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Retrospectives
The Cold-War Origins of the Value of Statistical Life

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This feature addresses the history of economic terms and ideas. The hope is to deepen the workaday dialogue of economists, while perhaps also casting new light on ongoing questions. If you have suggestions for future topics or authors, please write to Joseph Persky of the University of Illinois at Chicago at jpersky@uic.edu.

Introduction

The value of statistical life (VSL) is a concept used in benefit–cost analysis by government and intergovernmental agencies around the world to place monetary values on changes in premature deaths. Common applications include the estimation of benefits of highway traffic safety measures and reductions in air pollution. Typically, these mortality values comprise the lion's share of the estimated benefits of such investments (for example, US EPA 2011). For introductions to the VSL literature, useful starting points are Ashenfelter (2006), Blomquist (forthcoming), Hammitt (2000), Viscusi (2011), and Viscusi and Aldy (2003).

The "value of statistical life" terminology was introduced by Thomas Schelling (1968) in his essay, "The Life You Save May Be Your Own." To that point, when economists grappled with tradeoffs involving loss of life, they had basically two approaches

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available. The first was a human capital approach, which valued the life of an individual according to the value of that person's wages. The second looked to the revealed social values from policymakers. Both approaches were unsatisfactory: the first was plagued with ethical problems; the second seemed circular, as it would use policy decisions to inform policy decision making (Banzhaf 2009).

Schelling's (1968) crucial insight was that economists could evade the moral thicket of valuing "life" and instead focus on people's willingness to trade off money for small risks. For example, a policy to reduce air pollution in a city of one million people that reduces the risk of premature death by one in 500,000 for each person would be expected to save two lives over the affected population. But from the individuals' perspectives, the policy only reduces their risks of death by 0.0002 percentage points. This distinction is widely recognized as the critical intellectual move supporting the introduction of values for (risks to) life and safety into applied benefit–cost analysis (Ashenfelter 2006; Hammitt and Treich 2007). Although it is based on valuing risk reductions, not lives, the value of a statistical life concept maintains an important rhetorical link to the value of life insofar as it normalizes the risks to value them on a "per-life" basis. By finessing the distinction between lives and risks in this way, the VSL concept overcame the political problems of valuing life while remaining relevant to policy questions.

Though widely used, the concept of the value of a statistical life has never been without controversy. For example, in 2003 the US Environmental Protection Agency (EPA) set a lower value for the VSLs of elderly citizens than for younger citizens, to account for their fewer remaining life-years. Popular outcry against this "senior death discount," given full voice in the US Congress, forced the EPA to retreat.

In this paper, I trace the history of the value of a statistical life and show that such controversies are nothing new. Although the first use of the term was by Schelling (1968), the intellectual origins of the VSL can be traced back another 20 years to a controversy in which the US Air Force (USAF) forced the RAND Corporation to think about the role of lives in its optimization framework for military decisions, a problem that eventually would attract Schelling's attention. Thus, not only is the VSL well acquainted with political controversy, it was born from such controversy.

RAND's "Criterion Problem"

To understand the origins of the value of statistical life, we must back up some two decades before Schelling's essay to the early years of the RAND Corporation. RAND began in 1946 inside the Douglas Aircraft Company and then became independent in 1948 with support from the Ford Foundation. RAND wanted to reimagine the nascent operations research methods of World War II on a grand scale, with modern technical expertise. From its early focus on science and engineering, it expanded to include economics and policy studies. Under Warren Weaver, it soon established a research section on the "evaluation of military worth." The idea, explained Weaver (as quoted in Kaplan 1983, p. 72), was to explore "to what extent

it is possible to have useful quantitative indices for a gadget, a tactic or a strategy, so that one can compare it with available alternatives and guide decisions by analysis . . .” A new economics division, led by Charles Hitch, was constituted inside the evaluation of military worth division. RAND also expanded its technical capacity, for example constructing a special Aerial Combat Research Room to simulate aerial maneuvers in a game-theoretic context and acquiring, with help from John von Neumann, one of the first EDVAC binary computers to crunch the numbers.[1]

RAND’s first big opportunity to showcase its new analytical capabilities came in 1949, shortly after the Soviet Union detonated its first atomic bomb. The US Air Force asked RAND to apply systems analysis to design a first strike on the Soviets. The “Strategic Bombing Systems Analysis,” led by Edwin Paxson, attempted to use operations research methods to find the optimal mix of atomic bombs and bombers (Jardini 1996; Hounshell 1997). Specifically, it sought to solve a classic problem formulated in terms of choosing bombs and bombers to maximize damage, subject to a fixed dollar budget (to procure, operate, and maintain the force) and fixed budget of fissile material (Jardini 1996, p. 54).

