**WHAT DOES LOGIC HAVE TO DO WITH JUSTIFIED BELIEF?:**

**WHY DOXASTIC JUSTIFICATION IS FUNDAMENTAL**

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As George Boole (1854/1958) saw it, the laws of logic are the laws of thought, and by this he meant, not that human thought is actually governed by the laws of logic, but, rather, that it should be. Boole’s view that the laws of logic have normative implications for how we ought to think is anything but an outlier. The idea that violating the laws of logic involves epistemic impropriety has seemed to many to be just obvious.

It has seemed especially obvious to those who see propositional justification as more fundamental than doxastic justification. Whatever other principles are required for defining propositional justification, the laws of logic seem indispensable. The idea that violation of the laws of logic involves some sort of epistemic impropriety—whatever the peculiarities of our psychology may be—has served as a fixed point around which defenders of the fundamentality of propositional justification are largely united, whatever their other differences.

In this paper, I defend the contrary view, that the laws of logic do not, in virtue of being the laws of logic, have implications for a theory of justified belief. Moreover, I defend the view that the notion of doxastic justification is more fundamental than the notion of propositional justification. The connection between these two apparently unrelated claims is an important focus of this paper.[[1]](#endnote-1)

I

Here is one very natural way to think about justified belief. Elsewhere, I have referred to it as the Arguments-On-Paper Thesis. (Kornblith, 1980) On this way of thinking about things, questions about justification are addressed by thinking about the quality of certain arguments. Imagine for a moment that we were to list all of the propositions which a certain subject believes. We may now say that a subject is propositionally justified in believing a proposition just in case that proposition requires no argument, or, alternatively, there is a good argument for the proposition on the basis of appropriate propositions on the list. A subject is doxastically justified in holding a belief just in case that subject holds the belief and is propositionally justified in holding the belief, and either the proposition believed requires no argument and is held on that basis or the subject holds the belief on the basis of the argument in virtue of which it is propositionally justified.[[2]](#endnote-2)

Clearly, such a view needs to be filled out in a number of ways. Someone who holds such a view needs to say which propositions, if any, require no argument. In addition, the propositions which may serve as justifying premises need to be identified. And, of course, one needs to say what constitutes a good argument. Different theorists will fill out this view in a variety of ways.

Foundationalists will hold that there are certain propositions which require no argument at all. Perhaps such propositions are indubitable, or they are infallible, or they are self-evident, or they have a presumption in their favor, or some such thing. On any foundationalist version of the Arguments-On-Paper Thesis, however, there is some class of propositions which has a special epistemic status in virtue of which they require no argument. We can put a star next to each such proposition on the list of propositions which a subject believes. A good argument, on this view, will then be one which takes only starred propositions as premises. But of course, there will be additional constraints on good arguments specifying the favored relationship or relationships between premises and conclusions. I will come back to this issue.

Coherentists will hold that there are no propositions which require no argument. No proposition, on this view, has the special epistemic status which foundationalists claim for their favored premises. But far from being more selective about the premises of good arguments, coherentists will allow every proposition on the list of propositions believed to serve as a premise; every proposition on the list gets a star. A good argument, for a coherentist, will have a very long list of premises; it must include every proposition a subject believes. And here too, additional constraints are needed specifying the relationship between premises and conclusions in good arguments.

What then is the proper relationship between premises and conclusion in a good argument? This, it seems, is the subject matter of logic. Were we to limit the notion of logic here to deductive logic, however, our account of justified belief would be extremely impoverished. We should thus acknowledge that the relevant notion of “good argument” at issue here is broader than deductive validity. What is needed to fill out this view is an inductive logic as well, or an account of inference to the best explanation, or abductive inference, or some such thing. Some will wish to appeal to probabilistic notions as well. Although the details here matter, and they vary significantly among different theorists, the big picture is quite straightforward: Propositionally justified belief is explained in terms of the notion of a good argument, and goodness of argument is explained by the laws of logic, both deductive and non-deductive, together, perhaps, with a theory of probability.

