Kalām and Cognition[1]

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One initially compelling feature of the *kalām* cosmological argument is its apparent simplicity.

1. Everything that begins to exist has a cause for its existence.
2. The universe began to exist.
3. Therefore, the universe has a cause for its existence (namely, "The First Cause").

Many hundreds of pages have been written about this little argument in the last few decades alone, and there's good reason to think the argument has been around since at least the sixth century CE (Shihadeh 2008, p. 206). The earliest formulation that I've studied appears in al-Ghazālī's book, *al-Iqtiṣād fī al-I'tiqād* (*Moderation in Belief*). But its most influential contemporary defender is probably William Lane Craig.[2]

Not too long after Craig's initial presentation of the argument, in 1979, it became the subject of a great deal of controversy in the Anglo-American philosophical community. Despite its apparent simplicity, the argument raises all sorts of questions about time, infinity, explanation, causation, modality, and the relationship between The First Cause and the universe (that is, the totality of space, time, and matter). Endorsing both premises requires taking a stand on some of the hardest questions in metaphysics, cosmology, and the foundations of mathematics.[3] So the argument's apparent simplicity belies a great deal of complexity. This might lead one to think that, even if sound, informed rational skepticism is possible. After all, knowledge in the relevant areas of metaphysics, cosmology, and mathematics is sufficiently equivocal to sustain decades of expert disagreement; how then can I (not really an expert, not quite a layman) justifiably take a stand where only the wise tread with caution?

This essay is a plea for skepticism, but one that approaches the issue in, perhaps, a slightly unorthodox way: not by the familiar observation that expert disagreement is incompatible with a high degree of confidence, but by the application of some recent work in cognitive science and philosophy of language. Briefly put, my central claim is that the credibility of the *kalām* argument's first premise rests on the *generic overgeneralization effect*—a fallacious mode of thought to which we all seem susceptible.[4] Insofar as the rejection of (1) is judged to be self-evidently untenable, friends of the *kalām*

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[2] The argument in *al-Iqtiṣād* is formulated in a way that reveals Avicenna's influence. Perhaps it's a bit misleading, then, to classify al-Ghazālī's argument as an early version of Craig's. Nothing important for my purpose turns on this question. Thanks to Fedor Benevich for bringing the issue to my attention.

[3] The papers collected in Copan and Craig (2018*a*; 2018*b*) demonstrate just how difficult these questions really are.

[4] See Leslie et al. (2011), Johnston and Leslie (2012), and Leslie (2017) for discussion. I'll have a lot more to say about this work momentarily.

argument are exploiting a stubborn cognitive vulnerability. Somewhat ironically, the claim's enduring appeal undermines its epistemic standing.

To be clear, my strategy isn't to *falsify* premise (1), but to *debunk* it. This means telling an empirically plausible story according to which its apparent truth derives from an erroneous or unreliable form of thought. To that extent, my project is continuous with a growing body of work exploring the ways in which cognitive science might constrain metaphysical inquiry (Goldman 2015; Goldman and McGlaughlin 2019). A clear and concise statement of the animating thought behind this work appears in Paul (2010): "...one role for cognitive science in ontology is to identify places where our ordinary judgments might not be appropriately generated, as with illusions" (p. 470). In the discussion that follows, I'll argue that the disposition to accept premise (1) probably isn't, in the relevant sense, "appropriately generated". Along the way, I'll sketch a picture that's manifestly coherent, empirically informed, and yet incompatible with the truth of (1). At no point will I argue that (1) is false. In a domain as contested as this one, it seems to me that ambitious deductive arguments are bound to be unconvincing. Better to sketch a picture and leave it to others to judge how appealing the picture is.

I've said my strategy is to debunk premise (1). There is, of course, a massive literature in contemporary epistemology about the mechanics of debunking arguments. Important questions have been raised about how, exactly, arguments of this kind are supposed to work.[5] What are the underlying principles on which they rely? I'm unable to engage with this literature in any detail here. As a result, the case for my central claim will be somewhat provisional, but not at all unique in this respect. Philosophical inquiry is typically provisional. Often, one is forced to bracket certain issues in order to address others. The hope is that, in the long run, things will work out.

A striking feature of the contemporary debate about the *kalām* argument is that, overwhelmingly, participants focus on the second premise.[6] For example, in their contribution to *The Blackwell Companion to Natural Theology*, Craig and Sinclair (2012) provide a comprehensive 101-page defense of the *kalām* argument in which only about six or seven pages are devoted to its first premise. And in their even more recent two-volume anthology on the subject—a collection of essays that's just under 700 pages in length—Copan and Craig (2018*a*; 2018*b*) reserve only about 60 pages for critical examination of the premise (and even many of these pages are concerned with peripheral issues). The presumption seems to be that the first premise is just self-evidently true. I say this is a "striking" feature of the contemporary debate because some of the most influential Muslim thinkers of the classical period (both before and after al-Ghazālī) rejected the presumption that premise (1) is self-evident. "Al-Juwaynī's *al-Shāmil*, for instance, testifies to the heated debates among the *mutakallimūn* about this principle" (Erlwein 2017, p. 43). In the *Metaphysics* of his *Shifā*, Avicenna

[5] White (2010) is an illuminating contribution to this debate.

[6] Two recent discussions of the second premise that I find particularly interesting are Malpas and Morriston (2020) and Malpas (2021).

claims that the principle requires proof.[7,8] And Fakhr al-Dīn al-Rāzī seems to have suspended judgment regarding its truth altogether.[9] In fact, according to Majid Fakhry, the *kalām* argument "was never viewed with favor in the Muslim world [...] since the very validity of the causal principle is challenged by the Mutakallims" (1957, pp. 135-136).[10,11]

My aim in writing this paper is to provoke a critical reexamination of premise (1). But that won't be possible unless the claim's hold over us is considerably weaker than it presently seems. So I want to encourage the somewhat skeptical frame of mind that was normal during the classical period of Islamic philosophy. To reiterate, the central claim for which I'm arguing is that the credibility of the *kalām* argument's initial premise issues from the generic overgeneralization effect. A natural place to begin the discussion, then, is with the science of generic thought. Once the idea of generic overgeneralization has been adequately unpacked (Section 1) and defended (Section 2), I'll explain how it bears on the argument that interests me (Section 3).

