Freedom, Foreknowledge, and Dependence: A Dialectical Intervention

Taylor W. Cyr and Andrew Law

Forthcoming in American Philosophical Quarterly; please cite published version.

Abstract

Recently, several authors have utilized the notion of dependence to respond to the traditional argument for the incompatibility of freedom and divine foreknowledge. However, proponents of this response have not always been so clear in specifying where the incompatibility argument goes wrong, which has led to some unfounded objections to the response. We remedy this dialectical confusion by clarifying both the dependence response itself and its interaction with the standard incompatibility argument. Once these clarifications are made, it becomes clear both (1.) that the dependence response does not beg the question against the proponent of the incompatibility argument and (2.) that the dependence response advances the dialectic whether it is developed as a version of Ockhamism or as a version of multiple-pasts compatibilism.

1. An Argument and a Response

Suppose that, 1,000 years ago, God knew, and hence believed, that Jones would read this paper today. If God had such a belief, could Jones have done otherwise than read this paper today? If she could have, then either she could have made God's past belief false or she could have made God have a different past belief. But no one can do either of those things. So, if God knew 1,000 years ago that Jones would read this paper today, then Jones couldn't have done otherwise. And the argument generalizes. So, God's foreknowledge is incompatible with the freedom to do otherwise. Call this the incompatibility argument.¹

There are many responses to this old and venerable argument (or something like it). One recently popular response appeals to *dependence*: God's past belief that Jones will read this paper today *depends* on Jones's reading this paper today, not the other way around. Once we see this, so the response goes, it is easy to see that the incompatibility argument is unsound.

But where, exactly, does the incompatibility argument go wrong according to the dependence response? Proponents of the dependence response have not always been so clear in answering this question, and this has led to some unfounded objections to the dependence response. Given this lack of clarity, an intervention is needed. We aim to give such an intervention.

In what follows, we will lay out how we see the dialectic and what the proponent of the dependence response ought to say about the incompatibility argument. We then show how framing the dialectic in the way we suggest sheds light on several recent comments and objections. Ultimately, we will not be taking a stand on whether the dependence response succeeds, but we do think that the dependence response is distinct from and superior to previous responses to the incompatibility argument. In particular, while we admit that the dependence response must be either a version of Ockhamism or a version of multiple-pasts compatibilism, we will argue that the dependence response advances the dialectic either way, regardless of which camp it falls into. To show this, we will consider a dependence response that counts as a version of Ockhamism and a dependence response that counts as a version of multiple-pasts compatibilism, and we will argue that each is distinct from and superior to traditional versions of each view.

2. The Dialectic

The proponent of the dependence response should not think that the incompatibility argument is question-begging (Merricks 2009; 2011), nor should she think the argument is invalid (Westphal 2011; 2012).² Rather, the proponent ought to maintain that the argument has a false premise (or at least an unmotivated premise); in particular, she ought to claim that it is false that no one can make God have a different past belief (or at least that we've not been given any reason to think that this premise is true).³ More precisely, she should claim that *if* an agent is free to perform *X absent* divine foreknowledge, then the agent is free to perform *X given* divine foreknowledge as well. That is, she should claim that the mere addition of divine foreknowledge is not sufficient to rule out freedom. As such, if Jones could have refrained from reading this paper *absent* divine foreknowledge, then she could have refrained from reading this paper *given* divine foreknowledge as well and, thus, could have made God have a different past belief.

Utilizing the analysis of "can" first proposed by Angelika Kratzer (1977) will make the dependence response and the dialectic even clearer. Under Kratzer's semantics, claims of the form "Agent S can perform action X" ought to be understood as modal claims of (roughly) the form "In view of the relevant facts, it is possible for S to perform X." Typically, context will determine which facts are "relevant," but in the context of the freedom to do otherwise, proponents of the dependence response should insist that facts that are dependent on S's performing X are not relevant – that such facts should not be held "fixed."

The dependence response now becomes crystal clear. If Jones could have done otherwise than read this paper today *absent* God's past belief that she would read this paper today, then the *mere addition* of God's past belief cannot undermine Jones's freedom. For, according to the dependence response, God's past belief is dependent on Jones's reading this paper today and, hence, shouldn't be held fixed in assessing whether she can refrain from reading this paper. And assuming that Jones could have done otherwise absent God's past belief, it follows that she could have made God have a different past belief.

