, and contrasts are held fixed in the example involving (5) and (6). Consequently, when Nickel assumes that C1 and C3’s agreement on the truth-value of (5a) entails their agreement on how to interpret (5a), he is assuming that C1 and C3 interpret (5a) using the same *relevance relation*, i.e. that

- (++) If two contexts agree on the truth-value of a because-claim that addresses the same contrast in both contexts, they agree on how to interpret the relevance relation of that because-claim.

<sup>8</sup> Recall Nickel’s quote from above: “Hence, we *have no reason to believe* in such context-sensitivity.”

But this just means that contrasts constrain relevance relations. Hence, far from proving that contrast fixes relevance, Nickel has simply presupposed it! This circularity has ramifications that undermine ANTI-SKEPTICISM\* at every turn. First, observe that the example involving (5) and (6) was supposed to justify (AS3), which in turn was supposed to show that SKEPTICISM\* was unmotivated. However, (AS3) is only justified by the example involving (5) and (6) if (++) is assumed. Since (++) is a notational variant of CFR, and the latter is, to repeat, precisely “what makes for the difference between a skeptic and a moderate” (p. 315), Nickel’s argument amounts to nothing more than the claim that if the main reason not to be skeptical is true, then there’s no reason to endorse SKEPTICISM\*.

Similarly, (AS1) presupposes a similar anti-skeptical dogma: (5a) and (5b) can involve different interpretations of their relevance relations in C1 and C2, even though they both excel in their respective contexts, and are both true in both contexts. Hence, absent (++) , there at least *could be* a reason to endorse SKEPTICISM\*.<sup>9</sup> So, (AS1) is false unless cross-contextual agreement on the truth-values of (5a) and (5b) implies a parallel agreement about how to interpret relevance relations. In other words, (AS1) presupposes CFR, so the skeptic has no obligation to accept it.

Perhaps there are some independent reasons for endorsing (++) , but Nickel has not provided them. The most compelling reason of this sort would be that the skeptic has no way to account for different contexts’ agreement of truth-values without assuming that they agree about interpretations. However, since different interpretations of relevance relations can make the same because-claim true, there is a fairly straightforward model that is consistent with SKEPTICISM\* and which makes sense of Nickel’s example:

- (1) (5a) is true with respect to C1, where C1 interprets (5a) as: A strong current went through the conductor R<sub>1</sub> (The conductor warped, x)
- (2) (5b) is true with respect to C2, where C2 interprets (5b) as: The conductor was in the Earth’s magnetic field R<sub>2</sub> (The conductor warped, x)
- (3) (6) is true with respect to C3, where C3 interprets (6) as:
  - a. A strong current went through the conductor R<sub>3</sub> (The conductor warped, x), and
  - b. The conductor was in the Earth’s magnetic field R<sub>3</sub> (The conductor warped, x)
- (4) Finally, R<sub>1</sub> ≠ R<sub>2</sub> ≠ R<sub>3</sub> ≠ R<sub>1</sub>.

This example suffices to show that Nickel’s assumption of (++) is something that the skeptic needn’t grant.

To be sure, Nickel argues that this kind of alternative is implausible. On his view, if the skeptic’s account were true, “there must be some mechanism that forces the context to shift” from C1 and C2 to C3 (p. 317). He then shows that accommodation, which occurs when “an assertion is made that is true only if the context satisfies certain conditions, and the context changes so as to make the assertion come out true,” is the

<sup>9</sup> It would obviously take us too far afield to discuss the conditions under which reasons exist, but if this simply means that there is some way of accounting for (5) and (6) that coheres with SKEPTICISM\* , (AS1) is patently false.

most plausible mechanism that accounts for this shift, yet that it does not accord very well with the linguistic data.

We do not object to Nickel's claim that accommodation does not accord with linguistic evidence. Rather, we take Nickel once again to have begged the question. Skepticism only denies the existence of distinctively explanatory information within or across domains. This does not entail anything about the existence of mechanisms that force context-shifts. Consequently, it is at least *consistent* to be a skeptic while remaining agnostic about the existence of context-shifting mechanisms like accommodation.

