

- Resolution. Directions for the 21st Century.* East Lansing: Michigan State Press, 1997.
- Marsh, Herbert W., Jennifer Barnes, and Gary E. Richards. "Positive and Negative Global Self-Esteem. A Substantively Meaningful Distinction or an Artifact." *Journal of Personality and Social Psychology* 51 (1986): 195-204.
- Martinez, Rueben and Richard L. Dukas. "Ethnic and Gender Differences in Self-Esteem." *Youth and Society* 22 (1991): 313-338.
- Pedhazur, Elezar J. *Multiple Regression in Behavioral Research: Explanation and Prediction.* Fort Worth: Hold, Rinehart and Winston, 1982.
- Pryor, John B., Janet L. Giedd, and Karen B. Williams. "A Social Psychological Model for Predicting Sexual Harassment." *Journal of Social Issues* 51 (1995): 69-84.
- Pugliesi, Karen, and Scott L. Shook. "Gender, Ethnicity, and Network Characteristics: Variation in Social Support Resources." *Sex Roles: A Journal of Research* 38 (1998): 215-238.
- Rogers, Jack E.. "A Community of Unequals: An Analysis of Dominant and Subdominant Culturally Linked Perceptions of Participation and Success within Intercollegiate Competitive Debate." *Contemporary Argumentation and Debate* 18 (1997): 1-22.
- Roloff, Michael E. *Interpersonal Communication: The Social Exchange Approach.* Beverly Hills, CA: Sage, 1981.
- Simerly Greg, and Brian McGee. "Sexual Harassment in Intercollegiate Debate III: Participants' Perceptions." Paper presented at the meeting of the Central States Speech Communication Association. New Orleans. November 1997.
- Stepp, Pamela., Greg Simerly, and Brenda Logue. "Sexual Harassment in CEDA Debate." *Argumentation and Advocacy* 31 (1994): 36-40.
- Stepp, Pamela. "Response to Beattie: A Word from the President of the Cross-Examination Debate Association." *STAM Journal* 26 (1996): 117-119.
- Szwapa, Cynthia A. "Sexual Harassment and Gender Discrimination in NDT Debate." *Argumentation and Advocacy* 31 (1994): 41-44.
- Wiener, Richard L. "Social Analytic Jurisprudence in Sexual Harassment Litigation: The Role of Social Framework and Social Fact." *Journal of Social Issues* 51 (1995): 167-180.
- Wilkins, Amanda M. and Jeffrey Hobbs. "The Prevalence of Patriarchy in Debate." *Contemporary Argumentation and Debate* 22 (1997): 34-56.

DEBUNKING MINI-MAX REASONING: THE LIMITS OF EXTENDED CAUSAL CHAINS IN CONTEST DEBATING

David M. Berube

To employ a mathematical analogy, we can say that although the risk of extinction may be fractional, the stake is, humanly speaking, infinite, and a fraction of infinity is still infinity.

— Jonathan Schell

The lifeblood of contemporary contest debating may be the extended argument. An extended argument is any argument requiring two or more distinct causal or correlational steps between initial data and ending claim. We find it associated with advantages to comparative advantage cases, with counterplan advantages, with disadvantages, permutation and impact turnarounds, some kritik implications, and even probabilistic topicality arguments. In practice, these often are not only extended arguments, they are causal arguments using mini-max reasoning. Mini-max reasoning is defined as an extended argument in which an infinitesimally probable event of high consequence is assumed to present a highly consequential risk. Such arguments, also known as low-probability high-consequence arguments, are commonly associated with "risk analysis." The opening statement from Schell represents a quintessential mini-max argument. Schell asked his readers to ignore probability assessment and focus exclusively on the impact of his claim. While Schell gave very specific reasons why probability is less important than impact in resolving this claim, his arguments are not impervious to rebuttal.

What was a knotty piece of evidence in the 1980s kick-started a practice in contest debating which currently is evident in the ubiquitous political capital disadvantage code-named "Clinton." Here is an example of the Clinton disadvantage. In theory, plan action causes some tradeoff (real or imaginary) that either increases or decreases the President's ability to execute a particular agenda. Debaters have argued the following: Clinton (soon to be Gore or Bush) needs to focus on foreign affairs. A recent agreement between Barak and Assad needs presidential stewardship. The affirmative plan shifts presidential focus to Nigeria that trades off with focus on the Middle East. As a result, the deal for the return of the Golan Heights to Syria fails. Violence and conflict ensues as Hizbollah terrorists launch

David M. Berube (Ph.D. New York University) is an Associate Professor of Speech Communication and Director of Debate at the University of South Carolina.

guerilla attacks into northern Israel from Lebanon. Israel strikes back. Hizbollah incursions increase. Chemical terrorism ensues and Israel attacks Hizbollah strongholds in southern Lebanon with tactical nuclear weapons. Iran launches chemical weapons against Tel Aviv. Iraq allies with Iran. The United States is drawn in. Superpower miscalculation results in all-out nuclear war culminating in a nuclear winter and the end of all life on the planet. This low-probability high-consequence event argument is an extended argument using mini-max reasoning.

The appeal of mini-max risk arguments has heightened with the onset of on-line text retrieval services and the World Wide Web, both of which allow debaters to search for particular words or word strings with relative ease. Extended arguments are fabricated by linking evidence in which a word or word string serves as the common denominator, much in the fashion of the sorities (stacked syllogism): $A\alpha B, B\alpha C, C\alpha D, \text{ therefore } A\alpha D$. Prior to computerized search engines, a contest debater's search for segments that could be woven together into an extended argument was incredibly time consuming.