This also sheds light on what it means to say that Jones could have made God have a different past belief. Call God's past belief that Jones would read this paper today fact F. The claim that she could have made God have a different past belief is *not* tantamount to the claim that it is possible for her to have performed some action such that, prior to her performing the action, F obtained, but, after her performing the action, F does not obtain. Surely, it is *not* possible for Jones to perform any such action, as any world where she performs such an action is contradictory. Rather, the claim that Jones could have made God have a different past belief is tantamount to the much less pernicious claim that it is possible for Jones to have performed some action such that, if she performed it, F never would have obtained in the first place.

In short, the heart of the dependence response should be understood as making the following two claims: (i) any fact that is dependent, in the right way, on S's performing X shouldn't be held fixed when assessing whether S can do otherwise than X;⁴ and (ii) that God's past belief that S will perform X is dependent, in the right way, on S's performing X. Given (i) and (ii), it is false that Jones can't make God have different past beliefs (provided that she was free absent God's beliefs), and thus the incompatibility argument has a false premise. As such, the best way for the dialectic to proceed is to focus on claims (i) and (ii). For if both of these claims are correct, then the dependence response is victorious. But if either claim is incorrect, then the dependence response fails.

3. The Charge of Dialectical Impropriety

In addition to clarifying a dialectic that, because of its complexity, is easy to misconstrue, we think that our representation of the dependence response shows how two recent objections to the dependence response miss their mark. The first objection charges the dependence response with begging the question against the incompatibilist. The second objection charges the dependence response with failing to advance the dialectic in any helpful way (since it is not a new position but rather either a version of Ockhamism or of multiple-pasts compatibilism). We will address the first objection in this section and the second objection in the next.

John Martin Fischer and Neal Tognazzini (2014) have argued that several recent presentations of the dependence response – defended by Storrs McCall (2011), Trenton Merricks (2009; 2011), and Jonathan Westphal (2011) – "fail to respect the relevant dialectical context by presupposing the very thing that is called into question by the incompatibility argument." (2014, p. 362) In particular, Fischer and Tognazzini claim that these authors' responses to the incompatibility argument rely on the claim that we (ordinary human agents) have a choice about

what we do (and thus what God believed we would do), which is to say that we have the freedom to do otherwise than what God believed we would do. But this claim, Fischer and Tognazzini argue, is dialectically unavailable to the proponents of the dependence response, for it is precisely this claim that is called into question by the incompatibility argument. Thus, Fischer and Tognazzini conclude, the dependence response simply begs the question.

Given our understanding of the dialectic, however, the dependence response does not beg the question against the incompatibilist. As we see the dialectic, the incompatibilist begins by presenting an argument that aims to call into question the intuitive idea that we possess the freedom to do otherwise (if God has exhaustive foreknowledge of what we do), and the argument aims to do this by appealing to God's past beliefs. According to the dependence response, however, the mere addition of God's past beliefs into the picture does not (on its own) call into question our freedom to do otherwise, for (some of) God's past beliefs depend on what we now do and thus should not be held fixed when assessing whether we can now do otherwise. Crucially, the proponent of the dependence response is *not* simply insisting that we do have the freedom to do otherwise (regardless of whether God has exhaustive foreknowledge). Rather, the proponent of this response is claiming that if we could have done otherwise absent God's past beliefs, then the mere addition of God's past beliefs cannot undermine our freedom to do otherwise. (Again, according to the dependence response, God's past beliefs, since they depend on what we do, shouldn't be held fixed in assessing whether we can do otherwise.) *Contra* Fischer and Tognazzini, nothing about this response requires a commitment to the claim that we do in fact have a choice about what we do (or that we do in fact have the freedom to do otherwise). So, once the dialectic has been clarified, it is clear that the dependence response does not beg the question against the incompatibilist.

