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Logical Proficiency and Rationality

Paul Boghossian has claimed that traditional conceptions of rationality are threatened by externalism, the thesis that propositional content is in part determined by features of the social and physical environment of which we may be unaware. For externalism calls into question the view that propositional content is "epistemically transparent" in the sense that sameness and difference of content is unerringly detectable upon reflection by competent speakers. And Boghossian is convinced that epistemic transparency is central to our conception of rationality as the ability to "make one's thoughts conform to the principles of logic on an *a priori* basis"(Boghossian 1994: 42).[1] For, without epistemic transparency, it is impossible to avoid the fallacy of equivocation and related mistakes. Given the tension between externalism and epistemic transparency, Boghossian poses the following dilemma (hereafter, "Boghossian's dilemma"):

> We must either reject such [externalist] conceptions of propositional content [that have it as a consequence that *de dicto* contents are not transparent], or we must show how to refashion the idea of reasoning so that it no longer consists in the disposition to conform to logic on an *a priori* basis. (Boghossian 1994: 48)

I will argue that Boghossian's dilemma is a false one: we needn't "refashion" our conception of reasoning in order to retain externalism and reject epistemic transparency. By analogy to methods of evaluation for applications of formal logic, I will explain how rational misapplications of logic are possible in an informal setting, and how such mistakes can be distinguished in a principled way from irrational misapplications of logic.

Boghossian's dilemma is motivated by cases like the one involving Kripke's character named "Peter" (Kripke 1979: 255 - 256). Peter believes that Paderewski, the Polish concert pianist, has musical talent. Later, he learns of a politician of the same name and, assuming that politicians are musically challenged, comes to believe that Paderewski doesn't have musical talent. But Peter doesn't revise his earlier belief. For he thinks his beliefs are about different men, and consequently sees no contradiction. But in fact his beliefs are contradictory because there is only one Paderewski at issue

in both beliefs. Although it is possible to save Peter from the charge of contradiction by claiming that the name "Paderewski" is ambiguous in Peter's uses of it, I am granting to Boghossian that externalists should not accept the postulation of an ambiguity here, and so should accept that Peter's beliefs are contradictory. While this assumption is debatable, my goal is to argue that Peter's rationality and mastery of logical laws can be acknowledged even conceding that his beliefs are contradictory.

Following Kripke, Boghossian argues that Peter cannot escape the charge of irrationality if he is attributed contradictory beliefs, for "the norms of rationality are the norms of logic" (Boghossian 1994: 42). We may not know whether many of our beliefs are true or false without consulting experience, but we can and should be able to determine their logical implications. Boghossian puts the point this way:

> . . . *any* rational subject, regardless of his external conditions, may be expected to obey certain laws. . . namely, those generalizations that mirror the *introspectively obvious* logical consequences of a person's propositional attitudes. (Boghossian 1994: 42 - 3; second emphasis mine)

Anticipating the response that Peter's contradictory beliefs are excusable because their contradictory character is not "introspectively obvious," Boghossian objects that "practically any contradictory belief will be absolvable under the terms of this proposal" (Boghossian 1994: 49). Boghossian rightly notes that irrationality often *consists* in an inability to see logical contradictions. Boghossian thus challenges the opponent of transparency to specify *which* contradictions a rational reasoner may be expected to notice *a priori,* to provide a criterion to distinguish rational logical mistakes like Peter's from irrational ones (Boghossian 1994: 42).[2] Call this "Boghossian's challenge."

I will argue that Boghossian's challenge can be met. I'll begin by showing how students of standard first order logical systems can make mistakes in the application of those systems that do not compromise their mastery of formal logical laws. I'll then show how to extend my discussion of the formal case to informal cases like Peter's, explaining how mistakes like Peter's can be distinguished from irrational logical errors.