The dead ends checked the authenticity of the extended claims by debunking especially fanciful hypotheses. Text retrieval services may have changed that. While text retrieval services include some refereed published materials, they also incorporate transcripts and wire releases that are less vigilantly checked for accuracy. The World Wide Web allows virtually anyone to set up a site and post anything at that site regardless of its veracity. Sophisticated super search engines, such as Savvy Search[®] help contest debaters track down particular words and phrases. Searches on text retrieval services such as Lexis-Nexis Universe[®] and Congressional Universe[®] locate words and word strings within n words of each other. Search results are collated and loomed into an extended argument. Often, evidence collected in this manner is linked together to reach a conclusion of nearly infinite impact, such as the ever-present specter of global thermonuclear war.

Furthermore, too much evidence from online text retrieval services is unqualified or under-qualified. Since anyone can post a web page and since transcripts and releases are seldom checked as factual, pseudo-experts abound and are at the core of the most egregious claims in extended arguments using mini-max reasoning.

In nearly every episode of fear mongering . . . people with fancy titles appeared. . . [F]or some species of scares . . . secondary scholars are standard fixtures. . . . Statements of alarm by newscasters and glorification of wannabe experts are two telltales tricks of the fear mongers' trade. . . . the use of poignant anecdotes in

place of scientific evidence, the christening of isolated incidents as trends, depictions of entire categories of people as innately dangerous. . . . (Glassner 206, 208)

Hence, any warrant by authority of this ilk further complicates probability estimates in extended arguments using mini-max reasoning. Often the link and internal link story is the machination of the debater making the claim rather than the sources cited in the linkage. The links in the chain may be claims with different, if not inconsistent, warrants. As a result, contextual considerations can be mostly moot.

Not only the information but also the way it is collated is suspect. All these engines use Boolean connectors (*and, or, and not*) and Boolean connectors are dubious by nature.

Boolean logic uses terms only to show relationships – of inclusion or exclusion – among the terms. It shows whether or not one drawer fits into another and ignores the question whether there is anything in the drawers. . . . The Boolean search shows the characteristic way that we put questions to the world of information. When we pose a question to the Boolean world, we use keywords, buzzwords, and thought bits to scan the vast store of knowledge. Keeping an abstract, cybernetic distance from the source of knowledge, we set up tiny funnels. . . . But even if we build our tunnels carefully, we still remain essentially tunnel dwellers. . . . Thinking itself happens only when we suspend the inner musings of the mind long enough to favor a momentary precision, and even then thinking belongs to musing as a subset of our creative mind. . . . The Boolean reader, on the contrary, knows in advance where the exits are, the on-ramps, and the well-marked rest stops. . . .

The pathways of thought, not to mention the logic of thoughts, disappear under a Boolean arrangement of freeways." (Heim 18, 22-25)

Heim worries that the Boolean search may encourage readers to link together nearly *empty* drawers of information, stifling imaginative, creative thinking and substituting *empty* ideas for *good reasons*. The problems worsen when researchers select word strings without reading its full context, a nearly universal practice among contest debaters. Using these computerized research services, debaters are easily able to build extended mini-max arguments ending in Armageddon.

Outsiders to contest debating have remarked simply that too many policy debate arguments end in all-out nuclear war: consequently, they categorize the activity as foolish. How many times have educators had contest debaters in a classroom discussion who strung

out an extended mini-max argument to the jeers and guffaws of their classmates? They cannot all be wrong. Frighteningly enough, most of us agree. We should not ignore Charles Richet's adage: "The stupid man is not the one who does not understand something – but the man who understands it well enough yet acts as if he didn't" (Tabori 6).

Regrettably, mini-max arguments are not the exclusive domain of contest debating. "Policies driven by the consideration of low risk probabilities will, on the whole, lead to low investment strategies to prevent a hazard from being realized or to mitigate the hazard's consequences. By comparison, policies driven by the consideration of high consequences, despite low probabilities, will lead to high levels of public investment" (Nehnevajsa 521). Regardless of their persuasiveness, Bashor and others have discovered that mini-max claims are not useful in resolving complex issues. For example, in his assessment of low-probability, potentially high-consequence events such as terrorist use of weapons of mass destruction, Bashor found simple estimates of potential losses added little to contingency planning. While adding little to policy analysis, extended arguments using mini-max reasoning remain powerful determinants of resource allocation. As such, they need to be debunked.

Experts agree. For example, Slovic advocates a better understanding of all risk analysis since it drives much of our public policy. "Whoever controls the definition of risk controls the rational solution to the problem at hand. If risk is defined one way, then one option will rise to the top as the most cost-effective or the safest or the best. If it is defined another way, perhaps incorporating qualitative characteristics or other contextual factors, one will likely get a different ordering of action solutions. Defining risk is thus an exercise in power" (699). When probability assessments are eliminated from risk calculi, as is the case in mini-max risk arguments, it is a political act, and all political acts need to be scrutinized with a critical lens.

This essay intends to examine some of the problems associated with extended arguments using mini-max reasoning. First, extended arguments will be examined in respect to logical problems associated with causality, corroboration, and equivocation. Second, mini-max reasoning will be examined in an attempt to debunk its persuasiveness. Finally, I will introduce three criteria for assessing the probative value of mini-max extended arguments.

The Limits of Extended Arguments

The strength of the relationship between the claims in extended arguments rests on the probability of the causation between and among the simple claims. The relationship between each claim in an extended argument is moderated by its probability. Probability is challenging to define. Many scientists and members of the risk assessment community "have not as yet come to grips with the foundational issue about the meaning of probability and the various interpretations that can be attached to the term *probability*. This is extremely important, for it is how one views probability that determines one attitude toward a statistical procedure" (Singpurwalla 182).