1. The Idea of Generic Overgeneralization

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[7] Bk. 1, ch. 1, p. 6 of the Marmura translation; though the translation in Erlwein (2017, p. 44) is a bit more lucid: "It is not self-evident (*bayyinan bi-nafsihi*), even if close to being self-evident to the mind, that originated things have some kind of principle for them."

[8] Remarkably, in *Ishārāt* V.9, Avicenna maintains that causes whose effects are eternal (*al-ibdā'*) are "nobler in rank than" (Inati 2014, p. 139) or "superior to" (Hassan 2020, p. 73) causes whose effects begin to exist. This suggests that, from Avicenna's point of view, the *kalām* argument represents The First Cause as less than maximally perfect.

[9] See Shihadeh (2008, pp. 206-207). Erlwein (2017) expresses a somewhat different opinion. She suggests that al-Rāzī wasn't agnostic about the principle's truth, but maintains that he "evidently does not belong to those who consider the validity of the principle of causation a self-evident matter..." (p. 44).

[10] See, also, Chittick (1998, pp. 16-20) and Hallaq (1991, pp. 49-56) for relevant discussion. A *mutakallim* (pl. *mutakallimūn*) is a practitioner of *kalām*, the Islamic tradition of systematic theology.

[11] According to al-Ghazālī, the initial premise of the *kalām* argument seems to be analytic: "The one who is not moved by [the claim, 'The occurrence of every occurrent has a cause',] is, perhaps, not moved because it is unclear to him what we intend by the term 'occurrent' and the term 'cause'. If he understood them, his mind would necessarily believe that every occurrent has a cause" (*al-Iqtiṣād*, p. 28). As this passage indicates, al-Ghazālī treats belief in the premise as a precondition for understanding it. A natural thought in the offing is that, if one can't so much as understand a claim without believing it, then the belief is, in some epistemically relevant sense, blameless (cf., Boghossian 2003). But it's highly doubtful that Avicenna, al-Rāzī, and other skeptical *mutakallimūn* failed to properly understand the initial premise of the *kalām* argument (cf., Williamson 2003); wherefore, one might criticize al-Ghazālī by simply quoting al-Ghazālī: "If you know this [premise] through the necessity of reason, how is it, then, that those who oppose you do not share this knowledge...? And these [individuals] certainly do not stubbornly defy reason..." (*Tahāfut*, p. 17). Ironically, this passage from the *Tahāfut* is part of al-Ghazālī's "refutation" of the belief (defended at length by Avicenna) that the world is eternal.

Generic sentences are constructions like *ravens are black*, *lions have manes*, and *sea-turtles are long-lived*.[12] These constructions are about the members of a certain genus or kind, but unlike sentences beginning with *all*, *every*, *most*, *many*, and *some*, generics lack an overt quantifier. They remain silent regarding how many members of the relevant kind have the property at issue; thus they express a distinctive form of generality that philosophers and linguists often call *genericity*.

The meaning of some generics is roughly preserved by the insertion of an adverb like *generally*, *typically*, or *normally* (as in: *generally, ravens are black*). But some generics express significantly weaker generalizations. For example, *sea-turtles are long-lived* is intuitively true, though *generally, sea-turtles are long-lived* is false. A female sea-turtle will typically lay between 1,900 to 2,300 eggs in her lifetime, and only a handful will survive to maturity. Some generic sentences express generalizations that are so strong that even if *every* member of the relevant kind were a conformer, the generalization would still be false. Consider, for example, *Supreme Court Justices have a prime Social Security number* (Cohen 2012). It's not part of the job description that members of the Court have prime Social Security numbers.

As the examples in the previous paragraph suggest, one salient feature of a generic sentence is that its truth tolerates exceptions.[13] But the exceptions can vary in prevalence. Only a minority of ravens are non-black (albinos, for example, are white); fewer than half of all lions lack manes (specifically, immature or unfortunate males, and just about every female); and almost all turtle hatchlings die shortly after birth. But these exceptions are, so to speak, harmless. The truth of the corresponding generic sentence remains intact. There's no pressure on us to give them up or to soften our commitment to them once we acknowledge the exceptions.

Generics raise many fascinating questions for philosophers, linguists, and cognitive scientists. One particularly important question is, what does their truth demand of the world? When is an exception harmless and when is it a genuine counterexample? More abstractly, what does genericity consist in? (Compare: what does universality consist in?) One would like a systematic answer, an answer that's not terribly disjunctive or piecemeal. But it's not clear how to simultaneously account for the strength of the strong generics and the weakness of the weak ones. They seem to push and pull in opposite directions. Expert opinion is largely divided, even about the appropriate method with which to pursue the inquiry.[14] It's no wonder, then, that a uniform theory remains elusive.

Interestingly, young children understand generic sentences before they develop an understanding of universally or existentially quantified sentences (Leslie 2007; 2008). One reason why this pattern of acquisition is interesting is that, from a theoretical perspective, universal and existential quantifiers are far more tractable. One can easily specify their meanings in simple set-theoretic terms.

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[12] Not all generics begin with a bare plural noun. For example, the following sentences have generic readings: *the tiger is a mammal*; *a madrigal is polyphonic*; *candy rots teeth*. (Compare these readings with the most natural interpretations of the following: *the tiger is sleeping on our front lawn*; *a madrigal is popular*; *candy is in that jar*.) For my purpose, we can ignore these cases. I'll focus entirely on generics beginning with a bare plural noun.

[13] *Generics tolerate exceptions* is itself a generic that tolerates exceptions: e.g., *triangles have three sides* and *conjunctions entail their conjuncts*.

[14] See, among others, Carlson and Pelletier (1995), Leslie (2007; 2008), Nickel (2016), and Sterken (2015*a*, 2015*b*, 2017).