In a standard formal system for first order logic, notions such as logical truth and validity are not typically defined by appeal to propositional contents and their relations. Rather, the focus is always on sentences or formulas that instantiate certain schematic logical forms. Such schemata contain dummy letters that stand in place of expressions of the object

language, displaying the logical structure shared by all of their instances. Notions such as logical truth can be defined by appeal to such schemata, as in the following definition of Quine's:

> A logical schema is *valid* if every sentence obtainable from it by substituting sentences for simple sentence schemata is true. A *logical truth,* finally, is a truth thus obtainable from a logical schema. (Quine 1986: 50)

Logical laws can also be stated by appeal to schemata. A logical law is the claim that all sentences instantiating a certain schema are true. So, for example, construing "p" and "q" as schematic letters, it is a logical law that all instances of the conditional schema "[p & (p → q)] → q" are true. Similarly, no instance of the schema "Φα & ~Φα" is true.

To apply schematic logical laws, it must be determined whether particular sentences instantiate particular schemata. In formal logical theory, this is unproblematic: it is a syntactic matter whether a sentence of a formal language instantiates a particular schema. The application of logical laws in formal systems is thereby rendered unambiguous – even mechanical. However, as any teacher of logic knows, to say that formal logic is mechanical and to say that it is easy are two different claims. Of the many daunting tasks facing logic students, two aspects of logical proficiency are particularly relevant at this juncture.

For the sake of labels, I'll call these two aspects of logical proficiency "formal reasoning" and "translation." For the former, a student must master the formalism, learning what the schematic logical laws of her system are, and how to apply those laws to sentences of her formal language. So for example, the student learns how to construct proofs in a formal proof system, how to recognize substitution instances of valid schemata, *etc.* The student's mastery in applying logical laws within her formal system is manifested in all of these activities, and is independent of her ability to apply her formal system to arguments expressed in natural language. For in order to apply the formal system, natural language sentences must be "translated" into sentences of the formal language, thereby specifying their schematic logical form so that schematic logical laws can be applied to them. Importantly, no amount of proficiency at "formal reasoning" is sufficient to guarantee proficiency at "translation." For correct translations are not logically implied by schematic logical laws. And translations are expected to mirror what we would ordinarily take as the logical consequences of the original sentence, but there is no judging translations for adequacy on this score without going beyond the formal system. Accordingly, the student's

ability to translate constitutes a separable (and, in logic classes, separately tested) aspect of logical proficiency. Acknowledging this point is the key to recognizing the possibility of logical errors that do not call into question the student's mastery of schematic logical laws.

Mistakes in translation need not be reflected by mistakes in formal reasoning. For example, suppose a student is asked to translate the sentence "All whales are mammals." The answer "$\forall x(Wx \rightarrow Mx)$" would be a correct translation of this sentence. However, as all too often happens, our student may mistakenly answer "$\forall x(Mx \rightarrow Wx)$." Having given this answer, she doesn't compromise her proficiency in formal reasoning if she applies the rule of universal instantiation to infer the sentence "$Ma \rightarrow Wa$," despite the fact that this sentence is not implied by any *correct* translation of our original sentence.

We may accordingly distinguish two ways of assessing applications of formal logic: applications of formal logic can be assessed relative to *correct* translations; or they can be assessed relative to *assumed*, perhaps incorrect, translations like our student's. A student's proficiency in formal reasoning is measured by the latter sort of assessment. Nevertheless, the fact that our student reasons correctly from her "assumed" translation doesn't show that she has correctly assessed the logical implications of the original ordinary language sentence: "$Ma \rightarrow Wa$" does not in fact follow from any correct translation of the sentence "All whales are mammals." So our student does make a mistake, albeit a mistake that doesn't compromise her proficiency with the logical formalism in question.

Boghossian had complained that, with the rejection of transparency, there is no criterion to distinguish rational misapplications of logic from irrational errors. Within the context of a formal system, this complaint is easily answered: rational misapplications of logic involve mistakes in translation, but no corresponding mistakes in formal reasoning. For as we have seen, acceptance of schematic logical laws does not guarantee correct translation, and proficiency in applying schematic logical laws is assessed relative to assumed translations.