Furthermore, the skeptic may be *principled* in adopting this stance. Nickel's use of the word "mechanism" appears to be synonymous with "explanation." If correct, this saddles the skeptic with a "second-order" commitment to explain why explanatory contexts shift. But since skeptics think that explanatory contexts vary significantly, they are not likely to think that there is anything to explain here.

In summary, the primary point of differentiation between SKEPTICISM\* and the alternatives, MODERATION\* and GENERALISM, is that only skeptics deny that contrast fixes relevance, CFR. However, it turns out that Nickel's argument, ANTI-SKEPTICISM\*, presupposes the truth of CFR, and hence begs all of the important questions against the skeptic. Hence, Nickel has done nothing to rule out SKEPTICISM\*, and PRO-GENERALISM's soundness is already in jeopardy. More colorfully, the hidden cost of a general theory of explanation appears either to be an independent justification for contrasts fixing relevance relations, and this cost may well be prohibitive; or some hush money to persuade the skeptic to give up his views without any argument, and this transaction may well be prohibited.

## 5 Nickel versus MODERATION\* (PG3)

Nickel's crusade against MODERATION\* also starts from the assumption that 'contrast fixes relevance' (CFR). We shall temporarily bracket the previous section's verdict on Nickel's argument for CFR for the purposes of exposition. Now, if contrast fixes relevance, then "[if] we can find a pair of [true] because-claims that are interpreted with respect to the same contrast and that mention potentially explanatory information from [different domains] D1 and D2, respectively, [then] we should reject the moderate's claim about D1 and D2" (p. 322). In other words, assuming that contrast fixes relevance, the same contrast implies the same relevance relation. So, if there are explanations from different domains that address the same contrast, it follows that explanations in different domains have the same relevance relation. Hence, we are invited to believe that MODERATION\* is false.

Nickel provides two examples of explananda with the same contrasts addressed by explanantia from different domains (p. 322):

- (14) a. Sue knocked on the door (rather than not) because she wanted to go inside.
- b. Sue knocked on the door (rather than not) because it would have been rude not to.
- (15) a. After entering '2 + 2 =,' the calculator showed '4' (rather than some other number) because it is wired in such-and-such way.

- b. After entering ‘ $2 + 2 =$ ,’ the calculator showed ‘4’ (rather than some other number) because  $2 + 2 = 4$ .

In (14a), an intentional action explanation is offered; (14b), a moral (or social-normative) one; (15a), causal; (15b), mathematical. Thus, it appears that when we keep the contrast fixed, explanations from multiple domains are nevertheless possible. If contrast does indeed fix relevance, then these four forms of explanation enjoy a common relevance relation. Here is Nickel’s argument:

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(AM1) (14) and (15) each present pairs of true because-claims that come from different domains, but which address the same contrast (p. 322).

(AM2) If two true because-claims address the same contrast, they involve the same relevance relation (p. 315).

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(AM3) So the because-claim in (14a) involves the same relevance relation as the one in (14b); and likewise, the because-claim in (15a) involves the same relevance relation as the one in (15b).

(AM4) If the because-claim in (14a) involves the same relevance relation as the one in (14b); and/or the because-claim in (15a) involves the same relevance relation as the one in (15b), then MODERATION\* is mistaken.

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(C) So MODERATION\* is mistaken.

We object to Nickel’s argument in several ways:

### 5.1 Against (AM1)

First of all, we deny that Nickel’s examples do the job they are required to do. We contend that in these examples:

- (14b) and (15b) can be false or have indeterminate truth-values, or
- (14b) and (15b) are both true, but are in the same domain as (14a) and (15a) respectively, or
- (14b) and (15b) are both true, but tacitly imply a different contrastive explanandum than (14a) and (15a) respectively.

If (14b) does not elliptically include information about Sue’s beliefs or desires, it can be false. To see this, observe that if it’s rude not to knock, but *Sue is either unaware or indifferent to this social convention*, then (14b) is false even if, as a matter of fact, Sue knocks on the door. Similarly, if (15b) is not meant to elliptically include information about the wiring of the calculator, it can be false as well. If *the calculator is wired improperly* so that it is mostly unreliable, then (15b) is false even if, as matter of fact, the calculator showed ‘4’. Hence, the truth-value of (14b) depends on what Sue believes and desires; and the truth-value of (15b) depends on the way the calculator is wired. Without any information about Sue or the calculator’s wiring, the truth-values of (14b) and (15b) are indeterminate.