(*Every F is G* is true if and only if the set of Fs is a subset of the set of Gs; *some F is G* is true if and only if the set of Fs intersects the set of Gs.) Here is how Leslie puts the point: "While generics have proved nigh intractable for theorists, they turn out to be a cakewalk for language learners. Young children engaged in learning their native language grasp and produce generics far more quickly and readily than they do explicitly quantified sentences" (Leslie 2008, p. 2).

Another reason why this pattern of language acquisition is interesting is that generics lack an overt marker. There's no explicit generic operator akin to *all* or *some*.[15] "The absence of a dedicated generic operator ought to make the acquisition of generics more difficult. Children are not even provided with an explicit object of study; there is no part of the sentence with which they could learn to associate the meaning of generics. Quantifiers like 'all' and 'some' are not only truth-theoretically simpler; they are actually articulated!" (p. 2) In general, children find it massively difficult to associate meanings with absences (p. 19, fn. 13). Even still, children start using generics by the time they're two years old, which is much earlier than their use of *all* and *some* (Gelman 2003).

How might we explain these remarkable facts? Here's one influential hypothesis: generic sentences are the language faculty's way of articulating an innately given and default system of generalization.

> That is, the cognitive system may have an automatic, early-developing way of generalizing information from individuals to kinds. These primitive kind-based generalizations are, according to this hypothesis, later articulated in language as generics. If correct, this hypothesis would explain why generics are understood and produced by young children, despite the semantic complexity that linguists have claimed generics exhibit. The generalizations expressed by ['all' and 'some'], in contrast, represent more sophisticated generalizations—not the primitive default one expressed by generics (Leslie et al. 2011, p. 16).[16]

This hypothesis derives considerable support from its predictive success. "For example, if understanding ['all' and 'some'] statements requires deviating from the default mode of generalization, then both children and adults should sometimes fail to execute this deviation, and so should incorrectly treat ['all' and 'some'] statements as generics" (p. 16). The idea behind this prediction is that default patterns of thought are automatic and, therefore, easier to engage in than nondefault patterns of thought. If just the right sort of pressure were introduced in context, a subject might lighten the cognitive load for himself by regressing to the default. One relevant sort of pressure that Leslie and her collaborators discuss is the difficulty in assessing universal generalizations. "It may be harder, though, for people to confirm that a universal statement is true, since they are only true if every single member of the kind has the property in question. Adults may thus save cognitive effort by relying on the generic to evaluate the universal" (p. 17). This sort of difficulty is only compounded

[15] Though, at a deeper level of syntactic analysis, linguists have posited a covert quantifier: *Gen*. For further discussion, see the debate between Liebesman (2011), Leslie (2015), Sterken (2016), and Collins (2018).

[16] The contributions of many other theorists are acknowledged in this passage. I've removed these citations to streamline my presentation. See, among others, Carlson and Pelletier (1995), Cohen (1996), and Gelman (2003).

when the universal generalization is as abstract and sweeping as the general premise in a cosmological argument. Be that as it may, the prediction to which I'm drawing attention is largely confirmed. Hollander et al. (2002) and Tardif et al. (2011) found that young children are highly disposed to treat sentences beginning with *all* and *some* as generics. More relevant for my purpose, researchers have observed statistically significant patterns of the error among informed adults, as well (Jönsson and Hampton 2006; Connolly et al. 2007; Khemlani et al. 2007; Leslie et al. 2011; Leslie and Gelman 2012).

The take-away point is this: competent language users are inclined to agree with some false universal generalizations when the corresponding generic sentences are true, despite knowing about the falsifying counterexamples (Leslie et al. 2011, pp. 17-18). Manifestations of this widespread tendency exemplify the generic overgeneralization effect. Sorensen describes the effect as follows: "Once you pick up a generic generalization you tend to wield it nearly as strongly as a universal generalization" (2012, p. 447).

Recent examination of the effect raises doubts about whether its experimental confirmation is conclusive, suggesting possible contextual interference (Lazaridou-Chatzigoga et al. 2017; 2019). However, even more recent experimentation vindicates the initial findings of Leslie and her collaborators, showing the effect to be robust in a wider range of cases, even cross-linguistically (Wajda and Karczewski 2020 and Karczewski et al. 2020). Further investigation is required, but the results to date are, at the very least, highly suggestive. At any rate, it's not clear that friends of the *kalām* argument should be relieved by the findings of Lazaridou-Chatzigoga and her colleagues, since even they indicate that subjects have a tendency to misinterpret universal generalizations, softening them so that *all* and *every* are roughly equivalent to *almost all* and *just about every*. My central claim can be reformulated accordingly.

Leslie (2007, pp. 394-397) persuasively embeds her theory of generic cognition in the dual-systems framework of Tversky and Kahneman (1982) and Kahneman (2012). This influential framework says that our judgments issue from two different systems of thought. System 1 is the default, automatic, effortless, unreflective, lower-level system that's largely screened off from one's total body of evidence. It delivers firmly held and difficult-to-abandon intuitions. System 2 is the slower, effortful, conscious, evidence-based, higher-level system. It can yield strongly counterintuitive judgments. Naturally, the two systems often compete. Kahneman illustrates this with riddles. "A bat and ball cost $1.10 in total. The bat costs $1 more than the ball. How much does the ball cost?" Most of the undergrads surveyed at Harvard and MIT say $.10. The correct answer is $.05, since (i) Bat + Ball = 1.10, (ii) Bat = Ball + 1, and therefore (iii) (Ball + 1) + Ball = 1.10. But many people continue to feel the strong pull of the intuitive yet incorrect answer even after the calculation demonstrates its falsity. Erroneous System 1 thinking is highly seductive; correcting it requires training. And since there's reason to believe that generic cognition is under the control of System 1, we should expect some manifestations of the overgeneralization effect even after the corresponding universal generalization is judged to be false or unacceptable.