We employ the notion of probability when we do not know a thing with certainty. But our uncertainty is either purely subjective (we do not know what will take place, but someone else may know) or objective (no one knows, and no one can know). Subjective probability is a compass for an informational disability. . . . Probability is, so to speak, a cane for a blind man; he uses it to feel his way. If he could see, he would not need the cane, and if I knew which horse was the fastest, I would not need probability theory. (Lem 142)

In simple arguments, "risks are simply the product of probability and consequence" (Thompson & Parkinson 552). Thompson and Parkinson found a difficulty in risk assessment associated with mini-max arguments that they identified as the problem of *risk tails*. "Risk tails are the segments of the standard risk curve which approach the probability and consequence axes. The tails represent high-consequence low-probability risk and low-consequence high-probability risk" (552). This region, especially the high-consequence low-probability tail, is the site of mini-max computation.

The complex probabilities of extended arguments are problematic. For example, too much reliance is given an extended link story when each step in the link exhibits a probability that is geometrically self-effacing. According to the traditional multiplication theorem, if a story is drawn from $A\alpha B\beta C\gamma D$, the probabilities of $A\alpha B$ and $B\beta C$ and $C\gamma D$ are multiplied. "The probability that two subsequent events will both happen is a ratio compounded of the probability of the 1st, and the probability of the 2nd in the supposition the 1st happens" (Bayes 299). If the probability of $A\alpha B$ is .10 and the probability of $B\beta C$ is also .10, then the probability of $A\alpha C$ is .01. If the probability of $C\gamma D$ is also .10, then the probability of $A\alpha D$ is .001.

If all we had to do to determine probability involved multiplying fractions, calculating probabilities would be easy. Unfortunately, such is not the case. An interesting caveat involves conditional probability. "Its expositors hold that we should not concern ourselves with *absolute probabilities*, which have no relevance to things as they are, but with *conditional probabilities* – the chances that some event will occur when some set of previous conditions exists" (Krause 67). Conditional probabilities are most often associated with calculations involving variables that may be even remotely associated, such as phenomena in international relations.

If one considers the probability of many separate events occurring, one must also consider whether or not they are correlated – that is, whether or not they are truly independent. If they are correlated, simply multiplying individual probabilities will not give you the correct estimate, and the final probability may actually be much larger than one will predict if one makes this error. For example, the probability that I will utter an obscenity at any given instance may be small (although it is certainly not zero). The probability that I will hit my funny bone at any given instant is also small. However, the probability that I will hit my funny bone and then utter an obscenity is not equal to the product of the probabilities, since the probability of swearing at a given instant is correlated to the probability of hurting myself at a given instant. (Krause 67)

Hence, "if we calculate *a priori* the probability of the occurred event and the probability of an event composed of that one and a second one which is expected, the second probability divided by the first will be the probability of the event expected, drawn from the observed event" (Laplace 15).

Another complication of extended causal chains is the corroboration principle. "There are cases in which each testimony seems unreliable (i.e., has less than 0.5 probability) on its own, even though the combination of the two testimonies is rather persuasive. . . . [I]f both testimonies are genuinely independent and fully agree with one another, we are surely going to be inclined to accept them" (Cohen 72). When we are uncertain about a probability, we might try to engage multiple sources making the same or same-like claim. We feel it is less likely that two or more sources are incorrect than that a single source will be. While corroboration seems valid, it is a persuasive pipe-dream. If we use this calculus to draw our claims, errors are likely to be shared and replicated. Witness some of the problems associated with *realism* in international relations literature.

As such, the multiplication theorem has been subverted by conditional probabilities and undercut by corroboration, but contest debaters and policy makers have not risen to the challenge. While contest debating has borrowed heavily from policymaking and systems analysis, it has not resolved the causality issues any better than have policy studies experts. The grand calculus used in systems analysis is as simplistic as it is in contest debating. Lichtman and Rohrer described what happens to systems analysis in a contest debate two decades ago. "To determine the level of net benefits achieved by a policy system when multiple outcomes are considered, policy makers simply sum, for all anticipated results, the product of their probabilities and values" (238).

In contest debating, each critic will have her own threshold at which she is prepared to make a commitment. The critic tries to establish this threshold by examining the probabilities of the causal story in the argument. Zarefsky asserted that setting the threshold may be so challenging that most critics opt for rounding instead.

The only alternative to probabilistic analysis in argumentation is a rounding-off process that either reduces probability measures to zeros or elevates them to one (100%). . . . Yet whatever the threshold chosen by a decision maker may be, the practical result is still a rounding-off of probability to zero or one with consequent errors, in the assessment of policy. (Qtd in Lichtman and Rohrer 239)

Zarefsky's observation is intriguing. Consider how often critics have voided disadvantages following a uniqueness response. For example, in response to a Presidential leadership internal link story, a contest debater may claim that recent Presidential behavior makes the claim not unique. However, uniqueness is not a threshold issue, it is a linear one, a probabilistic one. While the response reduces the likelihood of the internal link story, uniqueness responses only reduce the probability of the internal link story. The likelihood a uniqueness response is absolute is very low. Some uniqueness, or probability, remains after a uniqueness challenge, yet the critics round down and ignore the leadership disadvantage entirely. On the other hand, many judges round up as well, responding to contest debaters who have begged the risk question by a final rebuttal appeal to mini-max reasoning. Risk theorists find this false dualism troubling. For example, de Sousa warns:

A pragmatic conception of probability needs something broader than mere *acceptance*. for acceptance is an on/off matter, and probability has degrees. . . . Because of the lottery paradox, *high* probabilities can never be a sufficient condition

of acceptance. And because of what I call the *Lem Paradox*¹, low probability can never be a sufficient condition of rejection." (261)

Tooley posed an even more intriguing question: "Does our world, then, simply contain an enormous number of highly unlikely accidents?" (105). The proponent of a mini-max disadvantage would want you to believe that such is true. Recently, we have learned highly unlikely accidents in a chaotic system are ordered (Bütz). If so, the extended mini-max argument might be one such ordering. Unfortunately for proponents of extended mini-max arguments, once any system is dominated by highly unlikely accidents, the logic of the extended argument corrodes. Predicting unpredictability is paradoxical.