Questions about justified belief are thus addressed in apsychological terms. This crucial feature of the Arguments-On-Paper Thesis is obscured by a familiar bit of terminology: We speak of rules of inference within a logical system, thereby eliding the important distinction between a certain psychological process, namely, inference, on the one hand, and logical and probabilistic relations among propositions, on the other. This terminology both hides the transition from claims about the logical realm to claims about the psychological, and it thereby makes the Arguments-On-Paper Thesis seem entirely innocuous when, instead, it involves a very powerful substantive claim. The Arguments-On-Paper Thesis endows the laws of logic with fundamental normative significance. Such significance cannot, of course, be provided by terminological fiat. It will therefore be important to bring the transition from the psychological to the logical out from its hiding place in a convenient bit of terminology into the light.[[3]](#endnote-3)

II

Let me present a motivation for looking at justified belief in a different way. I begin with an anti-skeptical assumption: we have a great deal of knowledge and justified belief. Some, no doubt, will see this as cheating. The rejection of skepticism must be earned, they will say, rather than simply assumed. I certainly understand this sentiment, but I will proceed with my working anti-skeptical assumption nonetheless. Indeed, it seems to me virtually undeniable that we have a great deal of knowledge and justified belief. From the most modest epistemic achievements of everyday life—our knowledge of our whereabouts, the objects in front of us, the likely consequences of various actions which we might undertake, and so on—to the very substantial epistemic achievements of the sciences, our lives are permeated by knowledge and justified belief and our thoughts and our actions are incomprehensible without supposing that knowledge and justified belief are widespread. In what follows, I will simply focus on justified belief.

What I suggest is that we view justified belief as an epistemic phenomenon to be examined, in much the same manner as various physical phenomena, such as heat, or motion, or lightning may be viewed as phenomena worthy of examination and elucidation. Such an examination can only begin if we embark on our study with at least a rough capacity to recognize many instances of the phenomenon at issue. Thus, for example, when Galileo set out to measure temperature for the first time, he took himself to have a very rough recognitional capacity for temperature differences. He knew that a summer’s day in Genoa was warmer than a winter’s day at the top of the Matterhorn, even if he was in no position to quantify that difference. He knew that steam was hotter than water which, in turn, was warmer than ice. He could recognize gross differences in temperature, or at least many such differences, and this was a necessary condition for so much as beginning to study temperature. If he had no capacity for making any judgments about temperature at all, then he would have been in no position to undertake, or even conceive of, a study of such a phenomenon.

So too, I shall assume, with justified belief. We have a first-pass recognitional capacity for justified belief, and it is this recognitional capacity which affords us epistemic access to the phenomenon we wish to examine. Just as with Galileo’s study of temperature, we may have a good many beliefs about the phenomenon at the beginning of our study, but many of these pre-theoretical beliefs will need to be modified or abandoned as our study progresses. We make use of our recognitional capacity to get our study going, and then we examine the instances of the phenomenon to see what features those instances share, what it is that provides the theoretical unity to the phenomenon, what it is that makes the phenomenon a fit object of theoretical investigation.

This sort of assumption is certainly not unique to me, or to philosophers who share my view about the Arguments-On-Paper Thesis or the relationship between propositional and doxastic justification. Roderick Chisholm, for example, makes a similar assumption about the phenomenon of knowledge.

We presuppose, first, that there *is* something that we know and we adopt the working hypothesis that *what* we know is pretty much that which, on reflection, we think we know. (Chisholm, 1977, p. 16)

Chisholm here adopts the very assumption about knowledge that I make about justified belief: he assumes, although he does not make use of this terminology, that we have a good first-pass recognitional capacity for instances of knowledge. And this, as he sees it, is absolutely necessary for embarking on a study of the nature of knowledge. Indeed, he makes the very same assumption about justified belief.

This is a working hypothesis, as Chisholm puts it, and it is one which, at least in principle, we might be forced to give up as our study proceeds. Like Chisholm, I see such a failure, at the outset, as exceptionally unlikely. Nevertheless, as our theoretical investigation progresses, we could fail to find any real unity in the phenomenon we set out to study. We might, in short, come to the view that there really is no such phenomenon at all. Scientific studies sometimes come to an end in just this way. It is especially common in medicine, for example, to set out to investigate what one takes to be a certain disease or illness on the basis of a characteristic set of symptoms, only to find that there is no such underlying condition, but only some symptoms in a collection of cases with heterogeneous causes. What seemed like a genuine phenomenon, a fit object of theoretical investigation, turned out to lack the requisite theoretical unity. Were this sad end to be the case with knowledge or justified belief, we would be forced to a certain sort of skepticism: not the view that a well-defined phenomenon had, as it turns out, no actual instances, but instead, the conclusion that there was no well-defined phenomenon there in the first place.[[4]](#endnote-4) With Chisholm, however, I not only begin my study of justified belief with the optimistic view that this is unlikely to be the case; I also share his view, at the end of the day, that the phenomenon of justified belief is genuine, much as we disagree about the nature of that phenomenon.

