

TWO CONCEPTIONS OF EMOTION IN RISK REGULATION

DAN M. KAHAN[†]

Recent work in cognitive and social psychology makes it clear that emotion plays a critical role in public perceptions of risk, but doesn't make clear exactly what that role is or why it matters. This Article examines two competing theories of risk perception, which generate two corresponding understandings of emotion and its significance for risk regulation. The "irrational weigher" theory asserts that laypersons' emotional apprehensions of risk are heuristic substitutes for more reflective judgments, and as such lead to systematic errors. It therefore counsels that risk regulation be assigned to politically insulated experts whose judgments are free of emotion's distorting impact. The "cultural evaluator" theory, in contrast, asserts that emotional apprehensions of risk reflect persons' expressive appraisals of putatively dangerous activities. It implies that emotional apprehensions of risk should at least sometimes be afforded normative weight in law and also generates distinctive strategies for reconciling sound risk regulation with genuinely participatory, democratic policymaking.

[†] Elizabeth K. Dollard Professor of Law, Yale Law School. Research for this paper was funded by The National Science Foundation (Grant SES 0621840) and by the Oscar M. Ruebhausen Fund at Yale Law School. I am grateful to Ellen Peters, Jeffrey Rachlinski, and Peter Schuck and to workshop participants at Temple Law School, Florida State University College of Law, and the "Law and Emotions: New Directions in Scholarship" conference at the Boalt Hall School of Law for their comments and suggestions.

I.	THREE THEORIES OF RISK PERCEPTION,	
	TWO CONCEPTIONS OF EMOTION	744
	A. <i>The Rational Weigher Theory: Emotion as Byproduct</i>	745
	B. <i>The Irrational Weigher Theory: Emotions as Bias</i>	746
	C. <i>The Cultural Evaluator Theory: Emotion</i> <i>as Expressive Perception</i>	748
II.	EMPIRICAL EVIDENCE	752
	A. <i>The Cognitive Priority of Emotion to Risk Perception</i>	752
	B. <i>The Effects of Emotion on Information Processing</i>	753
	C. <i>Emotion and Systematic Reasoning:</i> <i>Substitutes or Complements?</i>	757
III.	NORMATIVE AND PRESCRIPTIVE IMPLICATIONS	760
	A. <i>Expertise—Scientific and Moral</i>	760
	B. <i>On Education of the Emotions</i>	764
	CONCLUSION	766

Are emotions subversive of reason or essential constituents of it? Do they defeat realization of our ends by enfeebling our calculative faculties, inducing us to form deluded beliefs, and undermining our wills? Or do they perfect our rationality by supplying us with a capacity to perceive which states of affairs express our values, the motivation to pursue those conditions, and the power to imagine contingencies that threaten or advance them? These questions have long divided both philosophers and psychologists.¹ Competing answers contend with one another in law as well.²

¹ See generally JON ELSTER, *ALCHEMIES OF THE MIND: RATIONALITY AND THE EMOTIONS* 283-328 (1999) (canvassing positions on both sides); MARTHA C. NUSSBAUM, *THE THERAPY OF DESIRE: THEORY AND PRACTICE IN HELLENISTIC ETHICS* 79-96 (1994) (developing an Aristotelian rejoinder to the separation of emotion and reason); MICHAEL STOCKER WITH ELIZABETH HEGEMAN, *VALUING EMOTIONS* 91-121 (1996) (describing and attacking the position that sees emotion as opposed to reason).

² See, for example, James Madison's statement that:

As the cool and deliberate sense of the community ought, in all governments, and actually will, in all free governments, ultimately prevail over the views of its rulers; so there are particular moments in public affairs when the people, stimulated by some irregular passion, or some illicit advantage, or misled by the artful misrepresentations of interested men, may call for measures which they themselves will afterwards be the most ready to lament and condemn. In these critical moments, how salutary will be the interference of some temperate and respectable body of citizens, in order to check the misguided career and to suspend the blow meditated by the people against themselves, until reason, justice, and truth can regain their authority over the public mind?