We expect the critic in a contest debate to assess the strength of an extended argument and resolve its disposition. However, when the consequence is nearly infinite, it makes such a probability calculation thorny. Debaters seldom provide critics with a discussion of multiplicative versus correlational probability assessments, and often substitute simple corroboration for probability assessments.

While any claim made about a debate resolution by examining the plan might be deductive or inductive, the concoction of an extended argument is more akin to what C. S. Peirce called abduction. "Abduction merely suggests that something *might be*" (qtd. in Lanigan 50). As Schweder wrote, "Transcendent realities are of our own making, which sometimes succeed in binding us to the underlying reality that we imagine by giving us an intellectual tool – a metaphor, a premise, an analogy, a category – with which to live, to

¹ Lem suggested, in effect, that you calculate the probability that *you yourself exist*. Allowing your father three or four ejaculations a week for fifty years, his lifetime output of spermatozoa is likely to have been in the region of one billion, only one of which could have been you. Multiply that by the number of ova in your mother's ovaries, preferably before birth when they too number in the tens of thousands. As the offspring of your parents, then, the chances against their child being *you* is far in excess of a trillion to one. Then consider the circumstance of your parents' more or less unlikely meeting. Repeat for each of your ancestors, multiplying each result with the last. In scarcely more generations than you can personally remember, the improbability of your existence is far greater than that of finding a single atom in the universe at random. If some level of improbability were sufficient for rejection, such a mediation should lead you to doubt your own existence (de Sousa 262). See Stanislaw Lem, "De Arte Prognosendi aut de Impossibilitate Vitae," in *A Perfect Vacuum: Imaginary Reviews of Non-Existent Books*. (NY: Harcourt, Brace and Jovanich, 1979).

arrange our experience, and to interpret our experiences so arranged. In other words, the abductive faculty is the faculty of imagination" (361).

In the typical mini-max extended argument, a contest debater identifies a principle or rule, i.e., Presidential focus is limited and forces tradeoffs, then examines a result, i.e., the plan and its implications within a specific spatio-temporal political setting, and finally interpolates a case, i.e., the scenario and impact story. Such speculation is purely imaginative, especially when a debater uses multiple sources to create the argument.

Peirce proposes three rules for valid abduction: The hypothesis must explain the facts at hand. It must be capable of being subjected to experimental confirmation. It must be guided by economic considerations (Fann 59). What happens in contest debating? The contest debater hardly randomizes the observations drawn from research. While a research plan of any sort makes this unlikely, the Boolean search engines used for on-line text retrieval services, for example, make it wholly unlikely. That a contest debater might introduce exceptions within the extended mini-max argument is pure fancy. As such, even the extended mini-max argument as abduction is fallacious. As Peirce admitted, "From deduction to induction to abduction the security decreases greatly, while the uberty increases greatly" (qtd. in Fann 8). Unsurprisingly, the extended argument tends to have low validity and reliability whether deduced, induced, or abducted.

A final drawback of the extended argument is the likelihood of equivocation, particularly the term shift fallacy. Cedarbloom describes the problem.

If an expression is used more than once in an argument, it must have the same meaning throughout the argument. When a word or expression shifts meaning from one occurrence in the argument to the next, the argument commits the fallacy of equivocation.

Why do you doubt the miracles described in the Bible when you've witnessed miracles like man (sic) landing on the moon?

In the first occurrence, *miracle* means something that defies the laws of nature. In the second occurrence, *miracle* means something amazing, that you wouldn't have thought could be done. The fact that the second kind of miracle occurred doesn't make it more likely that the first kind occurred. (108)

The potential for term shifts in extended arguments is derived from the common practice of using terms distributed across several sources as a way of linking those sources in such a manner that they seem to construct a cohesive line of argument. The stringing together of

out-of-context statements from multiple sources, each unaware of the new context into which their statements have been positioned, literally begs the question of equivocation.

The Lure of Mini-Max Reasoning

Vohra warned: "There are many inherent uncertainties in the quantitative assessment of accident probability. These uncertainties include lack of sufficient data, the basic limitations of the probabilistic methods used, and insufficient information about the physical phenomena . . . relating to the potential accident situation" (211). Why then, do we accept claims associated with these probability assessments? The answer lies in the seductiveness of the mini-max principle: Act to minimize the risk of maximum disaster.

According to Kavka, under the mini-max principle, "benefits and probabilities are disregarded, and that option is considered best which promises the least bad (or most good) outcome" (46-47). This is similar to what Kavka called the *disaster avoidance principle*: "When choosing between potential disasters under two-dimensional uncertainty, it is rational to select the alternative that minimizes the probability of disaster occurrence" (50), and what Luce and Raiffa called the *maximization-of-security-level theory* (278-281).

As a number of authors have noted, the mini-max principle is fraught with difficulties. I will recount four particular pitfalls in this article.

First mini-max reasoning is grounded in ultrapessimism, or "disregarding a relevant experiment regardless of its cost" (Parmigiani 250). "The mini-max principle is founded on ultra-pessimism, [in] that it demands that the actor assume the world to be in the worst possible state" (Savage, "Statistical Decisions" 63). Savage concluded: "The mini-max rule based on negative income is ultrapessimistic and can lead to the ignoring of even extensive evidence and hence is utterly untenable for statistics" (*Foundations* 200). Furthermore, Parmigiani found that "no form of the mini-max principle is generally superior to the other in guarding against ultrapessimism. . . . [I]t is not possible to concoct a standardization method that makes the mini-max principle safe from ultrapessimism" (243, 249).