As if all this weren't bad enough, the epistemic impact is made worse by a troubling psychological regularity: "Generic statements are often judged true on weak evidence" (Cimpian, Brandone, and Gelman 2010, p. 1477). So, by shifting to a default generic interpretation, we put

ourselves in a position to accept a universal generalization on weak grounds and at the same time shield the resulting belief from falsification by counterexample. To adapt a phrase from al-Ghazālī, the generic overgeneralization effect reveals *immoderation* in belief. Interestingly, the immoderate character of generic thought was anticipated in the mid-sixties. Abelson and Kanouse observed that generic sentences are often accepted on the basis of very little evidence, but "once accepted psychologically they appear to be commonly taken in a rather strong sense, as though the quantifier *always* had implicitly crept into their interpretation" (1966, p. 172; citation in Sterken 2015*a*, p. 80 and Leslie 2017, p. 398).

2. In Defense of the Idea

Support for the generic overgeneralization effect is both experimental and theoretical. The experimental results confirm its reality, but the corresponding theory makes its reality intelligible. Unintelligible experimental results are vulnerable to doubt. But, with Leslie's theory in view, overgeneralization is precisely what we should expect, since the comprehension of a nondefault generalization requires the interpreter to override or inhibit her innately given default pattern of thought.

> For a conceptual system to perform a nondefault generalization, such as a universal one, it must be explicitly commanded to do so. Absent such instruction, the conceptual system simply employs its default. ...Inhibitory processes, by their very nature, are more taxing for the conceptual system to implement than noninhibitory ones. As the demands on the conceptual system are increased, it becomes more likely that it will be overtaxed, and so fail to implement the inhibitory process, and revert to the default (Leslie 2008, pp. 23-27).

The case for Leslie's theory of generics relies on several different strands of argumentation. The one that I emphasized in the previous section began with the observation that generic sentences vary in strength: some appear to be about as strong as a universal; others, almost as weak as an existential. Cases of the latter sort are particularly difficult to handle. They seem to falsify even the most sophisticated and promising semantic theories. Leslie calls them "troublesome" generics, and she distinguishes between two basic types, "A" and "B". In this section, I'll focus entirely on type B generics—those that attribute a potentially dangerous, appalling, or striking property, e.g., *sharks attack bathers*, *mosquitoes carry the West Nile virus*, and *rottweilers maul children*. To streamline the discussion even further, I'll restrict my attention to the example about mosquitoes. Other type B generics raise fundamentally the same issue, and the example about mosquitoes has achieved a kind of celebrity status.

Less than 1 percent of mosquitoes carry the West Nile virus, but *mosquitoes carry the West Nile virus* is intuitively true. Why is that? According to Leslie (2008),

> It should be evident upon reflection that the criteria that govern troublesome generics reflect our psychology. This is especially evident in the B group: the more striking, appalling, or otherwise gripping we find the property predicated in the generic, the more tolerant the

> generic is to exceptions. ...If the above classification of troublesome generics is appropriate, then this suggests that our goal of understanding the quirky behavior of generics might be furthered by looking carefully into some of the relevant psychological literature (pp. 15-16).

Leslie's proposal, as I understand it, is that our default mode of generalization facilitates our intuitive assessment of a generic. If the generic predicates a "striking" property, then that property's infrequent manifestation among members of the relevant kind may not matter. I say it "may" not matter because there's more to the story.

Although *mosquitoes carry the West Nile virus* is true, *animals carry the West Nile virus* is false. Leslie is aware of this:

> ...we do not accept 'animals carry the West Nile virus' or even 'insects carry the West Nile virus', even though both kinds have some members that carry it (namely those few mosquitoes). ...The mechanism [that facilitates our semantic evaluation], I suggest, looks for a *good predictor* of the property in question; it avoids generalizing to overly broad kinds or to irrelevant kinds. In particular, for a kind to be the locus of a striking-property generalization, it seems that the members of the kind that lack the property must at least be disposed to have it (p. 41, Leslie's emphasis).

In light of this complication, Leslie proposes that a type B generic, *Ks are F*, is true if: (i) the exceptions are negative[17] and (ii) if being F is striking, then some Ks are F and the others are disposed to be F (p. 43). This is both a metaphysical proposal about the truthmaker for such generalizations and a psychological theory about the way in which our default mode of generalization functions. One might wonder, what accounts for this happy convergence between mind and world? My hunch is that Leslie would deny that genericity is, as it were, an altogether "worldly" phenomenon. That is, according to her theory, the principles that normally control our most primitive system of generalization *constitute* genericity; they don't merely *track* the phenomenon.[18] Unlike universality, genericity is fundamentally psychological.

The central point for my purpose is that troublesome type B generics appear to create insurmountable problems for every theory of generics except Leslie's. To that extent, they provide support for the theory that generics express a psychologically primitive mode of generalization, because they make the acquisition problem harder to solve. The harder it is for alternative theories to solve the problem, the more plausible Leslie's theory will be. In short, type B generics motivate an understanding of genericity in psychological terms. Remember: "It should be evident upon reflection

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[17] Negative exceptions are individuals that lack the property of being F but don't possess an alternative to Fness. Alternatives are incompatible properties. For example, giving birth to live young is an alternative to laying eggs, but carrying malaria isn't an alternative to carrying the West Nile virus. "There may be reasons to be skeptical of attempts to draw a metaphysical distinction between positive and negative properties. The distinction at hand, however, is not intended as a metaphysical distinction, but rather a psychological one. What matters is whether we take the counterinstances as negative or positive" (Leslie 2008, p. 34).

[18] For alternative opinions, see Cohen (1999), Nickel (2016), Sterken (2015*c*).

that the criteria that govern troublesome generics reflect our psychology. This is especially evident in the B group…" (*op. cit.*).[19]

But this line of thought has been forcefully criticized in recent years (Sterken 2015*a*; 2015*b*; 2017). If the criticism sticks, then one might begin to doubt the generic overgeneralization effect, since its intelligibility rests on Leslie's psychological account of the subject.[20] And, as Sterken is aware, type B generics are "plausibly the best evidence for a psychologically based theory" (2015*b*, p. 2503). So I'd like to quickly present the criticism and explain why it fails. Actually, the upshot will be slightly more interesting: the criticism to which I'll respond inspires a line of thought that ultimately supports the theory it's meant to undermine.[21]

Sterken's criticism relies on conjunctions of the following sort:

4. #Mosquitoes carry the West Nile virus, but typically they don't.[22]

Sentences of this sort sound contradictory. But if the initial conjunct were nearly as weak as an existential, one would expect them to be coherent. Consider Leslie's analysis:

5. Some mosquitoes carry the West Nile virus, and the rest are disposed to, but typically mosquitoes don't carry the West Nile virus.