Paxson and RAND were initially proud of their optimization model and the computing power that they brought to bear on the problem, which crunched the numbers for over 400,000 configurations of bombs and bombers using hundreds of equations (Kaplan 1983; Jardini 1996). The massive computations for each configuration involved simulated games at each enemy encounter, each of which had first been modeled in RAND’s new aerial combat research room. They also involved numerous variables for fighters, logistics, procurement, land bases, and so on. Completed in 1950, the study recommended that the United States fill the skies with numerous inexpensive and vulnerable propeller planes, many of them decoys carrying no nuclear weapons, to overwhelm the Soviet air defenses. Though losses would be high, the bombing objectives would be met.

While RAND was initially proud of this work, pride and a haughty spirit often go before a fall. RAND’s patrons in the US Air Force, some of whom were always skeptical of the idea that pencil-necked academics could contribute to military strategy, were apoplectic. RAND had chosen a strategy that would result in high casualties, in part because the objective function had given zero weight to the lives of airplane crews (Hirshleifer 1950; Jardini 1996). In itself, this failure to weigh the lives of crews offended the US Air Force brass, many of whom were former pilots. But moreover, that failure led RAND’s program to select cheap propeller bombers rather than the newer turbojets the US Air Force preferred.[2] For all of RAND’s

[1] For background on the history of RAND, useful starting points are Hounshell (1997), Jardini (1996), Kaplan (1983), and Smith (1966). Leonard (1991) and Mirowski (2002) discuss its role in shaping modern economics.

[2] The problem was also compounded by what the US Air Force perceived as other errors. RAND’s analysis had unnecessarily (indeed, unrealistically) restricted the bombers to North American bases, even though actual plans called for using America’s many forward bases as refueling points (Kaplan 1983). Additionally, it had assumed the “game” was over after the first strike, so crews did not have value for additional flights. Both assumptions tilted the analysis in favor of propeller planes.

scientific equations and modern computing power, in the eyes of its US Air Force patrons its first product was a classic case of garbage in, garbage out.

RAND adapted to this debacle in three ways. First, recognizing that its first major study could prove to be its last, RAND quickly retreated and adopted a more humble posture. It rushed a follow-up study, this one from Paxson's assistant Edward Quade, which incorporated some of the criticism from the Pentagon. In particular, it narrowed the question to the choice of bomber type, adopted the US Air Force's attack plan, and assumed the possibility of additional strikes after the first strike (Jardini 1996, p. 64). Likewise, RAND quickly altered course for its proposed second major project, this one on air defense systems analysis. Headed by Edward Barlow, the first draft of this project proposal had been a massive 100-page document filled with lots of math, but with dangerously simple assumptions, such as a single strike and a lack of submarines. As RAND began to feel the full force of the US Air Force's displeasure, the proposal was cut to a slim 16 pages, devoid of arrogance (Barlow 1950). Indeed, Barlow now admitted that "the great dangers inherent in the systems analysis approach are that factors which we aren't yet in a position to treat quantitatively tend to be omitted from serious consideration" (as quoted in Jardini 1996, p. 67).

Second, as a matter of long-run strategy, RAND began to diversify its research portfolio beyond military work, into natural resources, health, education, and other areas of social policy.[3] The earliest nonmilitary work seriously occupying RAND staff appears to have been applied work on water resources (DeHaven and Hirshleifer 1957; Hirshleifer, DeHaven, and Milliman 1960), followed by projects in transportation and education begun around 1960 (Goldstein 1961). Interestingly—and likely not coincidentally—when RAND economists took up water resources, they were explicitly entering a research area where the problem of using nonmarket valuation to fill in missing prices was one of the main problems motivating contemporary literature (Banzhaf 2009, 2010).