Were our friend Peter a logician, we could easily confirm that he has made a rational mistake. For if he were to translate the conjunction of his beliefs about Paderewski's musical talents into logical notation, he would offer an instance of the consistent schema "$\Phi\alpha \,\&\, \sim\Phi\beta$" rather than an instance of the *contradictory* schema "$\Phi\alpha \,\&\, \sim\Phi\alpha$." Because 'Paderewski' is unambiguous even in Peter's uses of it, he would be mistaken to reject the latter schematization. Nevertheless, Peter's mistaken translation doesn't compromise his proficiency at formal reasoning. Indeed, *given* his assumed translation, Peter would be wrong to claim that his beliefs are contradictory.

Because Peter does not make any mistakes in formal reasoning relative to his assumed translations, his mistake in applying formal logic to ordinary language is rational. The distinction between formal reasoning and translation accordingly answers Boghossian's challenge: rational mistakes are correct relative to *assumed* translations, but incorrect relative to some *correct* translation.

The foregoing defense of Peter's rationality is made easy by pretending that Peter is applying a formal logical system. But in ordinary contexts logical reasoning does not proceed through distinguishable steps of translation and formal reasoning: we reason using natural languages, not by first translating natural language sentences into some artificial language for which the relation of schematic instantiation is syntactically defined. Accordingly, if the foregoing discussion is to help solve Boghossian's dilemma, the point that rational logical mistakes are mistakes in translation rather than formal reasoning must be adapted to informal contexts.

When logical matters are discussed in ordinary practice, schemata are obviously not mentioned. However, the crucial part of standard first order definitions of logical truth like Quine's is not the schemata themselves, but the notion of truth preservation under uniform substitution. Although ambiguity and other complications preclude any syntactic guide to uniform substitution in informal contexts, the notions of shared logical structure and truth preservation under substitution are nevertheless implicit in a standard form of argument used in ordinary practice: argument by analogy.

In arguments by analogy, an interlocutor's argument is challenged by producing an argument that is agreed to be invalid, but which (allegedly) has the same "form" as the interlocutor's original argument. Although sameness of form isn't syntactically defined in informal contexts, syntactic similarity is a *prima facie* indication that the arguments exhibit the same pattern of reasoning. For the one argument can (allegedly) be obtained from the other by simply exchanging sentences for sentences. To block the analogy, some reason for discounting the syntactic similarity of the arguments must be introduced. If no disanalogy can be found, the argument from analogy succeeds.

For example, suppose Rush Limbaugh were to make the following argument on his radio show:

a. If Clinton is going to be impeached, he'll look to Hillary for advice.
b. But Clinton always looks to Hillary for advice.
c. So Clinton is going to be impeached.

Although Rush would certainly never commit such a fallacy, one ordinary means at our disposal for catching him in his mistake is to offer a syntactically analogous argument that has a clearly false conclusion:

a. If Clinton is twenty feet tall, he gets lots of media attention.
b. Clinton gets lots of media attention.
c. So Clinton is twenty feet tall.

At this point, Rush has a problem. For although the syntactic similarity between these two arguments does not *guarantee* that they have the same form, the similarity does raise a *prima facie* challenge to the validity of Rush's argument. Pending the identification of some relevant disanalogy between the two arguments, such as an ambiguity or ellipsis, Rush's argument is discredited.

