REDUCTIO AD ABSURDUM AND SLIPPERY SLOPE ARGUMENTS: TWO SIDES OF THE SAME COIN?

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Abstract. *Despite the fact that the reductio ad absurdum argument is a valid deductive form, while the slippery slope argument is most often presented as a fallacious form of inductive argument, the two argument types bear some striking similarities. Investigation of these similarities reveals some more universal difficulties in the teaching of informal logic, and, in particular the difference between strong informal arguments and fallacious ones.*

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Proceeding through the standard Introductory Logic or Critical Reasoning course material each year, one typically will cover both the *reductio ad absurdum* argument and the slippery slope fallacy. Because of the way that such courses are usually arranged, however, one rarely has occasion to consider the two argument forms juxtaposed. Given that the *reductio ad absurdum* argument is presented as a formal proof technique, while the slippery slope form is taught in another section of the course, focusing on issues of relevance and presumption of non-granted premises, neither textbooks nor typical the course structure offers any occasion to consider possible connections between the two.[1] When they are juxtaposed, however, a striking relation between the two becomes apparent. Although the one is a valid deductive form, used to disprove some claim, while the other is a claim of causal connection, which is usually pointed to as too weak to establish its purported conclusion, the two argument forms share a common inner structure. The true difference is whether the argument is employed in a closed, axiomatic system, or in a rich, indefinitely complex real-world situation. A telling detail about this claim is that, given the appropriate circumstances, the very same argument could be analyzed either deductively or non-deductively.[2]

The overall argument of Hobbes's *Leviathan* is a classic example that arguably lends itself to analysis via both of the two argument forms. The general outline of Hobbes's argument is as follows: to prove that government is necessary, Hobbes assumes the opposite—suppose that we have a state of no government, what he calls a "state of nature".

[1] For instance, a recent text that reflects this circumstance is Good Reasoning Matters! A Constructive Approach to Critical Thinking, by Leo A. Groarke, Christopher W. Tindale, and Linda Fisher (Second Edition; New York: Oxford University Press, 1997), Ch. 9, Sec. 2, and Ch. 11, Sec. 3 respectively. We are relying on their discussion of the two argument forms in the present paper.

[2] Merrie Bergmann, James Moor, and Jack Nelson, The Logic Book (Third Edition; New York: McGraw-Hill, 1998), 15-16 claim that an appropriate argument can be evaluated both deductively and nondeductively.

Hobbes then argues that this situation entails absurdities, or consequences that no reasonable person would find tolerable. In Hobbes's words, it would be a "constant state of war, of one with all." There would be no security, bounty, or peace. "The life of man", he surmises, would be "solitary, poor, nasty, brutish, and short."[3] In other words, one would end up doing things that would countermand what one wanted to do. This intolerable state amounts to a "contradiction," or absurdity, in Hobbes's mind; i.e., it is unreasonable; thus it shows (proves) that government is necessary, or indispensable, for human living. Hobbes does seem to take this argument as a *reductio*, for he remarks that "as it is there [in scholarly disputations] called an absurdity, to contradict what one maintained in the beginning: so in the world, it is called injustice, and injury, voluntarily to undo that, which from the beginning he had voluntarily done."[4]

According to Douglas Walton's recent definition, "the technique of *reductio ad absurdum*, where one party starts from a second party's initial assumption, and reasons through a sequence of inferential steps to some 'absurdity', a proposition that is clearly unacceptable to both parties or to any reasonable person,"[5]Hobbes's argument again seems clearly to be understandable as possessing the form of a *reductio*. Formally, it says:

Assume ~g	[no government]
Derivea & ~a	[contradictory actions]
Conclude g	[government]

One scholar who interprets Hobbes's argument in this way, Antony Flew, argues that Hobbes didn't mean to refer to an actual historical state of affairs that led from the state of nature to government, as John Locke does. Rather, the transition he intends is of a hypothetical nature.[6]Thus it is on Hobbes's own assumptions regarding what constitutes necessary and sufficient conditions for social changes that the argument follows. Particularly here, perhaps, the diagnosis becomes clear. If Hobbes is making a nominalist argument, wherein the conclusions reached are reached through conceptual analysis, one might well be prepared to concede that the argument is of the *reductio ad absurdum* form. But if, on the other hand, the argument is conceived to be making claims about the actual world and events that would/will/might happen therein, the argument can only be conceived of as offering an account of a slippery slope, and, in fact, one in which the slip could be stopped.