Most importantly for this story, RAND's third response to the debacle was to try to put actual weights on airplane crews in its objective functions, applying nonmarket valuation to this very problem. Inside RAND, this came to be known as the "criterion problem"—essentially the problem of specifying what today are often called "indicators" for imperfectly observed or measured objectives, on both the cost and the benefit side. RAND's economists were quick to argue that this was fundamentally an economic problem (Leonard 1991).

Jack Hirshleifer was particularly fast off the mark, expressing his opinions on the debacle in internal memoranda almost immediately (Hirshleifer 1950). He emphasized two issues. First, the bombing study imposed unnecessary constraints on the problem, especially the available quantity of fissile material. From the long-run

[3] Jardini (1996) explores these moves in some detail, dating the decisive steps as occurring in the mid to late 1960s. However, in fact they occurred earlier. As early as 1952, the Ford Foundation provided RAND with a $1 million grant to begin a new program, known as RAND-Sponsored Research, to take up nonmilitary topics "in the public interest" as well as military and geopolitical topics.

perspective of strategic planning, one could acquire more fissile material given the overall resource constraints. The needless constraint on fissile material contributed to the use of numerous decoy planes serving little purpose except to be shot down.

The second problem Hirshleifer (1950) emphasized was missing prices. Hirshleifer reasoned analogously from profit maximization, but whereas profits involve sales and inputs, both priced in the common coin of dollars, in military applications like the bombing study, prices were missing from both sides of the ledger. On the benefits side, there was the question of quantifying damage to the enemy. But, argued Hirshleifer, the main question raised by the bombing study centered on the "cost concept (dollars, crews, or planes) to be used."

Hirshleifer (1950 p. 5) noted that airplane crews can be priced by the cost of training and replacing them, but added:

> [We may] set a value on human life higher than the mere training cost of a replacement. A man may cost $10,000 in terms of a training cost to replace, but we may prefer to lose $15,000 in materials or machines if we can save the man. This sentence points the way to costing loss of men, if the condition described actually holds true. Obviously, there is a limit to the materials or machines we will sacrifice to save the man, and our losses in men should be valued in terms of this limit, cold-blooded as it may sound. In many respects lives and dollars are incommensurable, but unfortunately the planners must compare them.

Hirshleifer followed up on this issue along with other economists (including Armen Alchian, Stephen Enke, and Charles Hitch) a few months later. Alchian et al. (1951, p. 20) wrote:

> In our society, personnel lives do have intrinsic value over and above the investment they represent. This value is not directly represented by any dollar figure because, while labor services are bought and sold in our society, human beings are not. Even so, there will be some price range beyond which society will not go to save military lives. In principle, therefore, there is some exchange ratio between human lives and dollars appropriate for the historical context envisioned to any particular systems analysis. Needless to say, we would be on very uncertain ground if we attempted to predict what this exchange ratio should be.

In the short term, RAND's response to this dilemma was to drop its goal of a general theory of air warfare, avoid incommensurables, and focus on smaller subsidiary problems where apples could be compared to apples (Alchian et al. 1951). The idea, known as "sub-optimization," was to isolate a smaller portion of the system and maximize the objective over those variables, taking the other variables as fixed constraints in the problem. In other words, the analyst could trace out the efficient frontier between dollars and lives. Decision makers in the Pentagon or the civilian

government could eventually make the call (Alchian et al. 1951; Hitch and McKean 1960, chap. 10).[4] This notion of sub-optimization was a major theme in much of Hitch's work and his colleagues' for the next decade, and the example of the lives of bomber crews remained the quintessential example motivating the work into the 1960s (Hitch 1953, 1955; Hitch and McKean 1960; McKean 1963).

Although it was no longer on the front burner, clearly the problem raised by Paxson's strategic bombing study was still simmering at RAND ten years later. That said, the wisdom of seeking "missing prices" so that incommensurables like dollars and human lives could be put into the same equation was not a settled matter at RAND. For their part, Hitch and McKean thought it ought not be attempted. They recommended several variations on the vector approach of calculating the efficient frontier, identifying the tradeoffs among incommensurables, rather than optimizing by choosing from the frontier.