In viewing justified belief as a phenomenon worthy of investigation, we are led to see the Arguments-On-Paper Thesis for the substantive empirical claim it is. If the Arguments-On-Paper Thesis is correct, then when we examine the phenomenon of justified belief, we should find that such beliefs are based on arguments of the sort elucidated in section I above: they are either ultimately based on premises which need no argument by way of good deductive and non-deductive arguments, or they are based on good deductive and non-deductive arguments which take as premises the entire body of our beliefs at an earlier moment. We have, at present, a well-developed account of the nature of good deductive argument, and there are various approaches available, both probabilistic and otherwise, to an account of the goodness of non-deductive argument. Although there are some who hold that basing requires the self-conscious endorsement of the arguments at issue (see, e.g., BonJour, 1986), others endorse a looser “taking” requirement on inference (Boghossian, 2014) or, more commonly, still weaker causal requirements. What all of these accounts entail, however, is that the logic of good argument be reflected in our belief acquisition and revision. The Arguments-On-Paper which define good argumentation must, in short, be psychologically real. While many epistemologists who have defended versions of the Arguments-On-Paper Thesis have been attracted to it because they viewed it as a way of depsychologizing epistemology,[[5]](#endnote-5) viewing justified belief as a phenomenon for theoretical investigation forces defenders of that Thesis to come to terms with its psychological implications.

III

I don’t mean to suggest that the psychological implications of the Arguments-On-Paper Thesis are pretheoretically implausible. Indeed, I think that quite the opposite is true. The suggestion that our justified beliefs are, in fact, psychologically based on good argumentation, where good argumentation is defined by some combination of deductive logic, inductive logic, inference to the best explanation, and/or the kinds of probabilistic transitions elaborated upon by formal epistemologists, has not only informed a variety of research programs in epistemology since Aristotle; it has done so precisely because this suggestion is so attractive on its face.

This approach not only provides a satisfying unification of various formal studies in logic broadly conceived with the normative issues addressed by epistemologists; it also makes sense of a good deal of our normative practice of giving and asking for reasons.[[6]](#endnote-6) Someone who makes a surprising claim will likely find that others press a demand for reasons: What makes you think that? The challenge can be met, of course, by argumentation, but those who cannot respond satisfactorily will not only be pressed to withdraw their claim; they will feel the force of the demand for reasons and, if finally unable to provide a satisfactory argumentative defense, will come, at least typically, to give up their belief. The Arguments-On-Paper Thesis provides a straightforward explanation of this practice. Those whose beliefs are justified will have at their disposal a good argument in favor of their beliefs. If we come to realize that we have no such argument, we are thereby shown that our belief was not justified, and we will therefore give it up. The readiness with which we are able to provide such arguments when challenged, and the readiness to give up our beliefs when we fail to meet the challenge, jointly serve to provide an exceptionally attractive line of support for the Arguments-On-Paper Thesis. The psychological and sociological implications of the Thesis thus should not be ignored, nor should they be seen as a source of embarrassment. These implications should, instead, be embraced by those who subscribe to the Arguments-On-Paper Thesis for they provide a crucial source of its support.

Additional support may be garnered from psychological research, and this support comes, it seems, in two different forms: investigation of our logical capacities, and a very general account, implicit in much research in the cognitive sciences, of how cognition is possible.

There has been a good deal of research on the logical capacities of human beings, even apart from any special training in logic. One research program has it that there are substantial such capacities, and that these capacities play a central role in cognition. Lance Rips (1994) has been a leader in such research, and he has argued that we not only show a striking sensitivity to deductive relations among our beliefs, but that we regularly engage in valid deductive inference. Those who have taught an introductory logic course may approach this work with a good deal of skepticism. How could it be that the very same individuals who regularly show great difficulty in learning the basics of deductive logic, and who regularly make a wide range of errors when confronted with basic deductive problem sets, should nevertheless be credited with substantial deductive capacities and viewed as regularly making use of them?

The work of such mental logicians as Rips are not so easily discredited. The first point to make is that it is one thing to be sensitive to deductive relations among beliefs and to regularly engage in valid deductive reasoning. It is quite another to be able to articulate valid principles of deductive logic and to manipulate a formal system. No one denies, for example, that human beings are sensitive to all manner of perceptual constancies in their environment and that these capacities play a central role in the production of perceptual belief. But allowing that there are such sensitivities in no way commits one to the absurd view that ordinary perceivers are in any position to articulate what these perceptual constancies are. The position of the mental logicians is that our sensitivity to logical relations among beliefs is very much like our sensitivity to perceptual constancies. These capacities play a central role in governing belief acquisition and revision without our having explicit beliefs about them.