What, then about the claim that Hobbes's argument suggests instead a slippery slope? Slippery slope arguments, although arguably distinguishable into several different types,[7]are often presented as causal arguments that have as essential elements in their premises causal

[3] Thomas Hobbes, Leviathan, ed. Michael Oakeshott (New York: Collier Books, 1962), p. 100.
[4] Hobbes, p. 165
[5] Douglas Walton, Slippery Slope Arguments (New York: Clarendon Press, 1992), p. 23. While many scholars would claim that the reductio form does not occur unless a formal contradiction can be derived from the premises, this does not seem to be the way in which Socrates, a noted proponent of the form, used it. For many, including Walton, Spinoza, and ourselves, a derived proposition that is clearly unacceptable to anyone understood to be taking in an argument is strong enough to count as having reduced the premise(s) on which it is grounded to absurdity.
[6] Antony Flew, A Dictionary of Philosophy (New York: St. Martin's Press, 1979), 140; Hobbes entry.
[7] Although Patrick Hurley (A Concise Introduction to Logic, 7th ed. [Belmont, CA: Wadsworth, 2000], for instance, as well as Vincent Barry (Practical Logic: An Antidote for Uncritical Thinking, 5th ed[New York: Harcourt Brace College Publishers 1998]) and Groark, Tindale,and Fisher, among others, characterize slippery slope arguments as essentially causal, Walton distinguishes four types: a sorites version, a causal version, a precedent version, and what he calls "full" version of the slippery slope, comprised of the other three forms.

claims that suggest an inevitable continuum or chain. Formally, one often sees slippery slope arguments characterized as follows:

> A causes B, B causes C, and so on to X.
> X is undesirable (or X is desirable).
> Therefore, A is undesirable (or A is desirable).

According to the most general understanding of a slippery slope argument, it would seem that the causal chain (or the heap that would eventuate from sufficient grains of sand) could slip either toward something desirable or toward something undesirable. In the version that is arguably parallel with the *reductio ad absurdum* argument, of course, only the version that has ultimately negative consequences, resulting in the rejection of the initial premises, is relevant.[8] The difference here is that, rather than deriving a formal contradiction from the initial premise, the slippery slope results in an "absurdity", something that the arguer maintains that no reasonable party to the discussion would find tenable. Again, then,

> No government (A) leads to no security (B); no security leads to no bounty (C);
> No bounty leads to no peace, or war (X).
> War is mutual destruction, an absurdity for those seeking their own good,
> Therefore, no government is an unacceptable premise.

Hobbes's language is suggestive of a causal reading: e.g., "where there is no common power, there is no law; where no law, no injustice."[9] Consequently, Hobbes's hypothetical claims can be interpreted as general statements of either conceptual connections or as causal claims. In fact, a quick look at Chapter Thirteen of the *Leviathan* reveals that his writing about "the natural condition of mankind as concerning their felicity and misery"[10] can be read in either way, and without offense to the text in either case. So, interestingly, his argument seems to be interpretable either as a causal slippery slope, or as a case of *reductio ad absurdum*, and without basing that dual ascription on equivocal readings.

A couple of observations regarding the parallel between these two argument forms seem worth mentioning. The first is that while in general negative slippery slope arguments can be expressed as *reductios*, it is not the case that *reductio* arguments suggest corresponding slippery slope arguments, since, as is well known, all informal arguments can be formalized, but the reverse is not the case. Related to this is the fact that *reductioad absurdum* is an accepted valid deductive argument form, while the slippery slope argument often produces contention; it is an informal argument form with clear potential for going awry, and in many texts is presented solely as a fallacious form, due to essential semantic or informational inadequacies.[11] The question of whether a fallacy has occurred in a slippery slope argument is

8 Groarke, Tindale, and Fisher include both positively- and negatively-directed arguments in their characterization of the slippery slope. We noticed that the positive-directed version of the fallacious slippery slope argument seems to show another interesting feature; it appears to parallel the fallacy of affirming the consequent: $p \rightarrow q$, q (is desirable), $\therefore p$. This suggests that at one level of abstraction both slippery slope and reductio arguments can be reduced to modus tollens: $p \rightarrow q$, ~q (is impossible, or unreasonable to all parties), $\therefore \sim p$.