Second, mini-max reasoning is confounded by incorrect probability assessments. "Applying mini-max means ignoring the probabilities as various outcomes" (Finnis 221). One of the reasons for incorrect decisions is grounded in politics. Proponents of a mini-max claim may misrepresent the probabilities. "The group mini-max rule is also objectionable in some contexts, because, if one were to try to apply it in a real situation, the members of the group might well lie about their true probability judgments, in order to influence the

decision generated by the mini-max rule in the direction each considers correct" (Savage, *Foundations* 175). This problem is worsened as proponents incorporate lay source material into their extended arguments.

Several studies have noted that lay estimates of low probability hazards tend to be substantially higher than expert probability estimates. . . . Is it that people sensitive to risk consequences, and unwilling to accept the risk or risk management or both strategies, might systematically exaggerate the magnitude of consequences while those in the *opposite* camp might systematically *underplay* the consequential danger involved? This implies the hypothesis that *acceptance* is an *a priori* condition, and becomes a driver of likelihood and consequence assessments, at least in some instances, while *threat probabilities* become the key causal factor in acceptance in still other instances. (Nehvevajsja 522)

The third fault with mini-max reasoning is that it is "flagrantly undemocratic. In particular, the influence of an opinion, under the group mini-max rule, is altogether independent of how many people in the group hold that opinion" (Savage, *Foundations* 175). In other words, singular experts make mini-max estimations. Quasi-experts or secondary experts make some of the most bizarre extended arguments. In addition, there is an elitist sense to the process. The reasoning of the "expert" is presumptive over the opinion of individuals who are less educated, less affluent, or even less white. What happens when the elite are wrong? The arrogance of elitism is hardly more evident in any other setting. Deference to authority is an important co-requisite of extended mini-max claims in contest debates. There is an insipid maxim associated with it: "Don't understand? Don't worry. We do the thinking so you won't have to!" This problem is amplified when an exceptional source in a mini-max argument cannot be corroborated. Making a decision based on a sole opinion grossly inflates the qualifications of the source to make the claim. Consider how this issue worsens as well when the source is nameless or institutional, such as a press service.

The final pitfall of mini-max reasoning is that the persuasiveness of any such argument is a function of contingent variables, in particular, its novelty. Consider this simple illustration: A single large outcome appears to pose a greater risk than does the sum of multiple small outcomes. "It is always observed that society is risk averse with respect to a single event of large consequence as opposed to several small events giving the same total number of fatalities in the same time period. Hence 10,000 deaths once in 10,000 years is

perceived to be different from 1 death each year during 10,000 years" (Niehaus, de Leon & Cullingford 93). Niehaus, de Leon, and Cullingford extended their analysis with a review of nuclear power plant safety. "The Reactor Safety Study similarly postulated that the public appears to accept more readily a much greater social impact from many small accidents than it does from the more severe, less frequent occurrences that have a similar society impact" (93). Theorists in many different settings have described this phenomenon. Wilson, for instance, devised a way to examine the impact of low-probability high-consequence events that more clearly portrayed societal estimates of such events: "A risk involving N people simultaneously is N^2 (not N) times as important as an accident involving one person. Thus a bus or aeroplane accident involving 100 people is as serious as 10,000, not merely 100, automobile accidents killing one person" (274-275).

Testing the Probity of Mini-Max Extended Arguments

If extended arguments using mini-max reasoning is so indefensible, what can we do? Surprisingly, the answer is quite a lot.

As a starting point, we need to reject the notion that contest debating would be impossible without them. We could demand a greater responsibility on the part of arguers making mini-max claims (a subject approached below). Debaters could use their plans and counterplans to stipulate the internal link and uniqueness stories for their extended arguments, consequently focusing the debate on probability assessment and away from exaggerated impacts. Alternatively, debaters may select to discuss ideas as we have seen in the recent trend toward kritik debating.

In addition, we need to understand that burdens of proof associated with extended arguments involving mini-max reasoning are not always extraordinary. Here is one rationale why it might be imprudent to reject all instances involving mini-max claims. Consider these two questions. Should we decide to forego a civil rights initiative in the U.S. because it may lead to a war in the Middle East? Should we refrain from building a plutonium reprocessing plant nearby to avoid the heightened incidence of cancer? We might accept the second more regularly than the first. The reason the second extended argument should be more presumptive is simply because interceding variables that might preclude the consequence are less reliable than in the first scenario because they would be derivative. In other words, the fix would need to be designed by agents similarly motivated. Just like "realist" foreign policy theorists may think too much alike, so do agents who are acting

within the same agency. Unlike the second scenario, agents able to intercede between civil rights legislation and U.S.-Israeli foreign relations come from different disciplines and worldviews (different directions) and are less likely to share motivations which might prevent their capability to interpose end stops into a particular series of occurrences.

With these caveats out of the way and assuming some mini-max extended arguments are more reliable than others, I propose a number of tests by which the strength of particular mini-max extended arguments might be adduced. The tests fall into three general categories: probability and confidence, scenario construction, and perceptual bias. I offer these tests merely as suggestions and in full awareness of the fact that they hardly exhaust the potential checks on extended arguments using mini-max reasoning.

First, in addition to earlier remarks on general probability theory, we might want to learn about the source of a mini-max claim and her motivations. For example, we might want to discover whether estimates are intentional. In other words, did the journalist intend her rhetoric be linked into an argument of the sort being argued? Are the remarks actual or virtual? Did the journalist intend her rhetoric metaphorically or literally? She may have intended her remark as a rhetorical flourish rather than a causal claim. Are the explanations rational? Did the journalist intend the remark counterintuitively and is she equipped to make such a counterintuitive claim? Are the comments viable? Is the journalist's rhetoric related to the impact scenario? And, no less important, is the journalist motivated by truth or sales? Simply put, there is profit in fear. "A group that raises money for research into a particular disease is not likely to negate concerns about that disease. A company that sells alarm systems is not about to call attention to the fact that crime is down" (Glassner xxiii).