It sounds fine.

Sterken suggests that (4) sounds contradictory because it is contradictory (2015*a*, p. 83; 2015*b*, pp. 2508-2509; 2017, p. 9). The initial conjunct expresses a generalization that's basically equivalent to the claim that mosquitoes typically carry the West Nile virus. And this generalization is

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[19] One reaction to Leslie's argument is that tokens of type B are ambiguous between a false generic interpretation and a true capacity reading (Asher and Pelletier 2012; Nickel 2016). Insofar as we intuit the truth of *mosquitoes carry the West Nile virus*, we take it to mean that mosquitoes have the capacity to carry the West Nile virus. And if that's right, then our intuitive evaluation of the *mosquito*-sentence doesn't really impinge on the semantics of generics.

Sterken (2015*a*, p. 76-79) persuasively argues against the ambiguity strategy. I won't repeat all of her arguments, but I'll quickly summarize one.

> *i.* #Mosquitoes carry the West Nile virus, but they don't because the virus has been eradicated.
> *ii*. Mosquitoes have the capacity to carry the West Nile virus, but they don't because the virus has been eradicated.

If the *mosquito*-sentence were ambiguous in the relevant sort of way, then (*i*) would have a reading on which it's equivalent to (*ii*). On that reading, (*i*) would be unproblematic. But the only reading of (*i*) that I'm able to detect is problematic.

[20] Saul (2017, p. 4, fn. 2) expresses sympathy for Sterken's criticism.

[21] The discussion that follows is taken from Almotahari (2022).

[22] Sterken also relies on claims about disagreement, but I think these claims raise fundamentally the same issues as (4). Contradictions are, after all, disagreements with oneself.

straightforwardly denied in the second conjunct. Furthermore, since *mosquitoes carry the West Nile virus* is basically equivalent to *mosquitoes typically carry the West Nile virus*, our intuitive assessment of its truth is mistaken. Far too few mosquitoes are carriers of the virus for the typicality generalization to be true. Similar reasoning applies to all type B generics. If the argument succeeds in one case, then plausibly it succeeds in all.[23]

However, if (4) were a genuine contradiction, as Sterken suggests, then we should be unable to eliminate its inconsistency by simply adding more information. In general, one can't achieve coherence by supplementing $p \wedge \sim p$ with q. But the apparent inconsistency of (4) is eliminable in precisely this way:

6. Mosquitoes carry the West Nile virus, but because the overwhelming majority inhabit circumstances that fail to trigger their disposition to do so, they typically don't.

This sentence is perfectly fine.

There are other contexts in which (4) is coherent. Think of a setting in which someone tries to soothe her aerophobic friend's anxiety before an upcoming flight. She does so in a tactful way, acknowledging the validity of her friend's fear but communicating that the risk is negligible. She says,

7. Air travel is a lot safer than it used to be, but you're right: airplanes still crash. Though, typically, they don't.

This sentence seems completely unproblematic. And it's quite easy to adapt the general form of this example to fit (4).

Suppose you're trying to soothe your anopheliphobic friend's anxiety before he heads to a swamp teeming with mosquitoes. You don't want to be a jerk about it, so you make sure to acknowledge the validity of your friend's fear. But you also want to unequivocally assure him that the risk is low. So you say,

8. Mosquitoes aren't as dangerous as we thought, but you're right: they still carry the West Nile virus. Though, typically, they don't.

Again, this seems completely unproblematic.

The felicity of (6)-(8) can't be squared with the hypothesis that all type B generics are "close in meaning" (Sterken's phrase) to a corresponding *typically*-sentence. But there's more. Consider:

9. *a*. Bob might be in his office; in fact, he must be.
   b. #Bob must be in his office; in fact, he might be.

[23] Won't Sterken's argument overgeneralize? That is, won't it imply that even *paradigm* generics (not just tokens of type B) are false? *Birds lay eggs, but typically they don't* sounds contradictory, after all. Sterken is aware of this worry and addresses it (2015*a*, p. 86). She also doesn't rule out the possibility of a more expansive error theory.

The contrast between the felicity of (9*a*) and the infelicity of (9*b*) is evidence that *must* is logically stronger than *might*. One can easily qualify an utterance by saying something stronger; but it's very difficult to qualify an utterance by weakening what one says (Horn 2021; cf., Lewis 1979). Now, for the sake of argument, assume that 90 percent of mosquitoes carry the West Nile virus and consider the following pair of sentences:

10. *a*. Mosquitoes carry the West Nile virus; in fact, they typically do.
    b. #Mosquitoes typically carry the West Nile virus; in fact, they do.

The relationship between genericity and typicality in (10) patterns with *might* and *must* in (9), as Leslie's theory predicts.[24] Sterken's hypothesis (that *mosquitoes carry the West Nile virus* is basically equivalent in meaning to *mosquitoes typically carry the West Nile virus*) implies that (10*a*) and (10*b*) shouldn't significantly differ with respect to acceptability. But they clearly do.

3. An Application of the Idea

Recall the first premise of the *kalām* argument: *everything* that begins to exist has a cause for its existence. The falsity of this premise is compatible with the truth of the corresponding generic:

11. Things that begin to exist have a cause for their existence.

Furthermore, the falsity of (1) is compatible with the necessitation of (11).

12. Necessarily, things that begin to exist have a cause for their existence.

I emphasize these points because Craig defends the first premise of the *kalām* argument by highlighting implausibilities that follow only from a rejection of (11) and (12). For example, Mackie (1982, p. 94) famously questions the first premise of the *kalām* argument. Craig's response to Mackie is telling: "Does Mackie sincerely believe that things can pop into existence uncaused, or out of nothing? Does anyone in his right mind really believe that, say, a raging tiger could suddenly come into existence uncaused, out of nothing, in this room right now?" (2008, p. 113). Similar rhetoric is used in

[24] Strong generics don't exhibit this behavior. Consider:

iii. ??Tigers have stripes; in fact, they typically do.
iv. #Tigers typically have stripes; in fact, they do.