Others were more hopeful that the seemingly incommensurable dollars and lives could be made commensurate by examining the revealed preferences of the US Air Force. Alchian et al. (1951, p. 29) argued that, once the efficient frontier is identified,

> Presumably it will be the responsibility of the Air Force or the [Joint Chiefs of Staff] to select one of the points as the most sensible one. Of course, any such selection implies a definite exchange ratio between lives and dollars. If this ratio could be revealed to the designers of bombing systems at an early stage they could explicitly determine the most effective system in terms of job done for a combined cost. While probably impossible in this particular case, we ought to avoid whenever possible the presentation of results only in efficient combination form. This yields the weakest possible ordering of the results given minimum rationality assumptions. All effort should be made to utilize whatever information we have about the relative values of the various inputs.

Alchian et al. presumed that ultimately it is the responsibility of the US Air Force to make the tradeoffs between lives and machines, not RAND. Nevertheless, they argued "all effort" should be made to understand those "exchange ratios" and build them into the design phase, rather than merely to present decision makers with an efficient frontier from which to choose. That effort would soon come from Thomas Schelling and his student Jack Carlson.

[4] This approach, sometimes referred to as multiobjective benefit–cost analysis, would also be developed in the context of water resources, where it was quite controversial (Banzhaf 2009). The parallel developments between these two fields, RAND's participation in both, and the Ford Foundation's backing of both, is striking.

Carlson and Schelling

Thomas Schelling (b. 1921) is a Nobel prize–winning economist famous for his work on strategy, conflict, and cooperation.[5] Schelling received his BA from Berkeley in 1944 and his PhD from Harvard in 1951. During the last years of World War II, he served in the fiscal division at the Bureau of the Budget under Harvard economist Arthur Smithies, an advisor to many second-generation architects of applied welfare economics. Schelling joined RAND as an adjunct fellow in 1956 and spent the summer of 1957 there, followed by a whole year during 1958–59 with Hitch as his host, a year which he recalled as the most productive in his career (Schelling 2009). He also had direct connections to the Pentagon, working with it in the early 1960s to construct war games and advising on the Vietnam conflict (Sent 2007). Thus, Schelling joined RAND a few years after the debacle of the strategic bombing analysis, and visited with Hitch during years when Hitch continued to reflect on the criterion problem and continued to illustrate it with the formative example of valuing the lives of airplane crews.

Jack Carlson (1933–1992) was a former Air Force fighter pilot who completed his dissertation, entitled "The Value of Life Saving," in 1963 under Schelling and Smithies. After beginning his academic career at the Air Force Academy, Carlson went on to a career in government—in the Council for Economic Advisors, the Office of Management and Budget, and as an assistant secretary of the interior—then as head of the National Association of Realtors. Whether the idea to address the question of valuing life-saving came to Carlson and Schelling via RAND or via Carlson's experience in the Air Force is not clear, though to the best of Schelling's recollection the initial idea for the dissertation topic was Carlson's.[6] What is clear is that the issue had been one of considerable policy relevance to the US Air Force for some time.

At the time Carlson and Schelling were turning their attention to the problem, seemingly the only approach to valuation of life was the human capital approach, in which a person's life was valued either by their gross earnings or their net earnings after subtracting personal consumption. The approach was used by the courts and some economists (for example, Weisbrod 1961), but on the whole, economists in the 1960s seemed to feel it was inappropriate for valuing a life. Human capital might reflect the material contribution of a person to the market economy, but it evidently ignored nonmarket contributions, not to mention a person's own valuation of his or her life. (Is a retiree of no value to society? Or a homemaker? Do the person's own feelings count?)

How this problem could be overcome was not clear. Nevertheless, both public and private investments in life saving have associated opportunity costs.

[5] For background on Schelling and appraisals of his career, see Sent (2007) and Zeckhauser (1989). For interviews, see Schelling (2009) and Carvalho (2007).
[6] Personal correspondence with Thomas Schelling, November 16, 2013.