THE FEDERALIST No. 63, at 371 (James Madison) (Isaac Kramnick ed., 1987). Contrast this with the following statement of Justice Brennan: "In our own time, attention to

Recent advances in the study of risk perception seem to furnish decisive evidence of emotion's antagonism to reason. A growing body of empirical research supplies compelling proof of the critical role that emotions play in the apprehension of personal and societal dangers.³ This role, according to the predominant understanding, is a heuristic one. Lacking access to sound empirical information, or the time and cognitive capacity to make sense of it, ordinary people conform their perceptions of risk to the visceral reactions that putatively dangerous activities evoke.⁴ These snap judgments might serve individuals better than nothing, the conventional account suggests. But they don't serve individuals nearly as well as the type of considered, reflective assessment for which they are a substitute. A substantial body of writing in the field of risk perception documents the numerous ways in which affect-driven risk appraisals lead ordinary people, and their popularly accountable representatives, to take positions inimical to society's well-being. The remedy, according to this work, is to shield law from the distorting influence of emotion, primarily by delegating regulatory power to politically insulated experts, who can evaluate the costs and benefits of asserted hazards (nuclear power, genetically modified foods, handguns, etc.) in a deliberate and reasoned fashion.⁵

My goal in this Article is to challenge this position. I don't mean to raise any question about the demonstrated centrality of emotions to risk perception, but only about the prevailing interpretation of it. The conclusion that emotional appraisals are *irrational* is integral, I'll argue, to a model of risk perception that sees the positions people take toward putatively dangerous activities as reflecting their implicit (and usually skewed) weighing of instrumental costs and benefits. I

experience may signal that the greatest threat to due process principles is formal reason severed from the insights of passion." William J. Brennan, Jr., *Reason, Passion, and "The Progress of the Law,"* 10 CARDOZO L. REV. 3, 17 (1988). See generally Dan M. Kahan & Martha C. Nussbaum, *Two Conceptions of Emotion in Criminal Law*, 96 COLUM. L. REV. 269 (1996) (exploring the disparate treatment of emotions and reason within criminal law).

³ See generally Paul Slovic et al., *Affect, Risk, and Decision Making*, 24 HEALTH PSYCHOL. S35 (supp. 2005) (examining recent developments in psychology and cognitive neuroscience regarding risk as feelings and its influence on decision making).

⁴ See George F. Loewenstein et al., *Risk as Feelings*, 127 PSYCHOL. BULL. 267, 280 (2001) ("[P]eople often experience a discrepancy between the fear they experience in connection with a particular risk and their cognitive evaluation of the threat posed by that risk.").

⁵ CASS R. SUNSTEIN, *LAWS OF FEAR: BEYOND THE PRECAUTIONARY PRINCIPLE* 126 (2005).

will lay emphasis instead on an account that sees risk perceptions as embodying individuals' cultural evaluations of the *meanings* expressed by society's decision to tolerate or abate particular risks.⁶ This model of risk perception, I'll argue, suggests that emotion functions not as a heuristic substitute for considered appraisals of information but rather as a perceptive faculty uniquely suited to discerning what stance toward risk best coheres with a person's values. Without the power this affective capacity supplies, it would be impossible for individuals to form *rational* cultural evaluations of risk. This account suggests that it would also be a mistake to seal off risk regulation from the influence of affect-driven risk appraisals or to assume that affect-driven appraisals cannot themselves be influenced by education and deliberation.

I will develop this argument in three steps. I will begin, in Part I, by describing three theories of risk perception, two of which treat emotion as essential to the cognition of risk. In Part II, I will canvass empirical findings that bear on these alternative understandings of how emotion contributes to risk perception. Finally, in Part III, I will examine what is at stake as a normative and prescriptive matter in the contest between these two conceptions of emotion in risk regulation.

I. THREE THEORIES OF RISK PERCEPTION, TWO CONCEPTIONS OF EMOTION

The profound impact of emotion on risk perception cannot be seriously disputed. Distinct emotional states—from fear to dread to anger to disgust⁷—and distinct emotional phenomena—from affective orientations to symbolic associations and imagery⁸—have been found to explain perceptions of the dangerousness of all manner of activities

⁶ See Dan M. Kahan et al., *Fear of Democracy: A Cultural Evaluation of Sunstein on Risk*, 119 HARV. L. REV. 1071, 1083-88 (2006) (reviewing SUNSTEIN, *supra* note 5) (discussing how cultural values shape risk perception).

⁷ See, e.g., PAUL SLOVIC, *THE PERCEPTION OF RISK* 117-18 (2000) (dread); Valerie Curtis & Adam Biran, *Dirt, Disgust, and Disease: Is Hygiene in Our Genes?*, 44 *PERSP. BIOLOGY & MED.* 17 (2001) (disgust); Ellen M. Peters et al., *An Emotion-Based Model of Risk Perception and Stigma Susceptibility: Cognitive Appraisals of Emotion, Affective Reactivity, Worldviews, and Risk Perceptions in the Generation of Technological Stigma*, 24 *RISK ANALYSIS* 1349 (2004) (fear and anger).