But what should we say about the errors that our students make in courses on formal logic? How is this supposed to be compatible with the existence of a mental logic guiding our reasoning? Here, as elsewhere in cognitive science, it is necessary to appeal to a competence/performance distinction. The suggestion that we have a substantial deductive competence is fully compatible with the existence of performance errors. Just as the supposition of a grammatical competence is compatible with a wide range of errors in the production of speech, the existence of a deductive competence is equally compatible with a wide range of errors in deductive reasoning. The competence/performance distinction does not provide the mental logicians with a get out of jail free card, permitting them to simply ignore all evidence of deductive malfeasance and chalk them up, on every occasion, to factors interfering with a perfect underlying deductive competence. Nor do mental logicians treat it in this way. There are sensitive issues here about how best to explain the patterns of good and bad reasoning which we see in ordinary cognizers. My point is simply that there is an active research program ongoing which may serve to provide aid and comfort to defenders of the Arguments-On-Paper Thesis.

Just how much deductive competence is to be credited to ordinary cognizers thus remains to be settled, but even the most ambitious and optimistic researchers in this area have not claimed to find evidence of a full inductive logic of the sort needed to fund the Arguments-On-Paper Thesis. The work of the mental logicians needs to be extended and developed a good deal for a full-fledged empirical defense of the Arguments-On-Paper Thesis to be within reach. The work of the mental logicians, however, provides a non-trivial start on such a defense.

Further grounds for optimism on this score may be thought to be found in very general considerations about how cognition is possible. What I have in mind here is the kind of approach championed by Jerry Fodor (1975; 2008) in support of the language of thought hypothesis. Fodor argues that implicit in an extraordinarily wide range of research in the cognitive sciences is a commitment to viewing cognition as computation over sentences in a language of thought. This hypothesis requires that such computation is sensitive to syntactic features of our mental representations, and what this comes to is nothing more nor less than the postulation of the very sort of mental logic required to fund the Arguments-On-Paper Thesis. Our mental mechanisms, on this view, are sensitive to logical relations among our mental representations, and our inferences are thus simply a matter of drawing out relevant consequences, both deductive and non-deductive, of new information provided by our input systems together with the great fund of information which is stored in memory. If Fodor is right that such a view is implicit in virtually all research in the cognitive sciences, then there is very substantial ground for optimism about an empirical defense of the Arguments-On-Paper Thesis.

There is, however, a fly in the ointment. Fodor distinguishes between the operation of input systems, which, he argues, are modular, and the operation of central cognitive processes, which are not. Modular systems are able to work as smoothly and efficiently as they do precisely because they do not have access to the large body of information stored in memory. They don’t need to have access to such information in order to perform the work that they do. This simplifies the cognitive task which input systems are required to perform, and it makes our task of understanding how it is that they perform these tasks that much easier. As Fodor argues, we know a great deal about input systems.

Central cognitive processes, however, are another matter entirely. Such processes can only do their appointed job by drawing extensively on information stored in memory. These processes are global, and this makes their computational task that much more difficult, and, consequently, that much more difficult for us to understand. Accordingly, Fodor is led to endorse what he calls Fodor’s First Law of the Nonexistence of Cognitive Science: “the more global…a cognitive process is, the less anybody understands it.” (Fodor, 1983, p. 107)

The problem is, I believe, even more severe than Fodor makes it out to be. The kinds of global computational processes which Fodor claims are performed in central processing are ones which directly raise problems of computational complexity.[[7]](#endnote-7) Such processes are not difficult to understand; they simply cannot actually exist. Indeed, it is Fodor’s language of thought hypothesis which raises this very problem. While one might seek to circumvent the problem of computational complexity by arguing that global processes should be understood in non-computational terms, explained, perhaps, by the operation of lower level non-computational processes, Fodor insists that all of cognition is to be explained by syntactic operations over representations in the language of thought, and, at the same time, that such operations must operate globally rather than locally. Problems of computational complexity demonstrate, however, that global computational processes of this sort cannot be carried out in real time.

The kind of support for the Arguments-On-Paper Thesis which is implicit in Fodor’s work, then, proves to be illusory. If the Arguments-On-Paper Thesis is to obtain empirical support, it will need to come from further developments in the work of the mental logicians.

Let me summarize the argument of this section and its predecessor. The Arguments-On-Paper Thesis may seem, at first glance, to be innocuous. The identification of propositional justification with good argumentation seems quite trivial and undeniable. But if we are to understand doxastic justification in the usual manner, as belief which is propositionally justified and held on the basis of an argument which propositionally justifies it, and if we are to endorse, in addition, a robust anti-skepticism, then the Arguments-On-Paper Thesis commits us to a substantial empirical claim: that the great majority of our beliefs—the body of our justified beliefs—are held on the basis of good arguments. I have urged that we need to take this empirical commitment seriously. This section has explored some of the ways in which one might try to make good on that empirical commitment.