To my ear, (*iii*) is worse than (9*a*), though not quite as bad as (*iv*). Overwhelmingly, my informants corroborate the judgment. It shouldn't be surprising that we don't get the kind of contrast that we observe in (9) and (10). *Tigers have stripes* is about as strong as *tigers typically have stripes*.

Craig and Sinclair (2012, p. 182) and Craig (2018, pp. 15-16).[25] But Mackie's doubts about (1) are compatible with the generic truth that things can't pop into existence uncaused; for the belief that things can't spontaneously pop into existence is merely (12). Nobody who denies (1) is committed to the possibility of uncaused tigers, nor to widespread cases of something coming from nothing. All one would be committed to is a single (and singular) exception to (11), namely, the origin of the universe.[26] And, as we'll see momentarily, there's a compelling reason (internal to the materialist's worldview) to think of it as an exception.

Why might Craig exaggerate the consequences of rejecting premise (1)? For rhetorical effect? –Perhaps. But overblown rhetoric is just as likely to be counterproductive, and a polemicist as skilled as Craig knows that. His rhetoric isn't meant to be hyperbolic; it's meant to be proportional. So then why does he exaggerate? The generic overgeneralization effect provides a plausible explanation: on Craig's implicit interpretation of premise (1), the sentence is assigned a generic reading such that its rejection would be tantamount to a rejection of (11). And a rejection of (11) *would* license the kind of rhetoric that Craig deploys, since it would involve repudiating what we all know to be the case: that there's a large-scale pattern/regularity impeding spontaneous, uncaused generation. This point deserves emphasis. Craig has been thinking and writing about the *kalām* argument for nearly half a century. Probably no one has spent as much time as he has evaluating its merits. If *his* understanding of premise (1) is susceptible to the generic overgeneralization effect, how much more susceptible to it must the neophyte be who reads his work as an introduction to the subject?

Craig isn't unique. Prominent Muslim philosophers have indulged in similar forms of exaggeration while discussing the *kalām* argument's initial premise. For example, al-Kindī acknowledges just two possibilities: either the general premise of the *kalām* argument is true or things pop into existence by chance (Erlwein 2017, p. 43 and fn. 76). If you take this to be a reasonable assessment of the logical landscape, that's only because you've erroneously confused the *kalām* argument's initial premise with (11). And confusions of this sort are to be expected. They're manifestations of the generic overgeneralization effect. In a moment, I'll present another contemporary instance of this effect at work.

Still, one might think that my reasoning is objectionably *ad hominem*. But that would be a mistake. My reasoning provides a charitable interpretation of a demonstrable error in Craig's criticism of Mackie. The rejection of (1) doesn't require the rejection of (11); so Craig is just wrong to impute certain exaggerated consequences to his interlocutor. This raises an interpretive question: why does Craig make this mistake? It's only the attribution of *inexplicable* or *brute* error that's uncharitable (Lewis 1974). By explaining Craig's mistake in terms of the generic overgeneralization effect, I'm

[25] The rhetoric in Pruss and Rasmussen (2018, pp.40-47) is somewhat similar, but in a few key respects the presentation is much more careful.

[26] Oppy (1999) recommends a different sort of restriction. Translating into the idiom of premise (1), the restriction is that everything that begins to exist, *with the exception of the universe*, has a cause for its existence. Koons (2001) criticizes this recommendation on the grounds that it's gruesomely unnatural: Oppy's principle stands to premise (1) as *emeralds are grue* stands to *emeralds are green*. I don't think Koons is right, but in any case there's nothing gruesome about genericity; in fact, one way in which we might maximize the naturalness of our classification scheme is by formulating laws as generics (Nickel 2010).

interpreting him in a way that coheres with the demands of charity. Charitable interpretation is not objectionably *ad hominem*.

Consider this analogy: intuitive assessments of reasoning with universal quantifiers often fail to conform to the principles of logic. For example, Johnston and Leslie report studies in which adult participants judge that argument (A) is stronger than argument (B).

> A. All animals use norepinephrine as a neurotransmitter; therefore, all mammals use norepinephrine as a neurotransmitter.
>
> B. All animals use norepinephrine as a neurotransmitter; therefore, all reptiles use norepinephrine as a neurotransmitter.

These naive evaluations are just plain wrong, according to classical logic. But they make sense on the assumption that participants are interpreting the universal premises as generic claims: "...'animals use norepinephrine as a neurotransmitter' can be true even if some animals are exceptions to the claim. If one judges then that reptiles are more likely than mammals to be exceptions to the generic, then argument (A) is indeed stronger than argument (B). Hence these results are as one would expect if adults have a tendency to evaluate universals as generics" (2012, pp. 126-127). My interpretation of Craig is no more problematic than Johnston and Leslie's interpretation of the subjects who participated in these experiments.

But I think it would be unfair to leave the matter here and simply move on. In the context of addressing doubts about premise (1), Craig raises an important challenge that deserves a response from anyone who, like me, flirts with the idea that the origin of the universe is a harmless exception to (11). He asks, "Why is it only universes that can come into being from nothing? What makes nothingness so discriminating? There cannot be anything about nothingness that favors universes, for nothingness does not have any properties. Nor can anything constrain nothingness, for there is not anything to be constrained" (Craig and Sinclair 2012, p. 182). Craig reiterates this challenge in his more recent defense of the *kalām* argument (Craig 2018). Something ought to be said here, and the answer had better not rely on the nature of nothingness.