⁸ See generally Ellen Peters & Paul Slovic, *Affective Asynchrony and the Measurement of the Affective Attitude Component*, 21 *COGNITION & EMOTION* 300 (2007) (evaluating emotions as constructed through imagery or holistic evaluations).

and things—from pesticides⁹ to mobile phones,¹⁰ from red meat consumption¹¹ to cigarette smoking.¹²

More amenable to dispute, however, is exactly *why* emotions exert this influence. Obviously, emotions work in conjunction with more discrete mechanisms of cognition in some fashion. But which ones and how? To sharpen the assessment of the evidence that bears on these questions, I will now sketch out three alternative models of risk perception—the rational weigher, the irrational weigher, and the cultural evaluator theories—and their respective accounts of what (if anything) emotions contribute to the cognition of risk.

A. *The Rational Weigher Theory: Emotion as Byproduct*

Based on the premises of neoclassical economics, the *rational weigher theory* asserts that individuals, over time and in aggregate, process information about risky undertakings in a way that maximizes their expected utility. The decision whether to accept hazardous occupations in exchange for higher wages,¹³ to engage in unhealthy forms of recreation in exchange for hedonic pleasure,¹⁴ to accept intrusive

⁹ See Ali Siddiq Alhakami & Paul Slovic, *A Psychological Study of the Inverse Relationship Between Perceived Risk and Perceived Benefit*, 14 RISK ANALYSIS 1085, 1090-91 (1994) (revealing an inverse correlation between perceived risk and perceived benefit for several items, including pesticides).

¹⁰ See Michael Siegrist et al., *Perception of Mobile Phone and Base Station Risks*, 25 RISK ANALYSIS 1253 (2005).

¹¹ See Mariëtte Berndsen & Joop van der Pligt, *Risks of Meat: The Relative Impact of Cognitive, Affective and Moral Concerns*, 44 APPETITE 195, 203-04 (2005).

¹² See Slovic et al., *supra* note 3, at S39 (discussing affective impulses risk perception and the decision to smoke cigarettes).

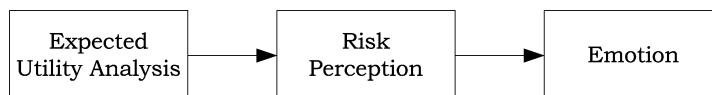
¹³ See, e.g., W. KIP VISCUSI, *RISK BY CHOICE: REGULATING HEALTH AND SAFETY IN THE WORKPLACE* 3 (1983) (“If workers understand the risks they face on hazardous jobs, they will demand additional compensation to take such jobs.”).

¹⁴ See, e.g., TOMAS J. PHILIPSON & RICHARD A. POSNER, *PRIVATE CHOICES AND PUBLIC HEALTH: THE AIDS EPIDEMIC IN AN ECONOMIC PERSPECTIVE* 4-10 (1993) (modeling the rational choice between safe and risky sexual activity); W. KIP VISCUSI, *SMOKE-FILLED ROOMS: A POSTMORTEM ON THE TOBACCO DEAL* 136 (2002) (finding that, despite assumptions to the contrary, “available evidence demonstrates that people are aware that smoking is in fact quite risky for one’s health”).

regulation to mitigate threats to national security¹⁵ or the environment,¹⁶ all turn on a utilitarian balancing of costs and benefits.

On this theory, emotions *don't* make any contribution to the cognition of risk. They enter into the process, if they do at all, only as reactive byproducts of individuals' processing of information: if a risk appears high relative to benefits, individuals will likely experience a negative emotion (perhaps fear, dread, or anger), whereas if the risk appears low, they will likely experience a positive one (such as hope or relief).¹⁷ This relationship is depicted as Figure 1.

Figure 1: The Rational Weigher Theory of Risk Perception



B. *The Irrational Weigher Theory: Emotions as Bias*

The *irrational weigher theory* asserts that individuals lack the capacity to process information that maximizes their expected utility. Because of constraints on information, time, and computational power, ordinary individuals must resort to heuristic substitutes for considered analysis; those heuristics, moreover, invariably cause individuals' evaluations of risks to err in substantial and recurring ways.¹⁸ Much of contemporary social psychology and behavioral economics has been dedicated to cataloging the myriad distortions—from the “availability

¹⁵ See, e.g., RICHARD A. POSNER, NOT A SUICIDE PACT: THE CONSTITUTION IN A TIME OF NATIONAL EMERGENCY 23-25 (2006) (arguing that the Supreme Court evaluates constitutional challenges to national security policies by weighing their costs and benefits).

¹⁶ See, e.g., RICHARD A. POSNER, CATASTROPHE: RISK AND RESPONSE 14 (2004) (advocating the use of cost-benefit analysis by regulators when shaping responses to catastrophic risk).

¹⁷ See Loewenstein et al., *supra* note 4, at 276-78 (discussing the impact of risk probability on emotions).

