

THE PHILOSOPHICAL FOUNDATIONS OF RISK

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In his recent book *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management*, Nicholas Rescher advances the claim that "... at bottom risk is an ontological not an epistemological category ..."¹ Rescher's attempt to state a foundation for the concept of risk marks an important departure in the literature on risk. Most recent philosophical literature on risk is in the tradition of decision theory and, in particular, the utility analysis of choice; but the axioms of decision theory do not provide adequate philosophical support for the standard concept of risk applied by risk analysts. Rescher's account provides philosophical underpinnings for that concept, but there are powerful reasons for holding that risk is a function of judgments, hence fundamentally epistemological. The foundational ambivalence of the concept of risk is owed to the fact that attempts to measure and control risk generally aim at events *per se* rather than events as known. Nevertheless, the categorization of events in terms of risk presupposes epistemological considerations. A demonstration of the intrinsically epistemological nature of risk depends, however, on recognizing the importance of Rescher's contribution to our understanding of the problem of risk.

Rescher's View and the Tradition

Of course, any resolution of the question whether risk is "at bottom" epistemological or ontological will depend upon what one means by 'epistemology' and 'ontology', and where precisely one takes the bottom to be found. Rescher categorizes risk as ontological in the context of making a very useful and insightful distinction between taking a risk and running a risk. Rescher finds three elements in risk-taking:

- (1) *Choice of action*: deliberately doing certain things toward the production or avoidance of results.
- (2) *Negativity of outcome*: what ever harm, loss, unpleasantness, or misfortune that can eventuate.

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(3) *Chance of realization*: the specific prospect (possibility or probability) of realizing the unfortunate result at issue.²

Rescher, however, distinguishes between the case in which one consciously selects a course of action (risk taking) and the case in which the possibility of negative outcome is not a decisive factor, (or perhaps not even recognized at all) in the deliberative process. In the latter case a risk is *run* without having been *taken*. Thus, Rescher concludes:

... since one can certainly *run or incur* a risk without explicitly *taking* it - that is, without recognizing let alone accepting it - it is in the final analysis factors (2) and (3) above (the elements of chance and negativity) that are crucial to *risk* as such.³

Rescher is not advancing a particularly revolutionary hypothesis in these remarks. In identifying risk with his (2) and (3), the elements of chance and negativity, and in taking these elements to be ontological in the sense that they are matters of how things stand in the world (rather than matters of how things stand in our judgments), Rescher is recapitulating Von Neumann and Morgenstern. As they described it, the application of game theory to economics rests on the assumption "... that imagined events can be combined with probabilities. And therefore the same must be assumed for the utilities attached to them - whatever they may be."⁴ The mathematical combination of utility and probability provides the basis for a theory of consumer choice in that it provides the clue for a methodologically objective description of decisions with uncertain outcomes. Von Neumann and Morgenstern argue that their mathematics relates to consumer behavior in just the way that addition relates to mass in physics.⁵ This suggestion might reasonably be interpreted to imply that the notions of probability and utility are metaphysically commensurate with the notion of mass; and that, going one step further, the theory of games is founded on ontological considerations regarding real things as they stand in the world. Von Neumann and Morgenstern scrupulously avoid such claims, and, interestingly, make little use of the word 'risk' as well. In a rare explicit reference to risk they define the term in a way consistent with Rescher's use. 'Risk' is a combination of probability and negative utility.⁶

The relative paucity of direct references to risk in Von Neumann and Morgenstern is significant, however, because it presages an important contrast between decision theory and risk analysis with regard to the nature of risk. As developed, for example, by Friedman and Savage, utility analysis identifies choices in which a given consequence *C* is available with probability *P* ($0 < P < 1$) as choices made under conditions of risk. Following Von Neumann and Morgenstern, the utility of the outcomes (and subsequently, the utility of the choice itself) is calculated by discounting the utility of *C* (i.e. $U(C)$) by *P*, so that the utility of the choice is a function of $P \times U(C)$ for all possible

outcomes of the choice. Choices in which outcomes are certain are simple functions of the utility of outcomes. Under this formulation, there is no reason why all the mutually exclusive possible outcomes might not be positive, in some sense. It may be, for example, that if Eudora signs up for a luxury pleasure cruise, she has a .1 probability of meeting the man of her dreams and a .9 probability of spending a relaxing week at sea. The Friedman and Savage utility analysis provides a method for calculating the utility of the cruise based upon the utility of the two outcomes, and would regard this as a choice involving risk, despite the fact that there is no reason to see either outcome as a losing one, or as involving negativity, in the sense described under (2) above. It is simply the probabilistic structure of the choice which determines that it is made "under risk."⁷