But it might plausibly rely on a feature of universes: perhaps it's essential to causation that a universe—a maximally specific distribution of matter over space and time—is a condition for its very possibility. More concisely: no universe, no spatiotemporal manifold; no spatiotemporal manifold, no causation. That seems like a thought perfectly suited to a materialist worldview, the sort of worldview that friends of the *kalām* argument typically want to undermine. In fact, Kim (2003) presents an ingenious argument for roughly this conception of causation. As one might expect, the argument has met with some resistance (see, for example, Bailey, Rasmussen, and Van Horn 2011), but my claim here isn't that one is rationally obliged to accept Kim's conception of causation; my claim is far more modest: if causation requires a system of space, time, and matter for its very possibility—a thesis for which Kim's argument provides independent (if inconclusive) motivation—then there's hardly anything arbitrary or *ad hoc* about that very requirement being an exception to the demand for causal explanation. A somewhat pleasant feature of this response, from a dialectical point of view, is that it

relies on nothing more than the familiar strategy that the cosmological arguer relies on to avoid an infinite regress of causes: the nature of The First Cause precludes It from requiring a causal explanation because It cannot *not* exist. Both the cosmological arguer and I suggest that, because something has a nature of a certain sort, the demand for a specific sort of causal account doesn't arise. But I'm not saying that *no* explanation can be given for the existence of the universe. Perhaps the explanation is probabilistic,[27] or perhaps it takes some form still awaiting discovery. I don't know. Does anyone?

I suspect that Craig and Sinclair's challenge—"Why is it only universes that can come into being from nothing?"—is really an assertion disguised as a question. It seems that what they're really saying is that a rejection of the *kalām* argument's first premise would involve a commitment to something far too arbitrary to be credible: that everything except for the biggest thing there is requires a cause for its existence.[28] In the previous paragraph, I suggested that there's a better way to think about the position. But if Craig and Sinclair's point is about the arbitrariness of rejecting premise (1), then their case is fundamentally no different from the sort of rationale one finds for the induction step of a *sorites* argument. This is noteworthy because the induction step appears to exploit the generic overgeneralization effect.

> People deduce that there must be an exception to the induction step of the sorites:
>
> > Base step. One is a small number.
> > Induction step. Small numbers have small successors.
> > Conclusion. A billion is a small number.
>
> Yet they are reluctant to concede that the notional exception constitutes refutation of the induction step. They confidently apply the generalization to any number you pick.
>
> Recent work on the 'Generic Overgeneralization Effect' suggests a psychological explanation of this loyalty to the induction step. Although the propounder of the sorites paradox intends the induction step to be a universal generalization, hearers assimilate universal generalizations to generic generalizations (for instance, 'All birds fly' tends to be remembered as 'Birds fly'). Most generic generalizations permit exceptions—especially when those exceptions are rare, abnormal or difficult to imagine. Any counter-example to the induction step will have all of these features. After all, sorites arguments are crafted to ensure a smooth ride down the slippery slope (Sorensen 2012, p. 444).

The ride is made smooth by the thought that any stopping point would be implausibly arbitrary or *ad hoc*. But this form of argument trades on our vulnerability to overgeneralize. Any exception to (11) will also be rare, abnormal, and difficult to imagine. Our expectations about how things originate have been conditioned by both evolution and a lifetime of personal experience with "medium-sized" objects.

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[27] See van Inwagen (1996) for an argument to this effect. The argument has inspired many responses.
[28] Cf., Pruss and Rasmussen (2018, pp. 40-47).

So it appears no less likely, given our psychological propensities, that we're apt to assimilate premise (1) to principle (11).

If the appeal of premise (1) is, at least partially, due to the overgeneralization effect, then we should expect people who deny it to continue to feel its pull even after they acknowledge its probable falsity. And this expectation is easily confirmed. Despite his doubts concerning the first premise of the *kalām* argument, Mackie confesses that he can't help but find it attractive: "Still, this [causal] principle has some plausibility, in that it is constantly confirmed in our experience (and also used, reasonably, in interpreting our experience)" (1982, p. 89). Mackie's ambivalence is intelligible: unearned credibility is assigned to a false or objectionable universal generalization because it's automatically interpreted as a true or plausible generic.

The cosmological arguer might respond to all of this with puzzlement: "Okay, but so what? I mean, can't I easily skirt your objection by simply reformulating premise (1)? What if I say instead that *nothing* that begins to exist does *not* have a cause for its existence? This claim is logically equivalent to (1) but not universal in form. So there's no danger of erroneously treating a generic as if it were a universal."[29]

But this response is based on a misunderstanding of the triggering conditions for overgeneralization. The presence of a universal quantifier isn't necessary. If interpreting or evaluating a generalization (whether universal or not) is a sufficiently demanding task, then one's conceptual system is likely to fail at implementing the inhibitory process that suppresses the default generic interpretation. After all, inhibitory processes are more taxing than default ones (compare how easy it is to conform to a habit with how hard it is to eliminate one). "As the demands on the conceptual system are increased, it becomes more likely that it will be overtaxed, and so fail to implement the inhibitory process, and revert to the default" (Leslie 2008, p. 27). Sufficient cognitive strain results in a failure to curb the default reading and thus triggers overgeneralization. Now, the claim that nothing that begins to exist does not have a cause for its existence is manifestly more difficult to parse than the generalization that (1) expresses. (The interpretation of *every F is G* is less demanding than *it's not the case that some F is not G*. Presumably, that's why the *kalām* argument is canonically formulated in terms of a universal quantifier.) So the claim with which the cosmological arguer proposes to replace (1) isn't less likely to exploit our susceptibility to generic overgeneralization; it's actually more likely to do so.

At this stage one might reasonably wonder whether the conclusion of the *kalām* argument receives enough support from (11) and (2) to be rationally compelling.[30] After all, isn't the inference from *ravens are black*, and *Rupert is a raven*, to *Rupert is black* a reasonable one to draw, even though it's less than fully conclusive? This line of thought rests on a faulty analogy. An apt analogy with (11)

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[29] Thanks to Brian Rabern and Patrick Todd for raising this worry in conversation.