For the kritik aficionado, this hints at the political nature of risk. "When we speak of risk, however, we include a wide range of cognitive dimensions that extend well beyond the idea of risk as *quantitative* measures of hazard consequences expressed as conditional probabilities of experienced harm" (Slovic, Fischhoff & Lichtenstein 91). Slovic came close to using the world paradigm to explain the political nature of risk estimation when he warned that "public views are influenced by worldviews, ideologies, and values; so are scientists' views, particularly when they are working at the limits of their expertise (1999). He provided a useful illustration.

One way in which subjectivity permeates risks assessments is in the dependence of such assessments on judgments at every stage of the process, from the initial structuring of a risk problem to deciding which endpoints or consequences to

include in the analysis, identifying and estimating exposures, choosing dose-response relationships, and so on. For example, even the apparently simple task of choosing a risk measure for a well-defined endpoint such as human fatalities is surprisingly complex and judgmental. . . . Each way of summarizing death embodies its own set of value . . . [e.g.,] reduction in life expectancy treats deaths of young people as more important than deaths of older people, who have less life expectancy to lose (690).

Researchers such as Earle and Cvetkovich have noted intercultural variations as well. "Risk is culturally constructed: individuals' expressions of concern about hazards are guided by the expected implications of those expressions for the individuals' preferred way of life. . . . Cultural approaches to risk management also differ in their emphases on cultural stasis and cultural change. [For example,] since risk management conflicts are understood to be the products of cultural differences, the generation of (nonimposed) solutions to these conflicts depends on the emphasis that is placed on cultural change relative to cultural stasis" (55-56). While much research examines views across cultures separated by national boundaries, much of the research also deals with intranational cultural variations.

A second set of tests is associated with the narratives, or scenarios, constructed within the mini-max extended argument. Scenarios are imaginistic constructions abduced from rules and results.

Prior to initiating interaction, interactants evaluate the goals that they have for the interaction in light of the information that they have about the situation (its norms, resources, and constraints) and the information that they have about their fellow interactants (expectancy information). In conducting this evaluation they generate scenarios concerning how the interaction is likely to unfold as a function of the tactics available to them. (Hilton, Darley & Fleming 46)

As Hilton, Darley, and Fleming suggest, "Situations create and possess resources that make certain kinds of strategic moves possible or impossible" (49). Doran warned about the incorporation of unlikely events as variables:

In international relations at least, the problem is not that all forecasting is useless, but that forecasting that must contend with nonlinearities is useless. . . . When conditions are propitious and behavior over time is approximately linear, the linear forecast will fit that data tolerably well. But forecasts ultimately fail because no

technique has been developed that allows the forecaster to predict, prior to the event itself, when a nonlinearity will occur. (34, 11)

Put more simply, before we can evaluate a scenario, we would need to learn who the actors are or would be. It is imprudent to predict the behavior of over generalized and unidentified participants; different people behave differently to similar stimuli and overgeneralization is an exercise in bigotry. We would need to ask the following questions as well: What would be predictable behavior? To borrow a term from counterfactuals, predicting behavior like behavior normally observed, hence from *nearest possible world*, would tend to avoid *noise*. Noise is the measurement of error reflected in the *variance* around a regression line fitted through a set of data points. As the behavior becomes more unusual and is less like the actual world, the noise will increase. "In general, there is an inverse relationship between the amount of noise around the trend-line of a prediction and the reliability of the forecast" (Doran 15). What would be a rational time frame? To borrow another term from counterfactuals, as a virtual world distances itself from the actual world, the breadth of *possible branching points* increases. "As one projects further and further into the future, the reliability of the forecast becomes less and less. This is expressed in the well-known aphorism, 'The best forecast is the last forecast.' As one attempts to forecast further and further into the future, the amount of error introduced into the forecast becomes greater and greater" (Doran 13). Moreover, is the scenario usable? "Model uncertainty is frequently important when the system involved is sufficiently complex that key influences have not been identified, or have been intentionally omitted or simplified to make the model computationally tractable" (Casman, Morgan & Dowlatabadi 33-34). Some scenarios are purposefully simplified so they work. While including every conceivable variable "will not pass the laugh test in real-world policy circles . . . identifying some and getting part way to a full treatment is clearly better than simply ignoring the possibilities" (Casman, Morgan & Dowlatabadi 34, 41). Testing scenarios would solve more of the false persuasiveness of mini-max extended arguments.

A final set of tests deal with perceptual bias. Here are some fundamental observations about the psychology of risk analysis and communication. The research on bias is exceptionally dense and extensive. Here are four of the more prominent indictments of perceptual bias.

The first is overweighting. "Low probabilities are commonly overweighted but intermediate and high probabilities are usually underweighted relative to certainty. . . . The

overweighting of small probabilities can give rise to risk seeking in the positive domain and risk aversion in the negative domain. . . . The inflated effect of small probabilities contributes to the appeal of lottery tickets and accident insurance" (Kahneman & Tversky 164). A probability closer to zero appears *more* greater than zero than do probabilities in the intermediate range of probability. The distance between .10 and .00 is .10. The distance between .40 and .30 is also .10. But the distance between .10 and .00 seems greater than the distance between .40 and .30. That is overweighting.

The second perceptual problem is framing bias. "Framing effects arise when the same objective alternatives are evaluated in relation to different points of reference" (Kahneman & Tversky 166). Risk is depressed and inflated depending on the frame. Kahneman and Tversky offer this illustration.

If Program *A* is adopted, 200 people will be saved. If Program *B* is adopted, there is a 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved. Which of the two programs would you favor? The majority response to this problem is a risk-averse preference for Program *A* over Program *B*. Other respondents were presented with the same problem but a different formulation of programs: If Program *C* is adopted, 400 people will die. If Program *D* is adopted, there is a 1/3 probability that nobody will die and a 2/3 probability that 600 people will die. The majority choice in the problem is risk seeking. . . . The only difference is that in the first version the death of 600 people is the normal reference point and the outcomes are evaluated as gains, whereas in the second version no deaths is the normal reference point and the programs are evaluated in terms of lives lost (Kahneman & Tversky 166, 168).