¹⁸ See generally Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1477-78 (1998) (explaining “bounded rationality,” which theorizes that even when aware of our own cognitive limitations, human behavior differs from that expected by entirely rational actors).

cascades”¹⁹ to “probability neglect”²⁰ to “overconfidence bias”²¹ to “status quo bias”²²—that systematically skew risk perceptions, particularly those of the lay public.

For the irrational weigher theory, the contribution that emotion makes to risk perception is, in the first instance, a heuristic one. Individuals rely on their visceral, affective reactions to compensate for the limits on their ability to engage in more considered assessments.²³ More specifically, irrational weigher theorists have identified emotion or affect as a central component of “System 1 reasoning,” which is “fast, automatic, effortless, associative, and often emotionally charged,”²⁴ as opposed to “System 2 reasoning,” which is “slower, serial, effortful, and deliberately controlled”²⁵ and typically involves “execution of learned rules.”²⁶ System 1 is clearly adaptive in the main—heuristic reasoning furnishes guidance when lack of time, information, and cognitive ability make more systematic forms of rea-

¹⁹ See, e.g., Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683 (1998) (analyzing the correlation between an idea’s perceived credibility and its availability in public discourse).

²⁰ See, e.g., Cass R. Sunstein, Essay, *Probability Neglect: Emotions, Worst Cases, and Law*, 112 YALE L.J. 61 (2002) (discussing the tendency to focus on the attributes of an emotionally charged negative outcome, rather than its likelihood).

²¹ See, e.g., Baruch Fischhoff et al., *Knowing with Certainty: The Appropriateness of Extreme Confidence*, 3 J. EXPERIMENTAL PSYCHOL.: HUMAN PERCEPTION & PERFORMANCE 552 (1977) (discussing the tendency to overestimate degrees of certainty).

²² See, e.g., Daniel Kahneman et al., *The Endowment Effect, Loss Aversion, and Status Quo Bias*, 5 J. ECON. PERSP. 193, 197-99 (1991) (discussing the tendency to prefer the current state of affairs, even in the face of advantageous alternatives).

²³ See Paul Slovic et al., *Risk as Analysis and Risk as Feelings: Some Thoughts About Affect, Reason, Risk, and Rationality*, 24 RISK ANALYSIS 311, 313-14 (2004) (“Although analysis is certainly important in some decision-making circumstances, reliance on affect and emotion is a quicker, easier, and more efficient way to navigate in a complex, uncertain, and sometimes dangerous world.”). See generally Loewenstein et al., *supra* note 4, at 269-70 (“Research on anxiety, for example, shows that emotional reactions to a risky situation often diverge from cognitive evaluations of risk severity.”).

²⁴ Daniel Kahneman, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, 93 AM. ECON. REV. 1449, 1451 (2003).

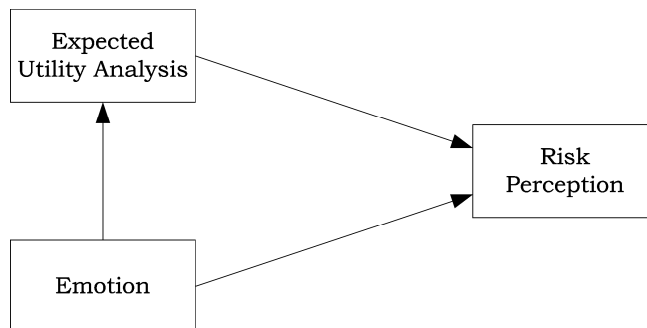
²⁵ *Id.*

²⁶ Shane Frederick, *Cognitive Reflection and Decision Making*, 19 J. ECON. PERSP. 25, 26 (2005). The “System 1”/“System 2” distinction is one of a family of “dual-process” reasoning theories that contrast heuristic reasoning, typically emotional in nature, with more systematic, deductive forms of reasoning. See generally Shelly Chaiken & Yaakov Trope, *Preface to DUAL-PROCESS THEORIES IN SOCIAL PSYCHOLOGY*, at ix, ix (Shelly Chaiken & Yaakov Trope eds., 1999) (introducing the distinction between “dual-process models”).

soning infeasible—but it remains obviously “error prone” in comparison to the more the “more deliberative [and] calculative” System 2.²⁷

Indeed, according to the irrational weigher theory, emotion-pervaded forms of heuristic reasoning can readily transmute into bias. The point isn’t merely that emotion-pervaded reasoning is less accurate than cooler, calculative reasoning; rather it’s that habitual submission to its emotional logic ultimately displaces reflective thinking, inducing “behavioral responses that depart from what individuals view as the best course of action”—or at least would view as best if their judgment were not impaired.²⁸ Proponents of this view have thus linked emotion to nearly all the cognitive biases shown to distort risk perceptions, as shown in Figure 2.²⁹

Figure 2: Irrational Weigher Theory of Risk Perception



C. *The Cultural Evaluator Theory: Emotion as Expressive Perception*

Finally there’s the *cultural evaluator theory* of risk perception. This model rests on a view of rational agency that sees individuals as concerned not merely with maximizing their welfare in some narrow consequentialist sense, but also with adopting stances toward states of af-

²⁷ SUNSTEIN, *supra* note 5, at 68.