This formulation has led to a literature in decision theory which tries to assess whether some degree of disutility ought to be associated with the mere fact that a decision is made under risk, with the fact that $U(C)$ is available probabilistically, rather than with certainty. A decision maker is said to be *risk neutral* (or associates no disutility with choices made under conditions of risk) if he or she has no preference between utilities equal in total magnitude, when one is available with certainty, while the other is available with probability less than one. For example, a risk neutral decision maker has no preference between a sure \$1 and a .01 chance at \$100, since, assuming that \$100 has one hundred times the utility of \$1, the utility of these two outcomes is the same. A person with a bias against probabilistic outcomes is said to be *risk averse*; a decision maker may also be *risk preferring*. If one assumes risk neutrality (along with other standard axioms of decision theory) it becomes possible to generate a number of paradoxes, yet Savage, among others, has offered powerful reasons for rejecting risk aversion.⁸ It is important to bear in mind that all of these references to risk in association with the utility analysis of consumer choice need not presuppose the negativity assumption with regard to utility of outcomes (though they certainly do not preclude that the utility of outcomes might be negative, either, and most standard examples from gambling and insurance discuss choices with possible negative outcomes). If we take Friedman and Savage to be representative of the decision theoretic tradition, the theoretical apparatus of the utility analysis is designed to handle a class of choices exhibiting a particular (e.g. probabilistic) logical structure; there is no reason to restrict the theory to choices involving risk in the ordinary sense that we use when we take risk to involve the possibility of a losing outcome, or one involving negativity in Rescher's sense.

The more recent tradition of risk analysis is concerned with the identification, quantification, and assessment of risks, where risks are indeed defined as a combination of probability and negative utility, frequently involving issues of human health and safety. There are important ambiguities in this formulation, however, with regard to the

decision theoretic tradition. Reference to risk aversion frequently conflates the notion of disutility associated with probabilistically available outcomes with the negative utility of taking a loss. The utilities of winning and losing equal dollar amounts, for example, may not have the same absolute value. It may be worse (more negative utility) to lose \$100 than it is good (positive utility) to receive a gift of \$100. When this is so, it has nothing to do with risk aversion *per se*, but is instead a result of diminishing marginal utility. Nevertheless, when losing outcomes are available with probability P , the disparity in utilities for losing and winning are commonly referred to as "risk aversion".⁹ While it may appear that risk analysis is simply about the business of providing inputs on risk for the utility analysis of choices involving risk, there are, in fact, importantly different concepts of risk at work. In the recent tradition of risk analysis, risk implies a normative evaluation - risk is in some sense *bad* - which the positivistically inclined approach of Friedman and Savage had sought to avoid. The concepts of risk neutrality and risk aversion suffer in turn from this ambiguity.

A related ambiguity bears directly on the philosophical foundations of risk. As noted above, the utility analysis derived from Von Neumann and Morgenstern and developed by Friedman and Savage is sufficient to provide an axiomatic foundation of a concept of risk (call it risk_p) understood as a parameter on the set of choices, but insufficient to provide a definition for a formal object (call it risk_o) which could be understood as risk *per se*. Risk_o is, in the Von Neumann and Morgenstern text explicitly, merely a convenient way of referring to possible outcomes with negative utility; but this is insufficient as a formal definition, since the utilities and probabilities of outcomes are imported into the theory, rather than defined by it. The notion of risk_o could not be defined in a theory whose primary formal object is choice because, as Rescher points out, if risk_o is taken merely to be a combination of negative utility and probability, it is entirely possible for one to be at risk, to be exposed to the possibility of events with negative utility, without regard to whether one has made any conscious or even implicit choice to be so. Rescher avoids the terminology of the utility analysis of choice in giving his formulations (2) and (3) above, and he is correct to do so, for in taking risk to be an object of analysis (in terms of probability and negativity) one moves beyond the scope of risk_p. Risk_p may be understood as a well founded (though abstruse) formal parameter on choice about which a considerable decision theoretic literature exists. Risk_o is probably closer to the ordinary sense of 'risk.' A definitive empirical account of probability and negativity factors would certainly put a decision maker in a very strong position to make use of the utility analysis for choices involving risk_p; but the philosophical foundations for risk_o must be established independently.