4. The Charge of Failing to Advance the Dialectic

We have seen that the dependence response is not guilty of dialectical impropriety, but does it help to advance the dialectic? One might think that if the dependence response is really only a version of Ockhamism, or of multiple-pasts compatibilism, then the dependence response has failed to advance the dialectic in any helpful way, since it would collapse into one of these standard and well-worn responses to the incompatibility argument. For example, Fischer and Tognazzini (2014, pp. 363-365) argue that charitably reconstructed versions of dependence responses must fall into one of these two camps (Ockhamism or multiple-pasts compatibilism) and thus that there is nothing new in the dependence response. In a similar vein, Patrick Todd and Fischer (2013, pp. 294-296) argue that a necessary step in the Ockhamist project "crucially involves the notion of dependence" (2013, pp. 295), which may also be taken to suggest that there is nothing new in the dependence response. Now, we agree that the dependence response must fall into one of these two camps (though we think the multiple-pasts compatibilist camp is a more natural fit), but we think that the dependence response advances the dialectic either way, regardless of which camp it falls into. To show this, we will consider a dependence response that counts as a version of Ockhamism and a dependence response that counts as a version of multiple-pasts compatibilism, and we will argue that each is distinct from and superior to traditional versions of each view.

In their response to the incompatibility argument, Ockhamists begin by distinguishing between hard (temporally intrinsic) and soft (temporally extrinsic/relational) facts about the past. The fact that JFK was assassinated is a hard fact about the past, but the fact that JFK was assassinated 55 years before we wrote this paper is a soft fact about the past. Intuitively, although hard facts are "over and done with" and must be held fixed when assessing what we can now do,

the same does not apply to soft facts. The Ockhamist then maintains that God's past beliefs are soft facts about the past and thus should not be held fixed when assessing what we can now do. What accounts for the difference between hard and soft facts about the past? Well, it is open to the proponent of the dependence response to propose that soft facts about the past are those that depend on what occurs at later times, whereas hard facts about the past do not depend on what occurs later on.⁵ And, the dependence response would continue, facts that depend on what we do at a certain time should not be held fixed when assessing what we can do at that time. This response would count as a version of Ockhamism.

Although a version of Ockhamism, however, this dependence response would be distinct from and superior to traditional versions of Ockhamism. The traditional way to distinguish between hard and soft facts about the past is by appealing to an "entailment criterion of soft facthood," according to which soft facts about the past are those that *entail* some (contingent) fact about the future. But a major problem for the entailment criterion is that the notion of entailment is too weak to do the job. Borrowing a case from Patrick Todd (2013), God's past *decrees* concerning what will happen in the future would entail facts about what will happen, but clearly God's past decrees are not soft facts about the past. This problem is obviated by the dependence version of Ockhamism, however, since God's past decrees would not depend on what happens later (on the contrary, what happens would depend on God's decrees). So not only is the dependence version of Ockhamism distinct from the traditional version, but it is also superior to it.

Multiple-pasts compatibilists respond to the incompatibility argument by denying that hard facts about the past must always be held fixed when assessing what we can now do. On this view, it is sometimes the case that we have the freedom to do things that would require the hard (intrinsic)

past to be different than how it actually is. Why think that some hard facts about the past need not be held fixed? Well, it is open to the proponent of the dependence response to propose both (1.) that it is possible for the hard (intrinsic) past to depend on what we do now and (2.) that God's past beliefs are part of the hard (intrinsic) past.⁷ And, the dependence response would continue, since facts that depend on what we do at a certain time should not be held fixed when assessing what we can do at that time, we should not hold fixed God's past beliefs in evaluating what we can now do. This response would count as a version of multiple-pasts compatibilism.

Although a version of multiple-pasts compatibilism, however, this dependence response would be distinct from and superior to traditional versions of multiple-pasts compatibilism. The traditional way to argue that the hard past need not always be held fixed is by appeal to examples (with a very specific structure) in which an agent (apparently) can do something that, in the circumstances, would not be possible without a change in the hard past.⁸ Consider John Martin Fischer's example of the salty old seadog:

Each morning at 9:00 a.m. (for the past forty years) he [the salty old seadog] has called the weather service to ascertain the weather at noon. If the "weatherman" says at 9:00 that the weather will be fair at noon, the seadog goes sailing at noon. And if the weatherman says that the weather won't be fair at noon, the seadog *never* goes sailing at noon. The seadog has certain extremely regular patterns of behavior and stable psychological dispositions – he is careful to find out the weather forecast, is not forgetful, confused, or psychologically erratic, and whereas he loves to go sailing in sunshine, he detests sailing in bad weather. (1994, pp. 80-81)