²⁸ Loewenstein et al., *supra* note 4, at 271.

²⁹ See, e.g., SUNSTEIN, *supra* note 5, at 38-39, 41, 64 (explaining how availability effect, status quo bias, and probability neglect influence decision making); Loewenstein et al., *supra* note 4, at 271, 275-76 (detailing how overconfidence, vividness/availability, and insensitivity to probability affect perceptions of risk). But see discussion *infra* Part II.A-B (describing and critiquing the irrational weigher theory).

fairs that appropriately *express* the values that define their identities.³⁰ Often when an individual is assessing what position to take on a putatively dangerous activity, she is, on this account, not weighing (rationally or irrationally) her expected utility but rather evaluating the *social meaning* of that activity.³¹ Against the background of cultural norms (particularly contested ones), would the law's designation of that activity as inimical to society's well-being affirm her values or denigrate them?³²

Like the irrational weigher theory, the cultural evaluator theory treats emotions as entering into the cognition of risk. But it offers a very different account of how—one firmly aligned with the position that sees emotions as constituents of reason.

Martha Nussbaum describes emotions as “judgments of value.”³³ They orient a person who values some good, endowing her with the attitude that appropriately expresses her regard for that good in the face of a contingency that either threatens or advances it. On this account, for example, *grief* is the uniquely appropriate and accurate judgment for someone who values another who has died; *fear* is the appropriate and accurate judgment for someone who values her or another's well-being in the face of an impending threat to it; *anger* is the appropriate and accurate judgment for someone who values her own honor in response to an action that conveys insufficient respect. People who fail to experience these emotions under such circumstances—or who experience these or other emotions in circumstances that do not warrant them—lack a capacity of discernment essential to

³⁰ See generally ELIZABETH ANDERSON, *VALUE IN ETHICS AND ECONOMICS* (1993) (proposing a theory of rational action that defines such as action that “adequately expresses . . . rational attitudes toward people and other intrinsically valuable things”).

³¹ See generally Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943 (1995) (arguing that social meanings exist as a general societal backdrop and exert influence over action and decision making).

³² See generally Kahan et al., *supra* note 6, at 1087-88 (explaining that individuals conform their perceptions of an activity to “positive or negative social meanings,” which are governed by cultural norms).

³³ See MARTHA C. NUSSBAUM, *UPHEAVALS OF THOUGHT: THE INTELLIGENCE OF EMOTIONS* 19 (2001) (“Emotions . . . involve judgments about important things . . . in which, appraising an external object as salient for our own well-being, we acknowledge our own neediness and incompleteness before parts of the world that we do not fully control.”).

their flourishing as agents capable of holding values and pursuing them.³⁴

Rooted heavily in Aristotelian philosophy, Nussbaum's account is, as she herself points out,³⁵ amply grounded in modern empirical work in psychology and neuroscience. Antonio Damasio's influential "somatic marker" account, for example, identifies emotions with a particular area in the brain.³⁶ Persons who have suffered damage to that part of the brain display impaired capacity to recognize or imagine conditions that might affect goods they care about, and thus lack motivation to respond accordingly. They are perceived by others and often by themselves as mentally disabled in a distinctive way, as suffering from a profound kind of moral and social obtuseness that makes them incapable of engaging the world in a way that matches their own ends.³⁷ If *being* rational consists, at least in part, of "see[ing] which values [we] hold" and knowing how to "deploy these values in [our] judgments," then "those who are unaware of their emotions or of their emotional lacks" will necessarily be deficient in a capacity essential to being "a rational person."³⁸

The cultural evaluator theory views emotions as enabling individuals to perceive what stance toward risks coheres with their values. Cultural norms obviously play a role in shaping the emotional reactions people form toward activities such as nuclear power, handgun possession, homosexuality, and the like.³⁹ When people draw on their emotions to judge the risk that such an activity poses, they form an expressively rational attitude about what it would *mean* for their cul-

³⁴ See *id.* at 19-77 (explaining and defending the neo-Stoic view of emotions as judgment, which holds emotions are the second step in a two-step process by which people accept, reject, or ignore perceptions as accurate depictions of reality).