Risk analysts have made several attempts at this, but frequently their characterizations are so heavily influenced by the situational features of

particular problems as to make them seem *ad hoc*. In one of the classic texts on risk, Mark R. Greene defines *objective risk* as "... the variation that occurs when actual losses differ from expected losses." *Subjective risk* is, "... the mental state of an individual who experiences uncertainty or doubt or worry as to the outcome of a given event."¹⁰ Greene's purpose is the theory of insurance, and his distinction captures the difference between the risk which an insurer *takes* when writing a series of similar policies, and the risk an insurer *exploits*, that is, the risk which leads a consumer to demand insurance in the first place. Risk analysts interested in the health and safety consequences of technology have offered a different set of distinctions. *Real risk* is the combination of probability and negative consequence which exists in the real world; *observed risk* is the measurement of that combination obtained by constructing a model of the real world; and *perceived risk* is the rough estimate of real risk made by an untrained member of the general public. This set of distinctions speaks effectively to confusions that arise in the use of risk analysis in public policy decision making. The risk analyst must distinguish the possibility of erroneous analysis (the difference between real and observed risk) from the erroneous judgments of the uninformed (the difference between real and perceived risk). It is suggested that perceived risks are often based upon sensationalistic and misleading news reports, rather than on consideration of the facts.¹¹ Note the differences between the policy oriented treatment of real risk and the insurance theory treatment of objective risk. Real risk is simply the computation of probable losses; objective risk is the potential for deviation from probable losses. As such, there is little in the way of systematic development for the philosophical foundation of risk, and Rescher's willingness to address this problem in the first chapter of his book represents an important contribution.

If the general sense of situational definitions of risk were developed with philosophical sophistication, risk *per se* would have a reified or transcendent status, determined by the probabilities and the consequences of events in the world. Opposed to risk *per se* one would expect to find a mental entity, the subjective percept of the transcendent object. This is exactly the sort of theory indicated by Rescher when he characterizes risk as "at bottom" an ontological category, owing to the fact that its defining factors, chance of realization and negativity of outcome, are objective matters which depend upon how things stand in the world. The distinction between taking and merely running a risk introduces the ground for a distinction between the mental and objective realms. Rescher's account of risk might be described as a *modal* theory where a risk is a possible world (or some possible state of the actual world).

Although initially plausible, Rescher's modal theory of risk suffers from three difficulties, all of which would lead one to conclude that risks may not be so readily characterized in terms of how things stand in the

world, but, in fact, depend upon judgment, upon seeing or knowing the world to be a particular way. The first two difficulties are internal to Rescher's own treatment of the issues in *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management*. The third objection is more systematically directed against any account which would divorce the foundations of risk from judgmental considerations.

Rescher's Internal Difficulties

If risk is to be "at bottom" ontological and a matter of how things stand in the world, then its principal elements, chance of realization and negativity of outcome, must also be matters of how things stand in the world. Rescher's own accounts of these two elements are unconvincing attempts to provide wholly ontological accounts of either. In both instances, the problems Rescher faces are longstanding philosophical issues about which much is written, much is theorized, but little is resolved. The specific difficulties of Rescher's position for both chance and negativity are discussed below, but no attempt is made to represent the extensive literature on these two problems.