The third is negative bias. In an interesting study by Stallen, Geerts, and Vrijling, the researchers examined different conceptions of quantified societal risk. "Results of the study showed a clear aversion to catastrophes . . . but no clear relationship of aversion with the number of fatalities was found" (642). This is a major problem because "just as individuals give greater weight and attention to negative events, so do the news media. . . . Adding fuel to the fire of asymmetry is yet another idiosyncrasy of human psychology – sources of bad news tend to be seen as more credible than sources of good news" (Slovic 698).

The final indictment of perception centers on deletion bias. Since the affirmative plan and the negative counterplan do not actually exist, canceling them does not seem to involve extirpation. All extirpations carry a tax. As Kahneman and Tversky put it:

It is often easier to mentally delete an event from a chain of occurrences than it is to imagine the insertion of an event into the chain. Such a difference in imaginability could help to explain the observation that the regret associated with failures to act is often less intense than the regret associated with the failure of an action. . . . In general, the anticipation of regret is likely to favor inaction over action and routine behavior over innovative behavior. (173)

If the truth be told, debate critics are ill-prepared to evaluate mini-max arguments. While these arguments demand a systematic processing methodology, critics engage in something akin to a heuristic-systematic model. "Systematic processing is defined by effortful scrutiny and comparison of information, whereas heuristic processing is defined by the use of cues to arrive more easily at a judgment. . . . This mode requires less effort and fewer resources" (Trumbo 391). Unfortunately, the cues are politically and culturally constructed and reflect the biases mentioned above.

Conclusions

It is difficult for me to suggest mini-max reasoning should go the way of should-would, counter-warrants, or intrinsicness arguments. That role seems too akin to Ayatollah Khomeini's *fatwa* on Salman Rushdie. Instead, my purpose has been to provide tests to challenge mini-max reasoned claims.

No contest debater can be expected to disprove all mini-max disadvantages. Without demanding some minimal level of likelihood, the debater would find her days and nights subverted, if not totally consumed, by on-line text-retrieval downloading by entering seemingly endless strings of search terms and Boolean connectors. It is simply uneconomical especially when contest debaters are also students and young adults.²

As an exercise in a logic classroom, mini-max claim making might be worthwhile. While mini-max reasoning may serve a productive function in some risk aversive situations, its role in contest debating seems uneconomical, hence a improper argument construction

² Another solution has been to hire card cutters (fifth year undergraduates), graduate assistants, or others to do the research to keep on the edge of the mini-max disadvantages. I will leave this issue for others to address.

exercise. The nearly socio-pathological and paranoiac preoccupation with chasing improbable specters riding double behind apocalyptic horsemen is hardly productive training for undergraduate contest debaters. One of my primary concerns has been to reduce unwarranted fears and not add to them. As Glassner put it:

We had better learn to doubt our inflated fears before they destroy us. Valid fears have their place; they cue us to danger. False and overdrawn fears only cause hardship. . . . The short answer to why Americans harbor so many misbegotten fears is that immense power and money await those who tap into our moral insecurities and supply us with symbolic substitutes. (xv, xxvii)

Teachers are not seducing our children. Urban crime is decreasing. Planes are safe. Whites are many times safer than African-Americans are from African-American precipitated violence. Mothers seldom kill their own children. Moreover, schools are safe places.

You may think this case has been over made or worse that it describes a very low probability occurrence with an exaggerated consequence. If so, then rejecting my arguments compels you to reject extended arguments using mini-max reasoning as well. I believe I have not replaced one fear with another. But if rejecting one means rejecting both, I have succeeded. Hence, I end with this adage: We must avoid thinking that allows smoke to trump fire.

Works Cited

- Bashor, Mark. "International Terrorism and Weapons of Mass Destruction." *Risk Analysis* 18:6. (August 1998): 675-678.
- Bayes, Thomas. (1702-1761). An Essay Towards Solving a Problem in the Doctrine of Chances. *London Philosophical Transactions: 370-418.* (1763). Reprinted in *Biometrika* 45 (1958): 293-315.
- Bütz, Michael R. *Chaos and Complexity: Implications for Psychological Theory and Practice.* Washington, DC: Taylor & Francis, Pub. 1997.
- Casman, Elizabeth, M. Granger Morgan, and Hadi Dowlatabadi. "Mixed Levels of Uncertainty in Complex Policy Models." *Risk Analysis* 19:1 (January 1999): 33-42.
- Cedarbloom, Jerry and David W. Paulsen. *Critical Reasoning: Understanding and Criticizing Arguments and Theories.* 2nd Ed. Belmont, CA: Wadsworth Co. 1986.
- Cohen, L. Jonathan. "The Problem of Prior Probabilities in Forensic Proof." *Ratio* 24:1 (1982): 71-76.
- de Sousa, Ronald. "Comments on Barbara S. Stengel: Thinking about Thinking: Wilfred Sellars' Theory on Induction." *Philosophy of Education: Proceedings of the Annual Meeting of the Philosophy of Education Society* 43 (1987): 259-262.
- Doran, Charles. "Why Forecasts Fail: The Limits and Potential of Forecasting in International Relations and Economics." *International Studies* (1999): 11-41.
- Earle, Timothy and George Cvetkovich. "Culture, Cosmopolitanism, and Risk Management." *Risk Analysis* 17:1 (January 1997): 55-65.
- Fann, K. T. *Peirce's Theory of Abduction.* The Hague: Martinusnijhoff. 1970.
- Finnis, John, Joseph M. Boyle, Jr. and Germain Grisez. *Nuclear Deterrence, Morality and Realism.* Oxford: Clarendon Press. 1987.
- Glassner, Barry. *The Culture of Fear: Why Americans are Afraid of the Wrong Things.* NY: Basic Books. 1999.
- Heim, Michael. *The Metaphysics of Virtual Reality* NY: Oxford UP. 1993.
- Hilton, James L., John M. Darley, and John H. Fleming. "Self-Fulfilling Prophecies and Self-Defeating Behavior." *Self-Defeating Behaviors: Experimental Research, Clinical Impressions, and Practical Implications.* Ed. Rebecca C. Curtis. NY: Plenum Press. 1989: 41-65.
- Kahneman, Daniel and Amos Tversky. "The Psychology of Preferences." *Scientific American* 256:1 (January 1982): 160-173.