Consequently, there are trade-offs to be made, and therefore economic choices (Fromm 1965; Spengler 1968; Weisbrod 1961).

But if economists were clear on the idea that there were choices to be made, they were less clear on what the precise nature of that choice was and who was making it. A number of economists recognized that individuals make tradeoffs between risks and money (for example, Fromm 1965; Mushkin 1962). Reading back in light of Schelling (1968) and the subsequent literature, it is tempting to view that work as a proto-value-of-statistical-life literature. Until Schelling's (1968) essay, however, there was no clear connection between those individual's tradeoffs over *risks* and the apparent policy-relevant question of the value of *lives*. To illustrate the point, consider an applied problem like measuring the benefits of a highway safety improvement. For a policymaker standing outside the risk pool, it is entirely natural to approach that problem by asking how many lives it would save. The next logical question would be, what is the value of those lives? How individual values for risks came into it was by no means obvious.

The issue was also tied up with evolving views during the period about the relative roles of consumer sovereignty and political or social sovereignty (Banzhaf 2009, 2011). Though economists could agree that there were tradeoffs to be made, they were not of one mind about who was making those tradeoffs. For private goods, it was clear that individuals decided. For public questions about national defense, public safety, clean air and water, or the distribution of income, the decision maker was not so clear. Some economists felt consumers should be sovereign and that their values for these things should be aggregated up to a social value. From this perspective, benefit–cost analysis could be used to judge or *evaluate* public policies.

Others felt these were inherently social questions that only the political process could answer. Consequently, political representatives were sovereign and their willingness to trade off among these goods was what mattered. From this perspective, benefit–cost analysis could be used to *inform* decision-making. First, economists could present the political authorities with an efficient frontier. Once those authorities revealed their willingness to trade off lives for other goods by choosing points on the frontier, in later phases those "exchange ratios" could be built into the design. This latter view seemed especially compelling in the case of human lives. No individual would be willing to trade his or her own life for other social goods. But because that was the relevant policy choice, apparently society had to make the choice as a moral matter. Wrestling with this dilemma, the literature in the 1950s and 1960s was quite vague about whose values were at stake (for example, Fromm 1965; Mushkin 1962; Valavanis 1958; Weisbrod 1961).

All these issues arose in Carlson's (1963) dissertation. Life saving, he wrote, is an economic activity because it involves making choices with scarce resources. For example, he noted that the construction of certain dams resulted in a net loss of lives (more than were expected to be saved from flood control), but, in proceeding with the projects, the public authorities revealed that they viewed those costs as justified by the benefit of increased hydroelectric power and irrigated land. In considering how to evaluate those tradeoffs in formal benefit–cost analysis, Carlson considered

the human capital approach to be "usable as a first approximation" (p. 86) but to fall short of the full contributions of a person to society. A better approach was to find people making actual choices that revealed their willingness to trade lives for other social goods.

Not surprisingly given his own career and Schelling's RAND connections, Carlson considered choices about life-saving within the context of US Air Force applications. Taking the approach Hirshleifer had outlined ten years earlier, Carlson considered the willingness of the US Air Force to trade off costs and machines to save men in two specific applications. One was the recommended emergency procedures when pilots lost control of the artificial "feel" in their flight control systems. A manual provided guidance on when to eject and when to attempt to land the aircraft, procedures which were expected to save the lives of some pilots at the cost of increasing the number of aircraft that would be lost. This approach yielded a lower bound on the value of life of $270,000, which Carlson concluded was easily justified by the human capital cost of training pilots. (Note the estimate was a lower bound, as the manual revealed, in specifying what choices to make, that lives were worth at least that much.) Carlson's other application was the capsule ejection system for a B-58 bomber. The US Air Force had initially estimated that it would cost $80 million to design an ejection system. Assuming a range of typical cost over-runs and annual costs for maintenance and depreciation, and assuming 1–3 lives would be saved by the system annually, Carlson (p. 92) estimated that in making the investment the USAF revealed its "money valuation of pilots' lives" to be at least $1.17 million to $9.0 million. (Although this was much higher than the estimate from the ejection manual, the two estimates, being lower bounds, were not necessarily inconsistent.)