[30] Cf., Koons (1997), in which the general premise of the argument is a restricted generalization: "normally, a wholly contingent fact has a cause" (p. 197). And this restricted generalization is understood as a "default or defeasible rule" of inference: "...in the absence of evidence to the contrary, we may infer, about any particular wholly contingent fact, that it has a cause" (p. 196). Given the characteristic psychological role of generics as default inference licensors (Khemlani et al. 2012), the general premise Koons relies on is functionally equivalent to 1G. To this extent, his formulation of the cosmological argument is superior but less conclusive.

would rely on a generic sentence that specifies a temporally sensitive relation between ravens, just as (11) specifies a temporally sensitive relation between things that begin to exist and their causes. So the analogue generalization would be something like this: *ravens are the immediate offspring of ravens*. And the analogue of (2) would, presumably, be the claim that membership in the kind *raven* began with an original specimen—call her Rowen. Given these claims, how rationally compelling is the conclusion that Rowen is the immediate offspring of ravens? I submit that it's not at all compelling, because it's incompatible with our assumption that Rowen is the original raven. With this assumption held fixed, the proper conclusion to draw is that Rowan is a harmless exception to the generic truth that ravens are the immediate offspring of ravens. For many of us, the *kalām* argument's initial premise suffers from a parallel issue: the erroneous demand to give a causal account of the condition for the possibility of causation.

The cosmological arguer is unlikely to concede. She might defend the initial premise of the *kalām* argument (or something in the vicinity) on *a priori* grounds. Here's my best attempt on her behalf.

Lions are birthed; sea-turtles hatch; and stars are formed when massive clouds of gas coalesce. But what about the members of a much more general kind? How do *contingent beings* characteristically originate? One answer immediately suggests itself: contingent beings originate by means of causation. But if we think of a cause for the existence of something as that on which its being is contingent, then our answer seems to be a conceptual truth: contingent beings originate by means of that on which their being is contingent. How could something be a contingent being without being contingent *on* something? Isn't that like being a mother without being the mother *of* anyone? And isn't that inconceivable? Surely *every* mother is someone's mother. Likewise, because our reasoning depends on nothing more than the nature of contingency *per se*, one might think it obvious that *every* contingent being is contingent on something. On what, exactly? –On that by means of which it originates. Equivalently, every contingent being originates by means of causation. We then obtain premise (1) by restricting the domain of this conclusion to a subset of *temporal* contingents, specifically, those that have a beginning.

This line of thought appears to vindicate al-Ghazālī's view that premise (1) is an *a priori* truth. But, as compelling as it may be, one can plausibly challenge the assumption that the relationship between being contingent and being contingent on something is aptly modeled by the relationship between being a mother and being the mother of someone. A genuinely random state of affairs (such as the result of radioactive decay) is, presumably, contingent but uncaused; therefore, it's not in the relevant sense contingent *on* anything. Perhaps there are no genuinely random states of affairs. It doesn't really matter. What matters is that there might have been. Random occurrences aren't ruled out by the nature of contingency. If contingency is a kind of modal instability, then random occurrences are among the most contingent of all contingencies. So a better model of the relationship between being contingent and being contingent on something is given by the relationship between being precious and being precious to someone. Being precious doesn't require being precious to anyone.

I don't know of a promising *a priori* argument for (1). Insofar as it compels assent, it does so because it seems to be incompatible with our experience of causal order. That, at any rate, is what the

cosmological arguer often emphasizes—the absence of things "popping into existence" (Pruss 2009, p. 125). But this observation is compatible with the denial of (1). Why might one think otherwise? At this stage, the answer hardly needs repeating.

My central claim has been that the plausibility of (1) issues from a persistent cognitive defect. This suggestion obviously bears on a larger issue that I won't pursue here, but that I hope receives attention from others. The first premise of the *kalām* argument unmistakably resembles the Principle of Sufficient Reason (PSR), namely, that *all* truths (facts, states of affairs, etc.) have an explanation. It is, apparently, a restricted version of the PSR—one that concerns existential facts of a certain sort and their causal explanation. Interestingly, the PSR seems to be enjoying a revival (Amijee 2021; Della Rocca 2010; Pruss 2006). Could its plausibility issue from the same overgeneralization effect? Shouldn't this not-so-far-fetched possibility by itself make us more skeptical of the PSR's enduring pull? I'll leave these questions hanging, but it's worth considering one influential author's remarks on the matter.

According to Pruss, "Many of those who accept the PSR do so unreflectively because they take the PSR to be self-evident. I do not think there is any good argument against the propriety of doing so" (2012, pp. 26-27). Unreflective acceptance is a hallmark of System 1 cognition and generic overgeneralization. That should give us pause. Pruss continues: "If the PSR were false, we would expect a profusion of events that would not appear to fit into any kind of nomic causal order" (p. 32). This statement resembles the exaggerated rhetoric we observed in Craig's defense of the *kalām* argument, and it's no more reasonable. Those of us who happen to be suspicious of the PSR would agree that, generically, truths are explicable (GPSR), and perhaps even necessarily so. But what follows from this? As before, I don't think Pruss is deliberately exaggerating. He's far too careful a philosopher. His rhetoric is intelligible on the assumption that he's assigning the PSR an interpretation that's equivalent to the GPSR. And rejection of the GPSR would have the consequences he describes.

Pruss defends unreflective acceptance of the PSR by analogy: "We are perfectly within our epistemic rights to accept the Law of Excluded Middle (LEM), namely the claim that for all p we have p or not-p, because of the self-evidence of LEM, without needing any further argument for it" (p. 27). But there seems to be an important difference between cosmological principles like the PSR and logical truths like the LEM. Logical truths hold by dint of their form. As Quine memorably put the point, "Logic chases truth up the tree of grammar" (1986, p. 35). And the logically relevant form of a representation is traditionally understood to be transparent to *res cogitans*. What this transparency amounts to is notoriously unclear, but one might plausibly interpret the notion so that the traditional understanding of logical form underwrites a presumptive entitlement to the LEM. I know of no good reason to think that cosmological truths (in particular, the PSR) should be similarly transparent to the mind.

I believe the proposition that there's a First Cause is an empirical hypothesis whose truth ought to be evaluated by a global assessment of theoretical costs and benefits. What I've argued should be understood in the light of this general method. The price of denying the principle of universal causality (that everything that begins to exist has a cause for its existence) is nowhere near as costly as it initially appears. If it seems incompatible with the observable causal order of the world, that's only because it's

been confused with (11). This sort of confusion is prevalent and explicable: it results from generic overgeneralization.

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