- Kavka, Gregory. "Deterrence, Utility and Rational Choice." *Theory and Decision* 12:1 (March 1980): 41-60.
- Krause, Lawrence. *Beyond Star Trek: Physics from Alien Invasions to the End of Time*. NY: Basic Books. 1997.
- Lanigan, R. L. "From Enthymeme to Abduction: The Classical Law of Logic and the Postmodern Rule of Rhetoric." *Recovering Pragmatism's Voice: The Classical Tradition, Rorty, and the Philosophy of Communication*. Eds. Lenore Langsdorf and Andrew R. Smith. Albany, NY: State University of New York Press. 1995: 49-70.
- Laplace, Pierre. (1749-1827). *A Philosophical Essay on Probabilities*. Paris. 1814. Minneola, NY: Dover Press. 1951.
- Lem, Stanislaw. "Cezar Kouska *De Impossibilitate Vitae* and *De Impossibilitate Prognoscendi*, (2 volumes Statni Nakladatelstvi N. Lit., Prague): A Review." *A Perfect Vacuum*. Trans. M. Kandel. NY: Harcourt Brace Jovanovich. 1979: 141-166.
- Lichtman, Alan and Daniel Rohrer. "The Logic of Policy Dispute." *Journal of the American Forensic Association* 16 (Spring 1980): 236-247.
- Luce, R. Duncan and Howard Raiffa. *Games and Decisions*. NY: John Wiley & Sons. 1957.
- Nehnevajsa, Jiri. "Low-Probability/High-Consequence Risks: Issues in Credibility and Acceptance." *Low Probability High Consequence Risk Analysis: Issues, Methods, and Case Studies*. Eds. Ray A. Waller and Vincent T. Covello. NY: Plenum Press. 1984: 521-529.
- Niehaus, F., G. de Leon, and M. Cullingford. "The Trade-Off Between Expected Risk and the Potential for Large Disasters." *Low Probability High Consequence Risk Analysis: Issues, Methods, and Case Studies*. Eds. Ray A. Waller and Vincent T. Covello. NY: Plenum Press. 1984: 91-105.
- Parmigiani, Giovanni. "Minimax, Information and Ultrapessimism." *Theory and Decision* 33:3 (November 1992): 241-252.
- Richet, Charles. *L'homme Stupide*. Paris: E. Flammarion. 1919.
- Savage, Leonard J. "The Theory of Statistical Decision." *Journal of the American Statistical Association* 46:253 (March 1951): 54-67.
- _____. *The Foundations of Statistics*. NY: John Wiley & Sons, Inc. 1954.
- Schell, Jonathan. *The Fate of the Earth*. NY: Alfred A. Knopf. 1982.

- Schweder, Richard. *Thinking Through Cultures: Expeditions in Cultural Psychology*. Cambridge, MA: Harvard University Press. 1991.
- Singpurwalla, N. "Statistics in Low-Probability/High-Consequence Risk Analysis. Introduction - Part 1." *Low Probability High Consequence Risk Analysis: Issues, Methods, and Case Studies*. Eds. Ray A. Waller and Vincent T. Covello. NY: Plenum Press. 1984: 181-182.
- Slovic, Paul. "Trust, Emotion, Sex, Politics, and Science: Surveying the Risk-Assessment Battlefield." *Risks Analysis* 19:4 (August 1999): 689-701.
- Slovic, Paul, Baruch Fischhoff, and Sarah Lichtenstein. "Characterizing Perceived Risk." *Perilous progress: Managing the Hazards of Technology*. Eds. Robert W. Kates, Christoph Hohenemser and Jeanne X. asperson. Boulder, CO: Westview Press. 1985: 91-125.
- Stallen, Pieter Jan, Rob Geerts and Han Vrijling. "Three Conceptions of Quantified Social Risk." *Risk Analysis* 16:5 (October 1997): 635-644.
- Tabori, Paul. *The Natural History of Stupidity*. NY: Barnes and Noble Books. 1993.
- Thompson, Paul T. and William J. Parkinson. "Situation Specific Indicators for Distinguishing between High Consequence/Low-Probability Risk and Low-Consequence/High-Probability Risk." *Low Probability High Consequence Risk Analysis: Issues, Methods, and Case Studies*. Eds. Ray A. Waller and Vincent T. Covello. NY: Plenum Press. 1984: 551-567.
- Tooley, Michael. *Time, Tense, and Causation*. Oxford: Clarendon Press. 1997.
- Trumbo, Craig. "Heuristic-Systematic Information Processing and Risk Judgment." *Risk Analysis* 19:3 (June 1999): 391-400.
- U. S. Nuclear Regulatory Commission. *An Approach to Quantitative Safety Goals for Nuclear Power Plants*. NUREG-0739. October 1980.
- Vohra, K. G. "Statistical Methods or Risk Assessment for Energy Technology." *Low Probability High Consequence Risk Analysis: Issues, Methods, and Case Studies*. Eds. Ray A. Waller and Vincent T. Covello. NY: Plenum Press. 1984: 201-215.
- Wilson, Richard. "The Costs of Safety." *New Scientist* 68 (October 30, 1975): 274-275.