Rescher's ontology has chance as a component of risk, rather than probability. A tradition of thought which can be traced to Frank Knight's pioneering text on risk and uncertainty distinguishes between chance - the genuinely random potential for change in the universe - and probability, which may simply be a conditional description or prediction that substitutes for complete description when knowledge of full causal conditions is incomplete.¹² Phenomena and behavior governed by probability are not necessarily governed by chance, in this sense. The objects in question may be perfectly determined by natural causes which either aren't or can't be known with specificity; but that doesn't mean they aren't there. Rescher states simply that ". . . probability is the measure of chance,"¹³ but while he is correct that probability can be used as an aggregate measure of events which, individually, are random or "un-caused", this will not do as a definition of probability. Many paradigm cases for illustrating probability are probably not cases of chance (understood metaphysically) at all. An ordinary die, for example, is a large object by the standards of physics, and the roll of a die could be predicted by Newtonian mechanics if one had an exhaustive description of angles, forces, surface dynamics and initial conditions. The use of probability as a measure of the outcome of rolling dice is not a measure of physically random behavior at all, but behavior which, even in ignorance of the micro-causes, can be anticipated with probability.

If probability is, as Rescher suggests, a measure, it is one which is equally adept at measuring lapses in knowledge and measuring genuine chance. For Rescher's characterization to succeed, risk must be found only in cases where chance, not lack of knowledge, gives rise to

probabilistic assessments of a state of affairs. This, however, is patently not the case. Rescher himself accepts the traditional triarchy of philosophical foundations for the probability calculus: classical theory, relative frequency, and subjective (or personal) probabilities. As Rescher notes, personal probabilities refer explicitly to judgments made by human beings and only indirectly to how things stand in the world. Subjective probabilities are crucial to risk analysis, however, because classical theory is often inapplicable and relative frequency data is often unavailable. Subjective probabilities, at least, seem poor candidates for ontological characterization. Rescher defines them as “. . . a measure of a person’s judgmental confidence in, or conviction of, the truth of some thesis.”¹⁴ This appears to be a measure of confidence rather than chance, and Rescher’s strategy for founding risk on an ontologically conceived “chance of realization” subsequently seems to be jeopardized.

Poor as the ontological foundation for chance may be, it is far worse for negativity. Rescher clarifies negativity as follows:

. . . there is no quantity pre-existing in the world simply waiting to be measured - no basis for a quantitative comparison located “in the very nature of the things themselves.” But this absence of objective predetermination does *not* mean that a subjective comparison cannot be *created*. . . . For the values . . . simply do not exist “out there” as an objectively given, independent reality waiting to be measured. The comparison of negativities is a personal reaction to the objective circumstances rather than an aspect of the circumstances themselves.¹⁵

Even for Rescher himself, then, negativity, the “badness” of risk is not ontological, at least not in the sense of “how things stand in the real world.” Negativity is the result of a judgment. It becomes available as an element of risk only on the condition that a state of affairs has been judged, perceived or conceived to be bad, at least relative to some other state of affairs.

Rescher is correct to acknowledge this, even though it costs him his ontological characterization. The failure to recognize the normative dimension in risk as it is conceived by risk analysis complicates the problem of acceptable risk enormously.¹⁶ Rescher, however, does not seem to be aware that his account of negativity fails to square with his account for the foundations of risk. This must, in part, be because there is a certain obviousness to the observation that one can be at risk whether one knows it or not; a subjective account of risk will simply not do at all. Yet risk is not *simply* a matter of how things stand in the world, either, for whether one is at risk depends partly on how one does or would evaluate events, should they transpire.

The Epistemic Dimension of Risk

In my view, the need to reflect one’s level of confidence probabilistically and the need to evaluate events constitute sufficient demonstration of the inadequacy of founding the concept of risk wholly on how things stand in the world. Rescher’s own accounts of

chance and of negativity do not appear to support his claim that risk is at bottom an ontological concept; but thoroughly ontological accounts of chance and negativity might still be possible. Would such a theory capture the important philosophical content in the concept of risk? One test for any philosophical theory of risk is to see how it stacks up against those cases in which we commonly say that we have affected the risks we face simply in virtue of what we know about a given situation. We say that we reduce the risk of buying a Mazda when we see that it is highly rated by *Consumer Reports*; we lessen the risk when we consult a doctor recommended by a friend; we increase the risk when we operate the new food processor before reading the instructions; and we decrease the risk of getting lost in Boston if we remember to bring a map. The way that these qualifying circumstances affect risk in each case seems to be by changing, not the world, but our state of knowledge; but there are important ambiguities in these common ways of speaking about risk.