Importantly, as the RAND economists did earlier, Carlson took the public perspective: it was a matter of either the government generally, or the US Air Force specifically, to make tradeoffs between lives and equipment. This perspective seems natural for military applications. An Air Force general would certainly factor casualty rates into decision making, but the general would hardly weight those casualties by the preferences of the airmen involved. It would be the general's decision to make based on the general's personal willingness to trade off damage to the enemy for *lives*. Again, I emphasize "lives" here because from the standpoint of the public agency, the outcome is the number of lives saved in the aggregate population, not risks. Consequently, it was perfectly natural for Carlson (1963) to call these estimates the value of "life saving" or the "value of human life" (pp. 89, 96) and even the "costs and benefits . . . of preserving a particular life or lives" (p. 1).

Interestingly, however, Carlson had earlier in his dissertation briefly considered the case of hazardous duty pay, in which an individual reveals information about willingness to accept added on-the-job risk for a compensating increment to income. Here, the decision maker was not a public agency, but an individual choosing a job. Carlson gave examples from the private sector as well as volunteer positions in the military. For example, he figured that a pilot willingly increases the annual risk of dying (during peace-time) by 0.00232 to 0.00464 percentage points,

for some $2,280 of increased pay.[7] *If* Carlson had followed the methodology he had used when considering the public choice applications, he *might* have divided $2,280 by those risks to estimate a per-life value of $491,000 to $983,000. Tellingly, Carlson did not do so in this case: he left it as $2,280, the willingness to accept for that range of risks.

The fundamental (albeit implicit) distinction here appears to be the individual perspective versus the social perspective. For the individual as a decision maker, it was only a matter of evaluating risk, so there was no point in aggregating up to per-life values. In contrast, when the public agency was the decision maker, it was a matter of the realizations of the individuals' risks aggregated over the group (expected lives), hence it made sense to convert the values to dollars per life.

Taking up the subject five years after his student, Schelling's (1968) crucial move was to finesse this distinction. At the outset of his essay, Schelling wanted to make clear that he was by no means tackling the question of the "worth of human life" itself. That question, he suggested, was rightfully tied up in moral questions and was too "awesome" for an economist to even begin to address. Rather, Schelling made clear that his more modest objective was to value the postponement of deaths; and not the death of a particular, known person, but "statistical death." "What is it worth," he asked (p. 127), to reduce the frequency of death—the statistical probability of death?"

After defining the question in these terms, Schelling (1968) next asked, "Worth to whom?" Now, Schelling was clearly addressing the problem of evaluating *public* investments (indeed, his essay was part of a conference and book volume dedicated to this topic). Although writing about public investments, he took the view that those investments should be evaluated in terms of the *private* worth they had to the *individuals* who would be affected (p. 127): "Worth to whom? . . . I shall propose that it is to the people who may die."

Elaborating on this point, Schelling addressed the oft-articulated view that life and death are moral—or at least intangible—matters that cannot be priced. Responding to Reynolds (1956), who had argued that it is beyond the competence of economists to assign values to pain, fear, and suffering, Schelling (1968, pp. 128–129) argued:

> The same is true of cola and Novocain . . . If they were not for sale it would be beyond our competence, as economists, to put an objective value on them, at least until we took the trouble to ask people. Death is indeed different from most consumer events, and its avoidance different from most commodities. . . . But people have been dying for as long as they have been living; and where life and death are concerned we are all consumers. We nearly all want our lives extended and are probably willing to pay for it. It is worth while to remind

[7] Economists remain interested in such decisions. Recently Greenstone, Ryan, and Yankovich (2014) have computed the willingness of soldiers to re-enlist in the US Army based on the hazards and compensation associated with specific duties.

> ourselves that the people whose lives may be saved should have something to say about the value of the enterprise and that we analysts, however detached, are not immortal ourselves.

In other words, consumers' sovereignty should reign when evaluating public investments: it is their preferences which count, not the preferences of public officials. Because it was recognized that individuals do make choices over risk, consumer sovereignty could be embraced by looking to choices over risk as the basis of social values. These exchange ratios can be observed, Schelling (1968) suggested, from either the price system itself or through surveys (pp. 142–43), both methods that were followed up on in the coming years (for example, Thaler and Rosen 1976; Jones-Lee 1976). While public policies would still have the effect of costing or saving lives in the population, from the individual's perspective, these effects were measured as risks, and that was what mattered for valuation.