Now suppose that the seadog was told at 9:00 this morning that the weather at noon would be horrible, and so he does not in fact go sailing at noon. Nevertheless, we might ask, could the seadog

have gone sailing at noon? According to the multiple-pasts compatibilist, the answer is "yes," despite the fact that the following "backtracker" (a conditional whose consequent concerns the hard past) is true: if the seadog had gone sailing at noon, he would have received a different forecast at 9:00. As Fischer (1994, pp. 81-85) argues, though, it is controversial whether the agent really is able to do the thing in question in these examples (or whether the relevant "backtracker" is really true in the examples), and so the use of these examples leads to a dialectical stalemate. This problem is obviated by the dependence version of multiple-pasts compatibilism, however, since it relies on intuitive claims about the order of dependence rather than on controversial claims about these examples.⁹

There is a deeper worry for the salty old seadog case as well. Even if the case is successful, it only provides motivation for multiple-pasts compatibilism if we conceive of the fixity of the past in a certain way. In particular, we must conceive of the fixity of the past as follows (called "FP-CF" for "Fixity of the Past-Counterfactual"):

FP-CF: An agent S can do otherwise than X at t only if, had S done otherwise than X at t, the intrinsic (or hard) past relative to t would not have been different.

But, as John Martin Fischer (2011) notes, this is not the only conception of the fixity of the past.

Consider the following conception (called "FP-PW" for "Fixity of the Past-Possible World"):

FP-PW: An agent S can do X at t only if there is a possible world with the same intrinsic (or hard) past up to t in which S does X at t.

While the salty old sea dog case may impugn FP-CF, it does not impugn FP-PW. Even if the *closest* possible world where the salty old sea dog goes sailing at noon is a world with a different intrinsic past, it does not follow that *every* world where the salty old sea dog goes sailing at noon

is a world with a different intrinsic past. But that latter claim is exactly what we need if the salty old seadog case is to be a counterexample to FP-PW.

Now here's the crucial point: the incompatibility argument looks just as plausible using FP-PW instead of FP-CF. It does seem that *every* world where Jones refrains from reading this paper is a world where God has a different past belief. Hence, if the incompatibility is formulated with an appeal to FP-PW instead of FP-CF, the salty old sea dog case fails to undermine the argument. In contrast, by claiming that no dependent fact, intrinsic or otherwise, ought to be held fixed in assessing what an agent can do at the relevant time, the dependence response, if successful, would undermine FP-PW as well as FP-CF. So, the dependence response goes beyond traditional multiple-pasts compatibilists who only appeal to examples like the salty old seadog.

Perhaps the traditional multiple-pasts compatibilist can offer an alternative case that does seem to be a counterexample to FP-PW, though. Consider Alvin Plantinga's case of Paul and the ant colony:

Let's suppose that a colony of carpenter ants moved into Paul's yard last Saturday. Since this colony hasn't yet had a chance to get properly established, its new home is still a bit fragile. In particular, if the ants were to remain and Paul were to mow his lawn this afternoon, the colony would be destroyed. Although nothing remarkable about these ants is visible to the naked eye, God, for reasons of his own, intends that it be preserved. Now as a matter of fact, Paul will not mow his lawn this afternoon. God, who is essentially omniscient, knew in advance, of course, that Paul will not mow his lawn this afternoon; but if he had foreknown instead that Paul would mow this afternoon, then he would have prevented the ants from moving in. (1986, p. 254)

Plantinga claims that, intuitively, Paul can mow his lawn this afternoon despite the fact that his doing so would require the truth of a certain backtracker. But not only does this case require the truth of a certain backtracker. If we think of God's past intentions as temporally intrinsic (or hard) facts, this also seems to be a case where Paul can perform an action despite the fact that there is *no* world with the same intrinsic past where he performs that action. Hence, this seems to be a counterexample to FP-PW. Thus, perhaps traditional multiple-pasts compatibilists can motivate a rejection of FP-PW just as well as the dependence response theorist can.

Even if Plantinga's case successfully motivates a rejection of FP-PW, though, there are two respects in which the dependence response has the advantage over traditional multiple-pasts compatibilism. First, the dependence response can *explain* why we might think that Paul is free to mow his lawn. The fact that the ant colony is in his yard depends on certain of God's past mental states, which depend on Paul's decision to not mow his lawn this afternoon. Hence, according to the dependence response, we should hold neither the presence of the ant colony nor God's relevant past mental states fixed in assessing whether Paul can mow his lawn. Py offering an explanation, the dependence response advances the dialectic beyond traditional multiple-pasts compatibilists who merely appeal to intuition about such cases.