Consider for a moment the fabular adventures of two agents, the judicious and deliberative Caspar and the impulsive and reckless Speedo. Caspar and Speedo independently decide to buy a Mazda. Caspar reads the repair records and test recommendations for many cars; Speedo is impressed by the Mazda salesman's style. In a sense, Caspar and Speedo have made the same choice (to buy a Mazda), but common sense would tell us that Speedo has run a greater risk to arrive at that choice. Next, Caspar and Speedo decide to have gall bladder operations. Caspar consults a friend, a nurse at the local hospital, who tells him that Dr. X has a fine reputation and has performed thousands of gall bladder operations. Speedo opens the phone book, closes his eyes and puts his finger on Dr. X's name. After the operation, Caspar and Speedo buy the same brand of food processor and a head of cabbage. Caspar sits down and reads the instructions, then performs the series of motions needed to turn the cabbage into cole slaw. Speedo tosses the instructions in the waste can unread, but nevertheless performs exactly the same series of motions. Then Caspar packs the cole slaw in his picnic basket along with a map and sets off to Boston Commons for a picnic lunch. The way to the Commons is well marked, and he arrives without consulting his map. Speedo also packs lunch and heads for the Commons, but he leaves his map in his other suit; since it turns out that the way is well marked, he arrives in good order. Caspar and Speedo meet in the Commons over cole slaw and begin to argue about the risks they have run.

CASPAR: Clearly, Speedo, you have run greater risks than I at every turn. My actions have shown greater foresight, and I have been more certain of the outcome.

SPEEDO: If indeed you did run lesser risks than I, Caspar, it was only because actions you took were objectively more likely to succeed (e.g. you remembered to put the map in your picnic basket, while I did not),

and not because you showed greater “foresight”. The only thing that affects the risks we have taken are actual motions we have performed (for risk is, at bottom, an ontological affair), and you must admit that our acts are remarkably similar. In fact, they might have been *exactly* similar; I almost grabbed that map to put it under my cole slaw - I wouldn’t want to stain my spiffy new Mazda - and if I had, our risks would have been exactly the same.

CASPAR: Ah! But you would not have done it for the right reasons. The judgments we make (or, in your case, fail to make) affect the probability of our success, you see. You would, I think, agree that you are a lucky fellow, while I am less lucky than prudent. The fact that your good fortune is due to luck, while mine is due to foresight, shows that you have run greater risks.

SPEEDO: Look, if it’s true that the differences you note are just differences in the probability of success, I will admit you run lesser risks. But that just strengthens my philosophical position, for it’s the different probabilities which make the risks different.

CASPAR: Let me try another approach. Your claim that we ran the same risks is based on the assumption that, in performing the same actions, we were exposed to the same probability of negative outcome. My claim that the risks were different is based on the suggestion that people who act like Speedo are far less likely to perform those actions which have a low probability of negative outcome in the first place; so that even when a person who acts like Speedo (as you clearly do) does happen to perform the sort of actions (against all odds) that people who act like Caspar perform, they run greater risks because they were more likely to have performed actions which had a much lower probability of success.

SPEEDO: I agree completely; and though you’ve convinced me that I ran higher risks, I think my philosophical point is proved.

CASPAR: Notice, now, that we differed originally over the population which would be used to establish the probability of success. Your original population was “people who perform a certain set of specific physical actions with respect to buying a car, getting surgery, making cole slaw, and getting to Boston.” We are both members of that population. My original point was to see that there were two different populations, “people who generally act like Speedo,” and “people who generally act like Caspar,” which were relevant to determining risk, and that it was just a happenstance event that you and I found ourselves together in the population “people who perform a certain set of specific physical actions, *etc.*” For my part, I will concede that your “physical action” reference point indeed establishes a population basis on which we could say that our risks were the same (though I find that to be a trivial and uninformative way to compute risk). My philosophical point was that there is always a population reference point implicit in claims about risk, and this population reference point is not a matter of