IV

There is, however, very strong reason, I believe, to think that the Arguments-On-Paper Thesis is false: justified belief is not the product of mental mechanisms governed by logical form. The best way to make the case against the Arguments-On-Paper Thesis, however, is not to provide a direct argument against it. What is needed instead is a different picture of how belief acquisition and revision might work. I provide a sketch of such an account here.

No one thinks that our perceptual systems work by taking sensory input and then constructing arguments for the existence of physical objects, however subconsciously, which would work equally well in any logically possible environment.[[8]](#endnote-8) This is not because inferential accounts of the uptake of perceptual information are universally rejected. Quite the opposite is true: inferential accounts of the workings of our perceptual systems have been exceptionally common at least since Helmholtz. Rather, the perceptual systems could not possibly function effectively without, in effect, making very substantial presuppositions about the nature of the environment in which they operate.

The environment in which we live contains, to a first approximation, three dimensional objects with fairly stable boundaries which move through space in predictable ways. The task of our perceptual systems is to recover information about such objects on the basis of the input which our senses provide. Consider, for example, what that input involves in a fairly simple case of visual perception: someone tosses a book to me from a short distance away, and I catch it. The book is, very roughly, a rectangular solid. If I am presented with the book at eye level and straight on, my visual system takes in an image of the book which is rectangular. If the book moves so that its lower edge comes somewhat closer to me than its upper edge, but it does not rotate on either of its other axes, then the visual image which my senses pick up is not rectangular, but trapezoidal. If the book rotates along its other axes as well, the visual image may be of an irregular quadrilateral. And if the book is presented to me on its edge, and it is thin enough, the image will approximate a line. Now if the visual system did not make any presuppositions about the environment in which it operates, nothing whatsoever about the book could be extracted from this continuously changing array of shapes. If, for example, the visual system did not take for granted that external objects are three dimensional, rather than two dimensional, or ten dimensional, the task of extracting information about shape would become impossible. If the environment were one in which objects might pop in and out of existence, or constantly change shape as they move, then the sensory input which the visual system provides would be compatible with infinitely many different possibilities, and there would be no reason whatsoever for favoring any one of these over the others. The visual system is able to do its work, providing roughly accurate information about the shape of physical objects in our environment because it is preloaded with very substantial assumptions about that environment, assumptions—such as that physical objects are three dimensional and that they tend to maintain their shape as they move, and that they don’t pop in and out of existence—which are typically true in the environments in which we operate. These assumptions constrain the range of possibilities in ways sufficient to allow for the pickup of information about the shape of physical objects. Our perceptual systems would not work in just any logically possible environment, for no information processing system could do that. Perception is possible only because the perceptual systems make presuppositions which are at least approximately true in typical environments in which we live. These presuppositions work below the level of conscious thought and are not available to introspection.

The fact that our perceptual systems work in this way leads to a characteristic pattern of errors—the perceptual illusions—when we are in non-standard environments. The straight stick partially submerged in water looks bent, and even when we are familiar with the illusion, it still looks bent. We can compensate for the illusory appearance once we become aware of this fact; what we can’t do is make the illusion go away.

The Arguments-On-Paper Thesis is committed to the view that our reasoning does not work in a similar way. Deductive arguments take us from true premises to true conclusions not just in the environment in which we live, or environments which bear deep similarities to it, but in all logically possible environments. And those who have hankered after an inductive logic have sought to develop formal systems which, even if they don’t, and, of course, can’t assure true conclusions from true premises, will produce conclusions from such premises which, in some important sense, are likely to be true, not only in our environment, but in any environment that has sufficient structure in it to allow for the reliable pickup of information. Thus, for example, what makes statistical reasoning of a certain sort good reasoning, it will be said, is not any feature of the actual world, or worlds roughly similar to it; what makes statistical reasoning good reasoning makes it good reasoning no matter what the environment is like.

What I want to suggest is that, contrary to the assumptions of the Arguments-On-Paper Thesis, much of human inference should be viewed in a way which parallels the structure of the perceptual systems: we make inferences which achieve their great successes in delivering reliable information about our environment precisely because inference works in ways which make substantive presuppositions about that environment, presuppositions which are not learned, but are built in to our inferential system in a way unavailable to introspection, and which are at least approximately true of the typical environments in which we live. Our inferences thus would not work well in just any logically possible environment, or any such environment in which it is possible to extract information. They work well because they are adapted to contingent but pervasive features of typical environments in which we are found, and they exploit assumptions about those features to allow for the efficient and reliable uptake of information.