Two related worries may arise here.<sup>10</sup> First, wouldn't the proverbial person on the street be prepared to accept the truth of (14b) in the absence of any information concerning Sue's unawareness or indifference (and likewise for 15b)? We are happy to grant this point, but think that it speaks against GENERALISM. People frequently make implicit assumptions when judging explanatory claims, but this is just to say that context affects relevance relations. In contexts where Sue's unawareness or indifference is not considered relevant, (14b) is liable to be true. However, the same cannot be said of contexts in which Sue's unawareness or indifference is considered relevant. In this case, ignorance about Sue's mental states leads to the aforementioned indeterminacy of (14b)'s truth-value; knowing that Sue lacked any concern for rudeness makes (14b) false.

A second worry is that because our objection requires (14b) not to elliptically include information about Sue's beliefs and desires, we are unfairly leveraging an overly demanding notion of 'complete and unelliptical' explanation against Nickel. On the contrary, the information in the ellipsis is highly circumscribed and perfectly relevant given the dialectic at hand. One clear cut test of Nickel's claim that (14) and (15) present pairs of because-claims that are from *different domains* is that information from one domain doesn't affect the truth-value of the explanation in the other domain, e.g. the truth/falsity of explanations in the same domain as (14a) does not affect the truth/falsity of (14b). That's the only bit of "elliptical" information our argument requires. Consequently, Nickel is welcome to offer some other criterion for delimiting domains, but since he hasn't done so, there are dialectically solid reasons for resisting his assumption that (14) and (15) offer explanations from different domains.

Returning to our objections to (AM1), the natural reply is simply to stipulate additional explanatory information, i.e.

- (14) c. Sue knocked on the door (rather than not) because *she correctly believed that it would have been rude not to and she desired not to be rude.*
- (15) c. After entering ' $2 + 2 =$ ,' the calculator showed '4' (rather than some other number) because  $2 + 2 = 4$  *and the calculator is properly wired to physically implement the  $+$ -arithmetic rules.*

But now, (14c) includes an intentional-action explanation just like (14a), and (15c) includes a causal explanation about the workings of the calculator just like (15a). Thus, we've moved from our first objection to (AM1) straight into our second objection of (AM1)—these explanation-pairs are now in the same domain: (14a) and (14b) are both in a natural science (psychology); (15a) and (15b) are both in another natural science (engineering?).

The only other way we can see to preserve the truth of (14b) and (15b) is to change the explanandum. For instance, Risjord (2000) has argued that social norms are explanatory without reference to individual intentions when the explananda are group-level phenomena. This might suggest the following:

<sup>10</sup> We would like to thank an anonymous referee for raising these worries.



- (14) d. Westerners knock on the door before entering a room because it is rude not to.

Perhaps a similar move can be made for (15), but quite clearly, doing this is completely self-defeating from the perspective of arguing for GENERALISM via ANTI-MODERATION\*. Nickel needs explanantia from different domains for the same contrastive explanandum. Hence comparing because-claims with different explananda—such as (14a) and (14d)—would not help his cause.

## 5.2 Against (AM2)

(AM2) is an instance of CFR, the argument for which we have criticized in Sect. 4. Admittedly, we have not shown that CFR is false. Furthermore, in Sect. 4, we objected to CFR on the grounds that it begs the question against the *skeptic*. Strictly speaking, assuming CFR does *not* beg the question against *moderates*, as they accept CFR—but *only* inasmuch as the contrast is addressed within a given domain.

Nevertheless, parallel points to the ones presented above apply. ANTI-MODERATION\* only succeeds if the following is assumed:

- (+++)  
If the same contrast is addressed in different domains, then the relevance relation for that contrast is fixed across domains.

The moderate need not (and should not) grant Nickel this much.<sup>11</sup> As with his discussion of SKEPTICISM\*, Nickel merely presupposes that for which he needs to argue. In this case, it is that contrasts *across domains* fix relevance. To assume this is simply to beg questions against the moderate. Hence, unless and until Nickel provides a new, noncircular justification for (+++), (AM2) should be treated as too shaky a premise.