9 Hobbes, p. 101.

10 Hobbes, p. 98.

11 See Hurley or Barry (cited above) for examples of discussions of slippery slope as essentially (informally) fallacious. Groarke, Tindale, and Fisher, by contrast, in the text mentioned in note 1, present slippery slope reasoning as having both good and bad versions. In addition, much has been written about just what is wrong with slippery slope arguments when something is, with hugely

generally based on the issue of whether inevitability from step to steps in fact exists, or whether the meanings of the terms have been adhered to sufficiently strictly. The *reductio*, then, imparts certitude of the incompatibility of a particular premise with established axioms of a logical system, while the negative slippery slope argument, even if it provides good reasons for rejecting the original premise, is always capable of refutation by the addition of further information.

What, then, is the key to the diagnosis of the difference between the informal slippery slope argument, which can be cast in formal terms, and the *reductio ad absurdum* argument form, which does not bear a parallel relation to the slippery slope? We believe that it is a difference that exists between many formal and informal arguments, and one that causes students great difficulty in their study of informal fallacies, which they don't seem to experience in their study of formal logic. In order to cast a slippery slope argument in the form of a *reductio*, it is necessary to completely specify the terms of the argument, and the links among each of the steps. In the case of the sorites, one of the two most widely discussed types of slippery slope arguments;[12] this would require clarifying the very language whose ambiguity is considered by many to be the source of the slope's slipperiness.[13]That is, recasting this type of slippery slope argument in deductive form would force the exposure of the source of the apparently inevitable movement between steps, and thus, while clearly establishing the logical connections, would render the argument unpersuasive. It is the unnoticed ambiguity, then, that allows for the slippage.

In the case of causal slippery slopes, a deductive rendering of the argument could only be achieved through circumscribing the content of the argument to fit within the parameters of a system of propositional logic. That is, every term would have to be completely specified. Again, disambiguating the language would be a necessary first step, and a step which would remove the threat of slippage. 'X causes Y' would have to be understood as uncontroversial and categorical; causes would have to become exhaustive and completely articulated sets of reasons. Retaining the complexity inherent in causal analyses of the actual world, and in the

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conflicting and mutually undermining results. For instance, some, such as Kenton Machina, Basic Applied Logic (Glenview: Scott, Foresman, and Coompany, 1982), argue that slippery slope arguments are fallacious because the vagueness of the concepts involved in such arguments permit the step that begins the irreversible slide; others, on the other hand, such as Max Black, in "Reasoning With Loose Concepts," Dialogue, Vol. II, 1963, pp. 3-4, argue that the argument form is clearly valid, and that the fact that the problem emerges from the vagueness of the concepts involved shows just that—it is a semantic problem, not a logical one. With a similar approach, Dale Jacquette argues in "The Hidden Logic of Slippery Slope Arguments," Philosophy and Rhetoric, Vol. 22, No. 1, 1989, pp. 59-69 that the form isn't itself fallacious, but that falsehoods emerge because we condense premises that should be expanded, or because we unpack premises that are better left condensed. In response, Roy Sorensen ("Reply to Jacquette," Philosophy and Rhetoric, Vol. 22, No. 3, 1989, pp. 195-202) declares that Jacqette says that the whole discussion has gone awry through confusing uses of the terms 'valid' and 'fallacious,' and misrepresenting the distinction between logical and rhetorical mistakes.

12 Most public discussions of slippery slope arguments seem to focus either on causal slippery slope arguments or on sorites. The latter, which translates to 'heap', was invented by Euclides's student, Eubulides, creator of many paradoxes. It can be put in the following form:

A collection of one stone is not a heap.
A collection of two stones is not a heap.
A collection of three stones is not a heap. (etc.)
Therefore, no collection of stones is a heap.

Although Walton distinguishes four types, for the purposes of this discussion it is reasonable to suggest that the precedent form and what he calls the "full slippery slope argument" are derivative from the other two.