The second point to note is that the dependence response can treat the salty old seadog case differently than Plantinga's case. Given that the weather forecast does not depend on what the salty old seadog does at noon, it is open for the dependence response to claim that we ought to hold the weather forecast fixed in assessing what the salty old seadog can do at noon. But given that the presence of the ant colony is dependent on Paul's refraining from mowing his lawn, the dependence response insists that we should not hold the presence of the ant colony fixed. Treating

these two cases differently is a novel implication of the dependence response, as these two cases (or similar ones) are often lumped together by traditional versions of multiple-pasts compatibilism.

For these reasons, we conclude, the dependence version of multiple-pasts compatibilism is distinct from and superior to traditional versions of the view.

We have argued that the dependence response can advance the dialectic regardless of whether the it falls into the Ockhamist camp or into the multiple-pasts compatibilist camp. We have also argued that, once the dialectic is clarified, it is clear that the dependence response is not guilty of the dialectical impropriety with which it has been charged. It is consistent with what we have said, of course, that the dependence response fails for some other reason, but we hope to have shown that it should not be ruled out for dialectical reasons.

University of California, Riverside
University of California, Riverside

NOTES

Thank you to Jonah Nagashima and Philip Swenson for comments on previous drafts.

- 1. See Pike (1965) for the classic presentation of this argument.
- 2. To be fair to Merricks and Westphal, the arguments that they take to be question-begging and invalid, respectively, are distinct from the incompatibility argument as we have presented it. But, we think, the fact that Merricks and Westphal have presented and discussed similar but distinct (and clearly inferior) arguments has added to the confusion surrounding this dialectic, and their own versions of the dependence response would have been clearer had they presented the dialectic as we will here.
- 3. If one is an impossibilist for independent reasons (because one thinks the concept of freedom is inherently contradictory, say), then even though one will think that it's true that no one can make God have a different past belief, this has nothing to do with divine foreknowledge or the past *per se*, and so one will take this premise of the incompatibility argument to be unmotivated.
- 4. See Swenson (2016, p. 662) for a similar thought, though Swenson's "No Independence Account" concerns what an agent has an *opportunity* to do, not what an agent *can* do. (In contrast, Swenson's "Fixity of the Independent Past" *is* about what an agent *can* do but does not imply that if a fact is explanatorily dependent then it should not be held fixed.) Also, see Fischer and Todd's introduction to their edited volume *Freedom, Fatalism, and Foreknowledge* (2015).
- 5. This is one of the interpretations Fischer and Tognazzini give to the dependence response:

One way to understand Ockhamism is as the general view that, once we figure out how best to distinguish between JFK's assassination and the fact that JFK was assassinated 49 years before we wrote this paper, we'll be able to block the incompatibility argument by pointing out that God's past beliefs are more like the latter than they are like the former. One way to draw the distinction is in terms of *temporal intrinsicality*, but perhaps another is in terms of *dependence*. On this way of articulating the Ockhamist project, Merricks, McCall, and Westphal (on our charitable revision of their arguments) are just articulating a version of Ockhamism. (2014, p. 364)

For a development of this suggestion on behalf of Ockhamists, see Todd (2013).

- 6. This is an oversimplification, but it will suffice for our purposes. See the papers in Fischer (1989) for various versions of this criterion, and see Todd (2013) for critical discussion.
- 7. This is another interpretation Fischer and Tognazzini give to the dependence response: On second thought, someone might think that there is indeed something new here. That is, someone might think that what is new is the contention that when a hard fact about the past depends in a certain way on an agent's present behavior, then the past fact even a hard fact is not fixed. This would then suggest a kind of "defense" of multiple-pasts compatibilism (although only in the context of debates about God's foreknowledge, not causal determinism). (2014, p. 365)

Fischer and Tognazzini go on to argue that this view does not address the principle of the fixity of the past—though see Swenson (2016) for (what is plausibly interpreted as) a development of this suggestion, one that denies that the "hard" past should always be held fixed but that uses explanatory dependence to reformulate the principle of the fixity of the past (into a principle of the fixity of the *independent* past). Even if Fischer and Tognazzini are right about this, however, it does not follow that the view fails to advance the dialectic.