Let me provide an illustration of how this can work. Statisticians speak of the Law of Large Numbers, the fact that the larger a sample, the more likely it is to reflect features of the population from which it is drawn. Famously, Tversky and Kahenman (1971) found that human inductive inference seems to obey a different law.

The law of large numbers guarantees that very large samples will indeed be highly representative of the population from which they are drawn… People’s intuitions about random sampling appear to satisfy the law of small numbers, which asserts that the law of large numbers applies to small numbers as well. (1971, p. 25 in reprint)

As Tversky and Kahneman argued, this represents a “sin[] against the logic of statistical inference…”. (1971, 31 in reprint) In what seemed to be an analogy with visual illusions, they described this as a “cognitive or perceptual bias.” (1971, p. 31 in reprint) But if this is truly analogous to the visual illusions, our errors should be seen as a biproduct of a process which works quite reliably in normal environments, producing errors when it operates outside them.[[9]](#endnote-9) More importantly, the analogy with visual perception, if it holds up, would suggest that this inferential tendency should not be viewed as any sort of cognitive impropriety, but as a cognitive strategy well adapted to the environments in which it tends to operate. So the question for us here is whether these inferences should be viewed as ones which make a presupposition about normal environments that both explains why we get things right when environmental conditions are normal, and produces a characteristic pattern of errors outside of normal conditions. And that is precisely, I believe, what we see.

It would, of course, be a serious cognitive error if, on noticing that one of the coins in my pocket is a penny, I concluded that all of the coins in my pocket are pennies. Other inferences from small samples are far less problematic. If I notice that a particular piece of copper conducts electricity and conclude that all copper conducts electricity, or if I notice that a particular sample of alcohol freezes at a certain temperature and conclude that all alcohol freezes at that temperature, I will not be led astray. Natural kinds have a sort of uniformity that random collections, such as the coins in my pocket, tend to lack. If our tendency to make inductive inferences from small samples is, by and large, applied to natural kinds, and if it is brought to bear on the sorts of properties of those kinds which are essential to them, then inferences in accord with the law of small numbers will be fairly reliable, although they will lead us into error when they are applied outside of the range to which they are adapted.

In order to make the case that this is, indeed, what one finds, one needs to show that we do not just apply the law of small numbers indiscriminately. For example, the inference about the coins in my pocket is not remotely compelling psychologically, even if other applications of the law of small numbers are. In addition, one must show that the manner in which kinds are conceptualized by us accords a special place to natural kinds.[[10]](#endnote-10) And one must show, in addition, that the properties which we tend to project in the case of natural kinds are ones which have the requisite degree of regularity in the population.[[11]](#endnote-11) With all of these pieces of the puzzle in place, however, a strong case emerges that inductive inference operates in us in a way that is structurally similar to the manner in which perception works. (Kornblith, 1993)

Just as in the perceptual case, the suggestion here is not that ordinary cognizers know relevant premises, either about objects in space, in the perceptual case, or about natural kinds, in the case of inductive inference, to make our inferences track the kinds of argumentation which defenders of the Arguments-On-Paper Thesis attribute to us. Rather, the suggestion is that we should be seen as having certain inferential tendencies which track deep regularities in our normal environments which serve to make our inferences reliable, even though the facts which makes those inferential tendencies reliable need not be known, and typically are not known, by ordinary cognizers. A creature which had an innate tendency to conclude that fire is present whenever it sees smoke would be quite reliable, even though it needed no evidence that smoke and fire are typically found together before it made that inference. Such a creature would not have inferences which track good argumentation, but it would be extremely reliable nonetheless. The suggestion here is that inductive inference works in us in much the same way.[[12]](#endnote-12)

A realistic picture of how human inference works, then, does not support the empirical claims needed for a defense of the Arguments-On-Paper Thesis. Successful human inference, or justified belief, or rational belief, just doesn’t work that way.

V

If all of this is right, why has the Arguments-On-Paper Thesis seemed so attractive? Why is it that, pre-theoretically, the Thesis seems so obviously true? There are, I believe, two different factors which combine to explain this.