³⁵ See *id.* at 93-119 (summarizing the historical response to the study of emotions and more recent research in the fields of philosophy, psychology, and neuroscience); see also STOCKER WITH HEGEMAN, *supra* note 1, at 105-21 (linking the cultural evaluator theory to a myriad of sources, including psychoanalytic scholarship).

³⁶ See ANTONIO R. DAMASIO, DESCARTES' ERROR: EMOTION, REASON, AND THE HUMAN BRAIN 173-83 (1994) (discussing the way rational thoughts about bad outcomes are preceded by an "unpleasant gut feeling" produced by a neural system in the prefrontal cortex).

³⁷ See *id.* at 34-79 (detailing the case study of Elliot, a man whose emotions and personality changed due to a brain tumor compressing his frontal lobes upwards, indicating the connection between brain regions, reasoning, and decision making).

³⁸ STOCKER WITH HEGEMAN, *supra* note 1, at 105.

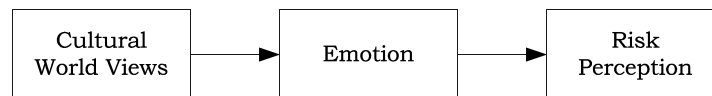
³⁹ See generally ELSTER, *supra* note 1, at 139-238 (discussing the historical development of various emotions' normative force); NUSSBAUM, *supra* note 33, at 139-44, 157-65 (outlining various culturally "appropriate" responses to death, and their manifestations and psychological underpinnings).

tural worldviews for society to credit the claim that that activity is dangerous and worthy of regulation, as depicted in Figure 3. Persons who subscribe to an egalitarian ethic, for example, have been shown to be particularly sensitive to environmental and technological risks, the recognition of which coheres with condemnation of commercial activities that generate distinctions in wealth and status. Persons who hold individualist values, in contrast, tend to dismiss concerns about global warming, nuclear waste disposal, food additives, and the like—an attitude that expresses their commitment to the autonomy of markets and other private orderings.⁴⁰ Individualistic persons worry instead about the risk that gun control—a policy that denigrates individualist values—will render law-abiding citizens defenseless.⁴¹ Persons who subscribe to hierarchical values worry about the dangers of drug distribution, homosexuality, and other forms of behavior that defy traditional norms.⁴²

⁴⁰ See, e.g., MARY DOUGLAS, *PURITY AND DANGER: AN ANALYSIS OF CONCEPTS OF POLLUTION AND TABOO* (1966) (explaining how various “primitive” and “advanced” civilizations have dealt with contagion and pollution); Karl Dake, *Orienting Dispositions in the Perception of Risk: An Analysis of Contemporary Worldviews and Cultural Biases*, 22 J. CROSS-CULTURAL PSYCHOL. 61 (1991) (analyzing the industrialized world’s response to risks and opportunities associated with technological development); Aaron Wildavsky & Karl Dake, *Theories of Risk Perception: Who Fears What and Why?*, 119 DAEDALUS 41, 44-45 (1990) (exploring various explanatory models for why certain groups fear technology while others revere it).

⁴¹ See generally Dan M. Kahan et al., *Culture and Identity-Protective Cognition: Explaining the White-Male Effect in Risk Perception*, 4 J. EMPIRICAL LEGAL STUD. 465, 474-75 (2007) (expanding on the theory that white men fear gun control because their hierarchical cultural orientation causes them to associate gun possession with the role of father and protector).

⁴² See Wildavsky & Dake, *supra* note 40, at 46 (“Due to the emphasis placed on obedience to authority within hierarchy, its supporters scorn deviant behavior.”); Dan M. Kahan et al., *The Second National Risk and Culture Study: Making Sense of—and Making Progress in—the American Culture War of Fact* 3-15 (George Wash. Univ. Legal Studies Research Paper No. 370), available at <http://ssrn.com/abstract=1017189> (exploring Americans’ views on several contemporary issues, including the “hierarchical” view on each); The Cultural Cognition Project at Yale Law School, *National Risk and Culture Survey*, <http://research.yale.edu/culturalcognition/index.php?option=content&task=view&id=45> (last visited Jan. 20, 2008) (“[A]n 1800-person national survey . . . found that cultural worldviews better predicted perceptions of various risks than did any other individual characteristic.”).

Figure 3: The Cultural Evaluator Theory of Risk Perception

This account of emotion doesn't see its function as a heuristic one. That is, emotions don't just enable a person to latch onto a position in the absence of time to acquire and reflect on information. Rather, as a distinctive faculty of cognition, emotions perform a unique role in enabling her to identify the stance that is expressively rational for someone with her commitments. Without the contribution that emotion makes to her powers of expressive perception, she would be lacking this vital incident of rational agency, no matter how much information, no matter how much time, and no matter how much computational acumen she possessed.