13 Some of those individuals are mentioned above, in footnote 8.

way in which we talk about those causes (even to the point of arguing extensively in various journals about what we even mean by 'cause') would require taking the argument beyond the range of deductive analysis. It would amount to the difference in creating a climatic model which perfectly predicts the weather, based on all and only the provided parameters, and actually predicting the weather. The disambiguating and complete articulation that formalization entails, while tightening the connection between the argument's premises and conclusion to the level of necessity, is tremendously costly in terms of the amount of information the argument conveys, or, in other words, in terms of its connection with the world. For the interrelations between premises and conclusion to be absolute, the terms of an argument must concern determinate and defined classes. With respect to both sorites and causal slippery slope arguments, rendering the form of the argument explicit would require exposing the controversial nature of its content.

It is at least worth noting that if causation were, as Spinoza,[14] for instance, or as Leibniz[15] ideally understand the world, a logically necessary relation between one set of conditions and another (and given the infinite intellect necessary to understand those connections), there would be no such thing as a fallacious causal slippery slope argument, or even a merely strong one; there would be only "valid" ones. The word 'cause' would be unambiguous; 'A causes B' would mean (perhaps) that 'A is logically necessary and sufficient for B,' so that if A caused B, and B caused C, and C were not compatible with the best of all possible worlds (for Leibniz), or were incompatible with something having a stronger reason for existence (for Spinoza), A would be impossible. Thus, negative slippery slope and *reductio ad absurdum* arguments would amount to the same thing. In the case of the Hobbesian example cited above, such a situation would exist if all the connections between human motivations and human actions were perfectly understood, as well as all the implications of those motivations and actions of individuals for social systems, etc. In that perfectly understood and describable case, the state of nature would in fact entail the absurdities that would be seen to logically preclude it (given the rationality of the mind considering the argument).Alternatively, Hobbes could simply stipulate the parameters necessary to circumscribe the argument sufficiently to attain certainty. In fact, this must be close to what Flew assumes Hobbes does when he understands Hobbes's transition from the state of nature into civil society as a hypothetical one. If Flew assumed otherwise, thinking for instance that Hobbes was actually attempting to demonstrate his point based on contingent historical facts, he would not be able to attribute to Hobbes the degree of certainty his reading of the argument as a *reductio* suggests.

The differences between slippery slope and reductio arguments, then, appear to be the differences that plague the identification of many informal fallacies: informal reasoning

[14] In Ethics I, Spinoza presents as axiomatic that "The knowledge of an effect depends on and involves the knowledge of a cause" (Axiom IV). He further says, in Proposition XI that "Of everything whatsoever a cause or reason must be assigned, either for its existence, or for its non-existence--e.g., if a triangle exists, a reason or cause must be granted for its existence; if, on the contrary, it does not exist, a cause must also be granted, which prevents it from existing, or annuls its existence." That is, he understands cause, much as does Leibniz, as a sufficient (logical) reason for the existence for something, rather than as a matrix of efficient causes dependent for their discovery upon the essentially uncertain process of induction.

[15] Leibniz, in the "Monadology" (1714), Sec. 32, articulates his omnipresent principle of Sufficient Reason, which says that "there can be found no fact that is true or existent, or any true proposition, without there being a sufficient reason for its being so and not otherwise, although we cannot know these reasons in most cases." Like Spinoza, Leibniz maintains that causation in the deepest sense is to be understood as a logical and necessary connection, rather than as an inductively derived uncertain one, although for practical purposes we must rely on much less rigorous connections.

depends upon judgment, upon what is not necessitated by certain axioms, but by what is determined by what Leibniz called "the balance of reasons". Whether an argument appeals to a correct authority for support, or falls fault to the *ad vericundiam* error is largely dependent upon the judgment of those who are familiar with the person whose authority is being appealed to, the kind of question at issue, and the relevance of the authority's special area of expertise to the issue at hand. In many cases students object to grades given on tests of their knowledge of informal fallacies, and in many cases, they bring attention to facts not considered by the test creator. Fallacies of relevance, for example, are generally presented in classes as obvious cases, for the purpose of illustration, but in reality, science has learned again and again that what was believed to be irrelevant to experimental results was in fact highly relevant, and called in some cases for a complete re-vamping of theoretical structure. Were the claim that a certain result is something that "no reasonable person would desire" as clear as "is incompatible with the best of all possible worlds," (assuming that one could understand what that meant), there would be no difference between the *reductio ad absurdum* and the slippery slope argument. The problem, alas, is that there are more things in heaven and earth than are dreamt of in our philosophies.