We sometimes stop to reflect on what we believe in order to evaluate whether we should continue to hold some particular belief or, instead, give it up. We may wonder whether we have been hasty in forming a belief, or whether we have engaged in a bit of wishful thinking, or, in some other mood, whether we have formed some belief out of protective pessimism or some other sort of bias. When we do this, we attempt to determine the reasons for which we hold the belief in question and assess whether those reasons are good reasons. When we introspect in this way, it is quite common to have the very vivid impression that we can just directly detect the mental process by which we formed the belief we seek to evaluate; we just know, in short, why we believe as we do. But there is reason to believe that this vivid impression is an illusion. We do not have direct access to our mental processes. Instead, what seems to be the direct apprehension of our reasons for belief is the product of after-the-fact rational reconstruction: although introspection does not reveal this, we are engaging in subconscious inference to an explanation, devising an account of why it is we believe as we do. Such after-the-fact rationalization, or confabulation, need not be inaccurate. But the manner in which this inference proceeds makes it quite unlikely, in a wide range of circumstances, that we should detect any inferential errors we might have been making. In effect, our subconscious reconstruction of our mental process of belief acquisition makes use of a crucial minor premise: I’m a reasonable person, and if I believe this, I must have had good reasons. When we reconstruct our reasons, then, the reasons we find are typically reasons which appear to support the belief we seek to evaluate. The result is that the process of reflection which we undertook in order to provide some additional check on our belief is, unbeknownst to us, performed in a way which is likely to make us more confident of the belief we antecedently held, whether it was in fact formed on the basis of good reasons or not. (Nisbett and Wilson, 1977; Wilson, 2002; for discussion, see Kornblith, 2002, chapter 4, and 2012, chapter 1)

In effect, then, the process of reflection provides us with a convincing argument for our beliefs, whether those beliefs were held on the basis of such arguments or not. Reflection thus gives us the illusion that belief acquisition conforms to the Arguments-On-Paper Thesis. The manner in which our beliefs are actually formed, however, is quite different than it seems from the first-person perspective. The actual processes of belief acquisition and revision need not track anything that answers to good argument at all.

This is not to say that we are typically unreliable in believing as we do. We are, indeed, often very reliable. Our reliability, however, is not achieved in the way it seems to be when we stop to reflect. Reliable belief acquisition and revision frequently work, like the perceptual systems, by way of processes which exploit certain deep but contingent regularities in the environments in which we are typically found. These regularities are not ones we are mindful of; they are not known to most believers, nor need they be. When we stop to theorize about the nature of reasonable belief, however, if we simply engage in reflection on our beliefs rather than examine the experimental evidence about how our beliefs are actually formed, the Arguments-On-Paper Thesis will seem obviously true.

There is, however, another reason why the Arguments-On-Paper Thesis has appeared so attractive, and here, I believe, there is an important grain of truth to be found in the ideas which serve to support the Thesis. The Arguments-On-Paper Thesis presents our justified beliefs as the product of arguments licensed by rules of inference which do the good epistemic work they do in ways that would be equally epistemically good in any logically possible environment. I have argued that just as our perceptual processes work in ways which are adapted to contingent features of our environment, rational inferences producing justified beliefs may be similarly adapted to such deep but contingent features of environments we regularly inhabit. This does not make our capacity to arrive at true beliefs a matter of luck. It is not as if any slight change in our circumstance would have our belief-producing processes misfire, producing horribly mistaken beliefs. The features of our environments to which these processes are adapted provide those processes with a good deal of modal robustness. They work well, tending to produce true beliefs, in a wide range of counterfactual circumstances. They would not, however, work well throughout all of logical space; they would not work well in just any logically possible environment.

One may reasonably wonder, however, whether all of our inferential tendencies could possibly be of this sort. Even if not all of our justified beliefs are produced in ways which conform to the standards of the Arguments-On-Paper Thesis, the idea that none of our inferences are of that sort does seem especially implausible. We are capable, quite clearly, of drawing out at least some of the logical consequences of things we believe. It is hard to imagine how a system of nothing but merely ecologically adapted inference could provide us with this capacity. Moreover, it is for this reason that even those who reject the Arguments-On-Paper Thesis, as I do, should not be surprised that the research of the mental logicians has seemed to uncover some basic logical capacities operating within the human mind. Defenders of the Arguments-On-Paper Thesis are right, I believe, in thinking that it is overwhelmingly plausible that we have some such logical capacities. It is one thing to think, however, that such logical capacities inform some of our inferential behavior; it is quite another to think, as defenders of the Arguments-On-Paper Thesis do, that all of our justified beliefs are the product of inferences which are more than just ecologically valid, and would do good epistemic work across all of logical space. It is only this latter Thesis which I have been arguing against.

VI

What has all of this to do with whether we should see propositional or doxastic justification as the more fundamental notion? A great deal, I believe.