## 5.3 Against (AM4)

(AM4) is false. A moderate may accept (intentional) constraints common to psychology and ethics, for instance if naturalistic assumptions in ethics are included, and still claim that these intentional constraints are not present in, say, physics. And she even may accept common constraints in physics and mathematics, e.g. unificatory constraints, and claim that they do not apply to ethics, or philosophy. In short, the antecedent of (AM4) is compatible with MODERATION\*. Of course if we replace MODERATION\* by MODERATION\*\* in the consequent, then (AM4) becomes true. But then, as we advanced in Sect. 2, the conclusion (in case the other premises

<sup>11</sup> The moderate's counter-model to Nickel runs as follows:

- (14a) is true with respect to  $D_{psychology}$ , where  $D_{psychology}$  interprets (14a) as: Sue wanted to go inside  $R_{psychology}$  (Sue knocked on the door, Sue did not knock on the door); and  
(14b) is true with respect to  $D_{ethics}$ , where  $D_{ethics}$  interprets (14b) as: It would have been rude not to knock on the door  $R_{ethics}$  (Sue knocked on the door, Sue did not knock on the door)

Here the subscripts indicate that different domains have distinct criteria of explanatory relevance. (Ditto for (15a) and (15b), with engineering and mathematics specifying the respective domains and the relevance relations).

be granted) is not that MODERATION\* is false but just that MODERATION\*\* is false. This is insufficient for Nickel's PRO-GENERALISM argument.

In summary, we offer further words of caution to would-be generalists who are shopping for a theory of explanation. First, don't be fooled by false advertising: examples such as (14) and (15) are not what they appear. Second, the move from skepticism to moderation does not lower the price of arguing for CFR. Third, make sure that you get what you pay for—a position built on denying MODERATION\*\* might not be generalism upon closer inspection.

## 6 Conclusion

Thus, we have seen that Nickel's defense of GENERALISM fails at several key stages in his arguments. Asymmetry, which was supposed to illustrate a substantive and domain-invariant constraint on explanation, turned out to be context-specific, and no other candidates for such grandiose constraints were offered. SKEPTICISM\* was supposed to be a dead end, but Nickel could only argue for this with highly contentious premises that might well beg all of the important questions against the skeptic. Moreover, one of the most central claims in Nickel's argument—that contrast fixes relevance—rests on exactly the same contentious assumptions. Finally, MODERATION\* is none the worse for wear, as Nickel's alleged counterexamples to it seem fraught with difficulties.

Nickel's strategy is extremely fragile. Since his argument for GENERALISM requires *both* his argument against SKEPTICISM\* *and* his argument against MODERATION\* to be sound, it suffices for our purposes if only one of our objections to his arguments is sound (of course we believe that *all* of them are sound). It is worth repeating that, to our knowledge, Nickel's is the *best* argument for a general, domain-invariant theory of explanation. Given its shortcomings, there is no reason to answer the question, "How general do theories of explanation need to be?" with a stronger answer than "Not terribly general". As a result, the current emphasis on domain-specific explanations seems to be justified, and philosophers interested in explanation should feel little pressure to seek some underlying unity in explanations across domains as disparate as physics and ethics.

While it's no part of our argument against Nickel, we end with perhaps the most important question of all. What's to be *gained* by having domain-invariant constraints on explanation? Will they help the scientist to uncover causes, the mathematician to formulate proofs, or the ethicist to tell us what's good? Here we think moderates and skeptics are at their strongest—these are the things that we ought to deem "substantive" constraints on our explanations—and generalists should take these questions as their primary challenges moving forward.

**Acknowledgments** José Díez' research for this work is part of the research project FFI2008-01580/CONSOLIDER INGENIO CSD2009-0056 (Spanish Ministry of Science). Bert Leuridan is Post-doctoral Fellow of the Research Foundation - Flanders (FWO). Part of the research for this paper was conducted at the University of Pittsburgh (Center for Philosophy of Science). We would like to thank the Center for Philosophy of Science, as well as Peter Vickers and two anonymous referees for their helpful suggestions and criticisms.

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