- 8. For the classic examples, see Saunders (1968), and see Fischer (1994, chapter 4; 2016, chapter 5) for discussion.
- 9. One might worry that the dependence version gives rise to a new problem and thus is not superior to the traditional version since it presupposes that it is possible for the hard past to depend on what occurs later on, and this is controversial. But even if this is right, discussion of this worry would take the dialectic in a new direction, allowing for dialectical progress, and would not, like the traditional version of multiple-pasts compatibilism, lead to a dialectical stalemate.
- 10. To be clear, Plantinga does not think of God's past intentions or beliefs as temporally intrinsic or hard facts.
- 11. In places, it seems as if Plantinga tries to offer an explanation. However, his explanation seems to be in terms of entailment which, as we argued above, is problematic.
- 12. We are assuming that the dependence relation is transitive or that, at the very least, the ant colony's presence in the yard is dependent on Paul's not mowing the yard.
- 13. See Fischer and Todd (2013) for further discussion about this case and its relation to various versions of the principle of the fixity of the past.

References

Fischer, John Martin, ed. 1989. *God, Foreknowledge, and Freedom* (Stanford: Stanford University Press).

- -----. 1994. *The Metaphysics of Free Will: An Essay on Control* (Oxford: Blackwell).
- -----. 2011. "Freedom, Foreknowledge, and the Fixity of the Past," *Philosophia*, vol. 39, no. 3, pp. 461-474.
- -----. 2016. Our Fate: Essays on God and Free Will (New York: Oxford University Press).
- Fischer, John Martin, and Tognazzini, Neal. 2013. "The Logic of Theological Incompatibilism: A Reply to Westphal," *Analysis*, vol. 73, no. 1, pp. 46-48.
- Fischer, John Martin, and Tognazzini, Neal. 2014. "Omniscience, Freedom, and Dependence," *Philosophy and Phenomenological Research*, vol. LXXXVIII, no. 2, pp. 346-367.
- Fischer, John Martin and Todd, Patrick. 2015. Introduction to *Freedom, Fatalism, and Foreknowledge*, ed. John Martin Fischer and Patrick Todd (New York: Oxford University Press), pp. 1-38.
- Kratzer, Angelika. 1977. "What 'Must' and 'Can' Must and Can Mean," *Linguistics and Philosophy*, vol. 1, no. 3, pp. 337-355.
- McCall, Storrs. 2011. "The Supervenience of Truth: Freewill and Omniscience," *Analysis*, vol. 71, no. 3, pp. 501–506.
- Merricks, Trenton. 2009. "Truth and Freedom," *The Philosophical Review*, vol. 118, no. 1, pp. 29–57.
- -----. 2011. "Foreknowledge and Freedom," *The Philosophical Review*, vol. 120, no. 4, pp. 567–586.
- Pike, Nelson. 1965. "Divine Omniscience and Voluntary Action," *The Philosophical Review*, vol. 74, no. 1, pp. 209–216.
- Plantinga, Alvin. 1986. "On Ockham's Way Out," Faith and Philosophy, vol. 3, no. 3, pp. 235-269.
- Saunders, John Turk. 1968. "The Temptations of 'Powerlessness'," *American Philosophical Quarterly*, vol. 5, no. 2, pp. 100-108.
- Swenson, Philip. 2016. "Ability, Foreknowledge, and Explanatory Dependence," *Australasian Journal of Philosophy*, vol. 94, no. 4, pp. 658-671.
- -----. 2017. "Fischer on Foreknowledge and Explanatory Dependence," *European Journal for Philosophy of Religion*, vol. 9, no. 4, pp. 51-61.
- Todd, Patrick. 2013. "Soft Facts and Ontological Dependence," *Philosophical Studies*, vol. 164, no. 3, pp. 829-844.
- Todd, Patrick, and Fischer, John Martin. 2013. "The Truth about Foreknowledge," *Faith and Philosophy*, vol. 30, no. 3, pp. 286-301.
- Westphal, Jonathan. 2011. "The Compatibility of Divine Foreknowledge and Freewill," *Analysis*, vol. 71, no. 2, pp. 246–252.
- -----. 2012. "The Logic of the Compatibility of God's Foreknowledge and Human Freewill," *Analysis*, vol. 72, no. 4, pp. 746-748.