The standard way of viewing the distinction between propositional and doxastic justification has it that propositional justification is the more basic notion: a proposition is propositionally justified if one has good reason to believe it; a proposition is doxastically justified if one has propositional justification for it and one believes it on the basis of that justification. (See, e.g., Firth 1978; Conee and Feldman 2004) This way of viewing things encourages one to view the issue of propositional justification in ways independent of the psychological issues that inevitably arise in considering questions about basing. And once one thinks about propositional justification in this apsychological manner, the assimilation of questions about justification to questions about good argument that defines the Arguments-On-Paper Thesis looks utterly natural.

More than this, such a view comports well with a very traditional notion of the nature of philosophy itself. On this view, philosophical questions are to be addressed by a priori means, and the nature of epistemic justification, when viewed in this way, will inevitably involve principles of inference which do their good epistemic work across all of logical space. Epistemology, and philosophy generally, on this view, do not deal in the sort of merely contingent truths uncovered by an investigation of human psychology.

In addition, if one views one of the most fundamental tasks of a theory of justified belief to involve providing an answer to the skeptic, as traditional epistemologists tend to do, then the epistemic principles which define propositionally justified belief must have this a priori status in order to be able to play their skeptic-fighting role: anything less than this merely begs the question against the skeptic, on this view. So taking propositional justification as the more fundamental notion comports well with traditional views about the purity of philosophy as an a priori discipline.

If instead we begin thinking about the notion of justification by thinking about doxastically justified belief, the question of what our beliefs are actually based upon is immediately brought to center stage, with all of the psychological complications that entails. The rich phenomenon of justified belief may now be seen as one which does not answer to our pretheoretical conceptions of how our epistemic successes are achieved. And this, in turn forces us to give a psychologized account of propositional justification: a proposition is propositionally justified for a person just in case that person has available psychological processes which could reliably produce belief in that proposition absent any additional sensory input. (See Goldman, 1979; Kornblith, 2017, 2020) The key to understanding the phenomenon of justified belief, as I see it, thus lies in taking the notion of doxastic justification to be the more fundamental notion.

VII

I have argued that the question of whether we should view propositional or doxastic justification as the more fundamental notion is tied up with questions about the very nature of philosophy itself: whether philosophy is an a priori discipline, and the extent to which psychological questions enter in to epistemological theorizing. I have defended a naturalistic picture of the epistemological enterprise according to which the notions of both doxastically justified belief and propositionally justified belief as well are defined in frankly psychological terms. Finally, I have argued that this picture has implications for the normative status of logic.[[13]](#endnote-13)

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NOTES

1. I provided a defense of these claims in my 2017 and 2020. This paper further develops the arguments of those papers, arguments which are deeply indebted to Goldman (1979). Gilbert Harman (1970) argued early on that the laws of logic have nothing to do with a theory of inference. These ideas are developed in important ways by Malmgren (manuscript) and Talbott (manuscript). [↑](#endnote-ref-1)
2. Richard Foley (2012) and Paul Silva (2015) have offered interesting and important arguments against the basing requirement on doxastic justification, but this is definitely a minority view. Unfortunately, I cannot engage with these arguments here because they would take me too far afield from the concerns of this paper, but see Oliveira 2015 for discussion. [↑](#endnote-ref-2)
3. The points of this paragraph are, of course, due to Harman (1970). See also Quilty-Dunn and Mandelbaum (2018). [↑](#endnote-ref-3)
4. This skeptical conclusion is exactly the way Michael Williams (1977) views the matter in rejecting what he revealing terms “epistemological realism.” [↑](#endnote-ref-4)
5. For an extremely interesting discussion of the history of the debate about psychologism in the German-speaking world during the late nineteenth and early twentieth centuries, see Kusch (1995). [↑](#endnote-ref-5)
6. The line of thinking in this paragraph has been forcefully pressed by Brandom (2000), especially chapter 3; Kaplan (1985); Leite (2004); and Williams (1996), among others. [↑](#endnote-ref-6)
7. On this point, see Cherniak (1986); Harman (1986, pp. 25-7); Kornblith (1989); and Mole (2016). [↑](#endnote-ref-7)
8. Or, more cautiously, any logically possible environment with enough constancies in it to allow, in principle, for the reliable uptake of information. I will not add this qualification in the text in the remainder of the paper, but it should be understood throughout. [↑](#endnote-ref-8)
9. For an exceptional useful discussion of good versus bad biases, see Antony (1993). [↑](#endnote-ref-9)
10. On this point, see especially Gelman (2003). [↑](#endnote-ref-10)
11. On this point, see especially Billman and Heit (1988). [↑](#endnote-ref-11)
12. A similar picture is presented in Gigerenzer et al. (1999). [↑](#endnote-ref-12)
13. Thanks to Jonathan Kvanvig and Luis Oliveira for comments on a draft of this paper. [↑](#endnote-ref-13)