II. EMPIRICAL EVIDENCE

So far, I have outlined three theories of risk perception and the corresponding accounts of emotion they support. I now want to assess how well these theories fit the growing empirical literature on emotion and risk perception.

A. *The Cognitive Priority of Emotion to Risk Perception*

Among the most important empirical studies on emotion and risk perception are those that demonstrate the cognitive priority of the former. Rather than conform their emotional appraisals of a putatively dangerous activity (say, nuclear power generation) to their assessment of its risks, individuals conform their assessments of its risks to their emotional appraisals.⁴³

⁴³ See Alhakami & Slovic, *supra* note 9, at 1095 (finding affective evaluation to be a strong predictor of perceived risk and benefit); Melissa L. Finucane et al., *The Affect Heuristic in Judgments of Risks and Benefits*, 13 J. BEHAV. DECISION MAKING 1, 3 (2000) (proposing that individuals make judgments using associations with positive and negative affective feelings); Ellen M. Peters et al., *An Emotion-Based Model of Risk Perception and Stigma Susceptibility: Cognitive Appraisals of Emotion, Affective Reactivity, Worldviews, and Risk Perceptions in the Generation of Technological Stigma*, 24 RISK ANALYSIS 1349, 1350 (2004) ("[R]isk perceptions are primarily emotional phenomena with the emotions inextricably linked to how we think about technologies and what is communicated to us about those technologies."). See generally Loewenstein et al., *supra* note 4, at 270-71 (distinguishing the risk-as-feelings hypothesis from other theories proposing that

This finding weighs decisively against the rational weigher theory of risk perception. Because that theory assumes that individuals will rationally process information in a way that maximizes their expected utility, it doesn't supply any reason to believe that persons who have different emotional reactions toward an activity will form different factual beliefs about its risks and benefits.⁴⁴

The cognitive priority of emotion to risk perception *is* consistent, however, with the irrational weigher theory. Under that theory, emotions directly influence risk perceptions direction as a heuristic, System 1 substitute for more reflective System 2 reasoning, and indirectly as a distorting force on individuals' processing of information.

The cultural evaluator theory also asserts that emotion exerts a cognitive influence on risk perception—not by distorting the processing of information, but by enabling individuals to perceive which stance toward risk *rationality* expresses their cultural worldviews. Studies that tell us only that emotion is cognitively prior to risk perceptions, then, are equally compatible with both the cultural evaluator theory's conception of emotion as expressive perception and the irrational weigher theory's conception of emotion as bias.

B. *The Effects of Emotion on Information Processing*

Another class of studies purports to identify particular characteristics of individuals' risk perceptions that are plausibly viewed as evidence of the impact of emotion on information processing. Studies of this sort, however, also fail to resolve decisively the dispute between emotion as bias and emotion as expressive perception.

One feature of risk perception said to bear the signature of emotion is the unwillingness of individuals to adjust their decisions about the acceptability of risks to changes in information about their probability.⁴⁵ System 2 reasoning requires not only that people form unbiased assessments of the magnitude of risks and benefits, but also that they appropriately combine them to determine the expected utility of forgoing or forbearing them. That doesn't happen when people are

"emotions often produce behavioral responses that depart from what individuals view as the best course of action").

⁴⁴ See Loewenstein et al., *supra* note 4, at 267 (discussing the expected utility theory, which posits that individuals assess risk according to the severity and probability of possible outcomes before arriving at a decision using an expectation-based calculus).

⁴⁵ See Loewenstein et al., *supra* note 4, at 276-78 (providing an overview of studies suggesting insensitivity to probability variations).

emotional. Instead they fail to discount a potential harm by its improbability—the phenomenon of “probability neglect”—because “when intense emotions are engaged, people tend to focus on the adverse outcome, not on its likelihood.”⁴⁶ By the same token, when people “anticipate a loss of what [they] now have, [they] can become genuinely afraid, in a way that greatly exceeds [their] feelings of pleasurable anticipation when [they] look forward to some supplement to what [they] now have.”⁴⁷ The result is “status quo” bias, the disposition to refrain from action that entails some risks but that nonetheless has a positive expected value.⁴⁸ Alternatively, positive emotions—such as hope or pride—can lead to an “overconfidence bias” that induces people to underestimate risks associated with behavior they value.⁴⁹

But an alternative explanation, one in keeping with the cultural evaluator theory, is that individuals’ decisions to forgo or forbear risks is based not on the expected utility of those actions but on their social meanings, which are unlikely to be tied in any systematic way to the actuarial magnitude of those risks. The individualist, for example, who continues to worry more about being rendered defenseless than about being shot as the risks of insufficient gun control appear to increase⁵⁰ might “not so much [be] afraid of dying as afraid of death without honor.”⁵¹ Similarly, for the person who values an activity—say, smoking—precisely because she subscribes to an ethic that prizes the “authenticity of impulse and risk,” a cultivated disposition to discount the likelihood of personal harm may be integral to the very form of life that activity helps her to experience.⁵² For such persons,

⁴⁶ SUNSTEIN, *supra* note 5, at 64.