how things stand in the world, but of the judgments we make as to what is interesting or important about the relation between our actions and future events. Risks aren't things in the sense that they can be discovered and analyzed in the way that protons or wildebeast are; but once we have selected an otherwise arbitrary population of persons or actions, we can ask about the probability that certain outcomes will occur for people who act in that particular way (and this is a question that might be answerable in purely ontological terms). The prior question of which population to identify (or whether to define a risk at all), is determined by background beliefs about what sort of behaviors it is important to control. In fact, these background beliefs are culturally determined, but their metaphysical status is to be found in the broad system of judgments which allows us to function as social beings. Risk is, in that sense, epistemic: not that we can change probabilities through squinting our eyes and wishing hard, but that the very basis for identifying someone or some group as "at risk" presupposes standards for selecting the actions and events we want to quantify.

SPEEDO: Well, as a fictional character arguing against the position our creator wants to defend, I must defer to your superior argument.

Caspar's final position depends upon seeing risk as an amalgam of the social and natural sciences. As Max Weber wrote in his classic article on methodology in the social sciences, the natural and social sciences differ most fundamentally in their choice of objects for appropriate study. For the natural sciences there is a presumption that the objects of study, the tides, the plasmids, even the forces, have a character or structure of their own, and that it is the task of theory to describe. The phenomena of social theory are often easier to circumscribe precisely because the criteria for being an object of social theory are a reflection of the scientists' own interests (though, Weber claims, once the objects have been defined, social science can be as "objective" as natural science in its attempt to explain them).¹⁷ Hilary Putnam came to a similar conclusion in his book *Meaning and the Moral Sciences* when he concluded that the interest-relativity of explanation makes translation easier when one is referring to kinds and objects within the natural world because the world itself and the act of referring to it establish a structure for the semantics of natural language; but as one attempts to translate culturally dependent language, the common reference point of the natural world is no longer assured.¹⁸ Concepts which depend upon the "background" of meanings and uses are more difficult to translate and even to articulate than those which refer to things which stand in the world. Rescher's thesis that risk is ontological amounts to the claim that judgmental, background considerations should not figure importantly in the semantics of 'risk'; but Caspar's arguments above are intended to show that they do.

As noted above, one of the key accomplishments of Rescher's ontological approach is that it forms the basis for distinguishing between taking and running a risk, and this, in turn, serves the distinction between real and perceived risk which is crucial to risk analysis. Risk analysis is established on the presumption that the primary goal is to identify and predict natural events probabilistically; but the risk bearer's fears, concerns, and perceptions may have little influence over events which would be harmful to him, were they to occur. As such, the distinction between those factors bearing upon events and those factors bearing on perceptions is a methodological prerequisite to analysis. The adoption of this distinction, and the direction of analytic interest toward the prediction of events which are harmful represent the methodological parameters of the concept of risk for risk analysis. One might, however, understand risk in a way which, contrary to the real/perceived risk presumptions of risk analysis, would make it impossible to be wrong when one takes oneself to be at risk.

For example, consider the concept of risk which characterizes the situation of a decision maker operating under conditions of near total ignorance - the decision, perhaps, to buy a new video cassette recorder. Our subject (call him Hugh) reads the ads in the local paper, and shops several stores. What brand and model should he buy? What is the right choice? From Hugh's perspective, the ads and recommendations of salespeople do not constitute reliable information on video recorders because they are obviously intended to sell a particular model. Hugh asks a friend who says, "They're all pretty much alike." But Hugh thinks this friend may be a little flakey, so he doesn't trust his advice, either. Hugh's decision is less one of choosing from among an array of video cassette recorders than it is one of deciding what to believe. Notice that the choice of what to believe does not even determine his choice of video cassette recorders, since if he believes his flakey friend, he will still have to find some way to choose a specific model to purchase. From Hugh's perspective, the thing that makes this decision risky is the fact that he has no reliable source of information. Depending on his personality, Hugh can use one of several strategies to resolve the situation. He may seek more information, but if the world of electronics is genuinely foreign to him, this may only multiply his options of what to believe, rather than resolving them. He may use a fairly arbitrary factor, his experience with "Brand X" television sets to resolve his decision, and if he does, he might reasonably maintain that this is the best option available to him even if it does not lead him to buy the video cassette recorder which would be most satisfactory. It is the best option not because it has the best probable consequences, but because the factors influencing his decision framework at the time of choice led him to select that option. If a risk analyst were to tell him that, in fact, his flakey friend was right, all options are about the same and no choice he could make was any worse than any other, Hugh would be correct to insist