Conclusion

Until Schelling's (1968) essay, the implicit perspective in discussions of valuing life for purposes of public investments was that of a public agency trading off lives for other goods. The question of individual risks to life and limb was restricted to individual decisions. Schelling brought these two contexts together by evaluating the public benefits as the sum of private benefits. In so doing, he essentially merged one perspective that thought in terms of lives with another that thought in terms of risks. Synthesizing the two perspectives, Schelling coined the term "statistical lives," as a way to capture both perspectives. This synthesis was critical because valuing lives was, as he put it, too "awesome" a problem, but valuing risks had not, up to that point, seemed relevant to many public investments. Schelling was still talking about lives, but a peculiar kind of lives—"statistical lives." This was a new coinage, but it would have had a familiar ring. For several decades, it had been common in journals of statistics, engineering, and economics to write about the "statistical life" of a product—how long a light bulb, for example, could be expected to live. Only in this case, consumers were not evaluating the lives of light bulbs, but of themselves.

Familiar or not, Schelling's (1968) synthesis was not necessarily appreciated by people working within each perspective. Initial comments on Schelling's essay were stunningly dismissive, criticizing Schelling for lacking a rigorous analysis of risk, on one hand, as well as for overlooking the existing value-of-life literature on the other (Bailey 1968; Fromm 1968). The economics and wider policy literature has continued to grapple with the distinction between lives and risks ever since: for examples of such discussion, see Broome (1978); the essays in Jones-Lee (1982), particularly Linnerooth (1982); and Heinzerling (2000). Given these interpretive debates within the policy community, it is not surprising that the value of statistical life concept would be confusing and controversial to the general public, as the senior death discount episode back in 2003 attested.

Accordingly, Cameron (2010) has called for "euthanizing" the term "value of a statistical life" and statistical lives as a unit of account. She argues that this unappealing term is a colossal failure of marketing. It misleads the public, who interpret "value" as intrinsic worth rather than a monetary measure, and who understandably interpret "lives" as just that, rather than risks. It is, after all, a lot to ask of the adjective "statistical" to not only modify the noun "life" but to transform it into "risk"! Inevitably, this conflation of the notion of "lives" and "risk" leads to misunderstanding and, in turn, to political controversy. Cameron suggests replacing the VSL terminology with "willingness to swap" money for "microrisks."

Thus, although Cameron (2010) may well be right to suggest that, as a term of art, "value of statistical life" is unnecessarily confusing to the public today, it made sense in Schelling's historical context. Indeed, it more than made sense. By bridging the gap between the value for *lives*, which was what seemingly was required for social benefit–cost analysis, and the value for *risks*, which was what consumers could reveal either through the market or through surveys, the VSL terminology was an appealing and persuasive way to make the case for introducing those values into benefit–cost analysis. In other words, conflating "lives" and "risks" may have been exactly what it took at the time for economists to persuade government officials and the public on the idea of pricing those policy impacts.

As Cameron (2010), Fourcade (2009), Viscusi (2009a,b), and others have discussed, economists' use of the value of statistical life in benefit–cost analysis often becomes tied up in ethical and political debates, in which economists are but one voice. But this was always so. Economists did not "discover" the idea of the VSL (or of estimating tradeoffs between money and risks) on their own. They were forced to consider the problem because of political pressure. Going back to 1949, when RAND economists had recommended the use of cheap propeller planes, the US Air Force objected to their answer and brought political pressure on RAND to change it. Recognizing that one reason they had come to the "wrong" answer was their ignoring the lives of bomber crews, RAND economists turned their attention to this problem of valuation of life, a problem that eventually attracted the attention of Schelling. Schelling's (1968) key rhetorical strategy, in turn, was to soothe fears about the awesomeness of valuing life by turning the terms of the debate, ever so subtly, to valuing risk. Judging by today's discussions, economists today may be ready to make that turn a little less subtle, but in doing so they are responding to broader political context in the same way they have always done.

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