Although Rush cannot save himself in the example above, Peter is in a better position. To challenge Peter, we might claim that having his beliefs about Paderewski is like believing both that Lech Walesa is Polish and Lech Walesa isn't Polish. The strategy here is to provide a pair of statements Peter agrees to be contradictory and to urge that Peter's beliefs about Paderewski fit the same pattern. To block the analogy, Peter must present some reason for discounting the syntactic similarity between the statements he uses to express his beliefs about Paderewski and the corresponding statements about Walesa. From Peter's perspective, the disanalogy is clear: whereas the statements about Walesa are about a single man, his statements about Paderewski are about different men. *Given* this assumption, Peter is correct to claim that his beliefs about Paderewski are not logically related like the contradictory statements about Walesa, but rather like the statements that Paderewski is musically talented and that Lech Walesa is not, or the statements that (Sonny) Bono was musically talented and Bono (of the band U2) is not.

Unfortunately for Peter, his assumption that there are two Paderewskis is false. Consequently, he is mistaken in his assessment of logical analogy: his beliefs about Paderewski are in fact logically analogous to the pair of statements about Walesa rather than the pair of statements about the two Bonos. Still, it is clear that appeal to logical principles like the principle that everything is identical to itself will not enable Peter to detect his mistaken assessment of logical analogy. Peter's mistake is accordingly like a mistake of "translation" in a formal context: his mastery of logical principles is insufficient to correct the "translation" reflected in his assessments of logical analogy, and Peter reasons correctly *relative to* those

assessments. Even without a formal system, then, there is an ordinary analog to the distinction between translation and formal reasoning. Like our student whose mistake in translation was not reflected by any mistake in formal reasoning, Peter reasons correctly given his assessment of logical analogy. Irrational logical errors, unlike Peter's, are unmollified by reasonable misassessments of logical analogy. Boghossian's challenge can accordingly be met in an informal context as well as a formal one: rational logical mistakes like Peter's can be distinguished from irrational logical mistakes like Limbaugh's.

Ironically, the rejection of epistemic transparency is key to acknowledging the rationality of false assumptions like Peter's: given the failure of transparency, there is no reason to expect Peter to see that his uses of 'Paderewski' are unambiguous, and so no reason to expect him to detect the falsity of the assumptions which motivate his mistaken assessment of logical analogy. That is to say, given the failure of transparency, there is no reason to expect Peter to be able to tell *a priori* that an appropriate logical analog for his beliefs about Paderewski's musical talents is a contradictory pair of statements, rather than a consistent pair of statements like Peter's statements about the respective musical talents of the two Bonos. Although Peter was wrong to analogize his beliefs about Paderewski's musical talents as he did, the fact that ambiguities are possible, as in the 'Bono' case, suffices to show that his mastery of logical laws can't prevent his mistake. Still, Peter's need to invoke an alleged ambiguity to block the argument from analogy leveled against him answers Boghossian's concern that no logical mistakes will count as irrational: irrational mistakes cannot be explained away by identifying assumptions that rationalize, if not vindicate, mistaken assessments of logical analogy.

The foregoing considerations suggest a new way of understanding the claim that rationality requires the *a priori* application of logic. Whereas Boghossian takes the *a priori* character of logic to preclude misapplications of logic, we can salvage what is correct about the claim that logic is *a priori* without being so strict. Although precluding all misapplications of logic is too demanding, we can and do expect rational, logically proficient individuals to apply logical laws correctly *given* their assessments of logical analogy. Since a rational individual may be mistaken in such assessments without compromising her acceptance and subsequent application of logical laws, such mistakes do not tell against her mastery of logical laws or her rationality. Since rationality is properly evaluated relative to *assumed* assessments of logical analogy, I conclude that Boghossian's dilemma is false: we can both reject epistemic transparency and accept the (properly

understood) conception of rationality as the *a priori* application of logical laws.

Notes

1. Boghossian is not claiming that rationality requires consistency under deductive closure, but only that rational reasoners be able to recognize simple logical relations such as contradictions of the form 'p & ~p.'

2. Furthermore, appeals to translucency threaten the conception of rationality as the *a priori* application of logic: if it turns out that detecting sameness or difference of content always requires empirical investigation, so too will the application of logic.

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