that, from his perspective, the claim that all options are equivalent could be nothing but a claim (and not a known fact). Hugh's own ignorance (about which he could not be mistaken) was the primary source of risk in his choice. His strategies of choice have to do with resolving the problem of total ignorance, and what is true in fact (the risk analyst's "real risk") is irrelevant to the risk in Hugh's decision. What has gone on here is that the appropriate focus of Hugh's interest in risk is his own lack of confidence in any claim about the world. The risk analyst's interest in probabilities and harms cannot resolve Hugh's dilemma, because the risk analyst's advice appears as just another claim about the world. Why should he now have confidence in that one above all others?

Risk, Risk Analysis, and Interest Relativity

Of course, there are reasons why Hugh should have confidence in the risk analyst's claim. Risk analysis competently done assembles the best available scientific evidence to establish the probability of events; but Hugh will be willing to countenance such a recommendation of risk analysis only if he has already accepted the validity of scientific methods and the general competence of those in our society who employ them. Lacking such confidence in science, Hugh has little incentive to accept the risk analyst's interest in objective evidence for probability and harm as defining the parameters for the problem of risk. Hugh might, for example, think that it is more important to leave all decisions made in total ignorance up to blind faith, and he may find God's hand at work in what would appear to be an arbitrary choice. Here we can see a contrast between the risk analyst's view that what is crucial to risk is the anticipation of probable consequences and a view which takes the problem of risk to be a test of the individual's willingness to surrender to supernatural powers. It is not my purpose here to suggest or hint in any way that one approach is just as good as any other, but I do want to claim that the nature of risk and the criteria for resolving problems of risk are amenable to radically different metaphysical interpretations. The philosophical argument which would be required to establish the superiority of one approach over another cannot, therefore, consist in sharpening the tools of measurement we use in referring to the probability of harmful events. An argument capable of establishing the probability and negativity approach to risk would be required to articulate and defend the nexus of background beliefs and meanings which support the scientific method itself.

This extension of the philosophical foundations of risk into those interest-relative forms of explanation which are the standard turf of social science is supported by Mary Douglas's work on the concept of risk. In a series of articles and the book *Risk and Culture* (co-authored with Aaron Wildavsky) Douglas develops the idea that the identification of risks and dangers is a key battleground in the power struggles

of a society. While it is, perhaps, obvious enough that disagreements over the risks of pollution, nuclear power, and other technological hazards have become deeply politicized, Douglas wants to ground the power struggle at a deeper cultural level. Douglas suggests that the concept of risk becomes a key token in a culture's self-understanding of its relation to nature. This self-understanding affects not only a society's standards for acts and events which are permissible (as opposed to those which violate natural limits), but is interwoven with the forms and methods of knowing which are to be acknowledged as legitimate access to the natural order. When the knowledge basis of society is challenged (whether that knowledge base be magic, religion, or scientific method) it will be through the delineation and cultivation of risks (more properly, concepts of risk) which the reigning paradigm is incapable of addressing.¹⁹

Douglas's anthropology might form the basis for a general philosophical theory of risk. A concept of risk is formed for an individual or group when background beliefs about power (for the scientifically inclined among us, this may simply be our beliefs about how actions and events become efficacious) coalesce with beliefs about fitness (or desirability). Once there is agreement about what is at stake and the general mechanisms available for exerting control, one can begin to talk about persons or groups of persons at risk, and one can begin to apply whatever canons of knowledge are appropriate to assess the various actions and states of affairs. Certainly, powerful reasons can be given for applying the analysis of chance and negativity. Because many risk analysts today are trained in engineering and the natural sciences, there may be a tendency to define populations at risk according to goals of quantification and natural science methodology, and to identify the risks which can subsequently be studied in great detail as "real" ones. This strategy is almost certainly the one to pursue in many cases, but its justification is not to be found in its reliance upon secure ontological categories, on being "real". Totally aside from its theoretical development, scientific thinking enters our background beliefs about what is to be feared and how it can be controlled. It is this judgmental contribution of science that shapes the contemporary categorization of risk and distinguishes it from animistic fears and taboos. In any case, seeing a situation as risky involves a categorical framing of a situation which is value laden, but that, once framed, can be analyzed and assessed "objectively," in Weber's sense.

What does all this mean for contemporary risk analysis? To the extent that risk analysis is committed to the general concept of nature as a sphere of things and events, existing independently of and largely unaffected by our attempts to know it, the categorization of risk in the terms of chance and negativity proposed by Rescher appears to be appropriate. To the extent that our culture remains committed to some version of the general metaphysical views that have enabled the rise of

science, this approach will enjoy credibility; but we can expect attacks (political and philosophical) upon the metaphysical traditions of science to involve the notion of risk in a fundamental way. Whether we should or should not remain committed to any metaphysical view is, of course, a general philosophical question of the broadest possible kind. My purpose here has simply been to demonstrate relevance of risk studies to the deepest questions of general philosophy.

NOTES

¹ Nicholas Rescher, *Risk: A Philosophical Introduction to the Theory of Risk Evaluation and Management*. (Washington D.C.: 1983, University Press of America), pp 6-7.

² *Ibid.*

³ *Ibid.*

⁴ John Von Neumann and Oskar Morgenstern, *Theory of Games and Economic Behavior*, (Princeton: 1944, Princeton University Press), p 20.

⁵ *Ibid.* pp 21-22.

⁶ *Ibid.* p 168.

⁷ Milton Friedman and L. J. Savage, "The Utility Analysis of Choices Involving Risk," *The Journal of Political Economy* Vol. 56 (1948) pp 279-304.

⁸ cf. Leonard J. Savage, *The Foundations of Statistics*, 2nd Revised Ed. (New York: 1974, Dover); also Maurice Allais and Ole Hagen, eds. *Expected Utility Analysis and the Allais Paradox*, (Dordrecht: 1979, Reidel); also Talbot Page and Douglas MacLean, "Risk Conservatism and the Circumstances of Utility Theory," *American Journal of Agricultural Economics* Vol. 65 (1983) pp 1021-1026.

⁹ Glenn Johnson, "Ethical Issues in Resource Economics: Discussion," *American Journal of Agricultural Economics* Vol. 65 (1983) pp 1033-1034.

¹⁰ Mark R. Greene, *Risk and Insurance*, 4th ed. (Cincinnati, OH: 1977, South-Western Publishing Co.), p 2.

¹¹ Chauncey Starr, Richard Rudman, and Chris Whipple, "The Philosophical Basis of Risk Analysis," *Annual Review of Energy I* (1976) pp 629-662.

¹² Frank H. Knight, *Risk, Uncertainty and Profit* (New York: 1921, Hart, Schaffner & Marx), pp 35-38.

¹³ Rescher, *Op. cit.* p 33.

¹⁴ *Ibid.* p 34.

¹⁵ *Ibid.* pp 26-27.

¹⁶ cf. Margaret N. Maxey, "Radiation Health Protection and Risk Assessment: Biological Considerations," *Perception of Risk*, (Washington, D.C.: 1980, National Council on Radiation Protection and Measurements); also K. S. Schrader-Frechette, "Environmental Impact Analysis and the Fallacy of Unfinished Business," *Environmental Ethics* Vol. 4, 1 (Spring 1982) pp 37-47.

¹⁷ Max Weber, "'Objectivity' in Social Science and Social Policy," *The Methodology of the Social Sciences*, (New York: 1949, The Free Press).

¹⁸ Hilary Putnam, *Meaning and the Moral Sciences*, (Boston: 1978, Routledge and Kegan Paul).

¹⁹ Mary Douglas and Aaron Wildavsky, *Risk and Culture*, (Berkeley, CA: 1982, University of California Press); also Mary Douglas, "Environments at Risk," *Implicit Meanings*, (Boston: 1976, Routledge and Kegan Paul).