⁴⁷ *Id.* at 41.

⁴⁸ *Id.*

⁴⁹ See Loewenstein et al., *supra* note 4, at 271 (“Numerous studies have found that people in good moods make optimistic judgments and choices and that people in bad moods make pessimistic judgments and choices.”).

⁵⁰ See The Cultural Cognition Project at Yale Law School, What Matters More—Consequences or Meanings?, <http://research.yale.edu/culturalcognition/index.php?option=content&task=view&id=104> (last visited Jan. 20, 2008) (finding that 87% of study participants who oppose more gun control agreed that even if gun control greatly reduced crime, it would be wrong for the government to disallow law-abiding citizens from owning guns for self-protection).

⁵¹ MARY DOUGLAS & AARON WILDAVSKY, *RISK AND CULTURE: AN ESSAY ON THE SELECTION OF TECHNICAL AND ENVIRONMENTAL DANGERS* 6 (1982).

⁵² Joseph R. Gusfield, *The Social Symbolism of Smoking and Health*, in *SMOKING POLICY: LAW, POLITICS, AND CULTURE* 49, 66 (Robert L. Rabin & Stephen D. Sugarman eds., 1993).

moreover, the very idea of conforming their attitudes toward a risk to the results of a cost-benefit calculus might bear a meaning that denigrates their values.⁵³

Another feature of popular risk perceptions that is thought to reflect the biasing effect of emotion is the tendency of individuals' assessments of risks and benefits to be inversely correlated.⁵⁴ Rather than attend to information about a putatively dangerous activity in a deliberate and systematic fashion, it is said, individuals conform their assessments of all manner of information to their emotional appraisals, perhaps to avoid dissonance.⁵⁵ This is a plausible reading of the results of these studies. But so is the conclusion that individuals are forming (or, just as likely, reporting) the perceptions of *both* risks and benefits that best express their cultural evaluations of an activity. In that case, the inverse correlation between risks and benefits would reflect the *expressively rational* effect of cultural worldviews, and not the irrational impact of emotion, on information processing.

Another supposed sign of the influence of emotion on information processing is the responsiveness of individual risk perceptions to the *vividness* of information.⁵⁶ The irrational weigher theory treats this as further evidence that emotions warp reasoned analysis. Emotionally gripping depictions of harm (e.g., news coverage of a terrorist attack), it is said, are more salient than emotionally sterile ones (e.g., stories about the consequences of global warming).⁵⁷ Accordingly, they are more likely to be noticed and recalled, generating the distorted estimation of risks associated with the "availability effect."⁵⁸

But again the cultural evaluator model offers an alternative explanation that fits the data just as well, if not better. The impact of vivid information on risk perceptions is conditional on individuals' cultural

⁵³ See generally FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004) (advocating a holistic, values-based approach to risk regulation to contrast to a reductive cost-benefit analysis).

⁵⁴ See, e.g., Alhakami & Slovic, *supra* note 9, at 1085 (finding that this inverse relationship indicates the confounding of risk and benefit in people's minds, which is correlated to a person's assessment of an activity).

⁵⁵ See Loewenstein et al., *supra* note 4, at 271-72 (discussing the nature of emotional reactions to risk and their effects on behavior).

⁵⁶ See *id.* at 274-75 (discussing vividness as a variable that plays only a minor role in cognitive reactions, but a significant rule in emotional reactions).

⁵⁷ See Cass R. Sunstein, Essay, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 507 (2007).

⁵⁸ See *id.* at 535.

worldviews. Shown news of a school shooting spree, egalitarians and communitarians fix on the horrifying image of dead children and revise upward their assessment of the risks of private gun ownership. What captures the attention of hierarchical and individualistic persons, however, is the tragic inability of school personnel to cut the massacre short because they were forbidden by law to bring their own guns onto school premises—a dreaded outcome that causes them to revise upward their assessment of the risk of *gun control*.⁵⁹ Likewise, terrorism risks loom larger than global warming risks *only* in the imagination of hierarchs, not in the imagination of egalitarians—and in the mind of individualists, neither is particularly worrisome.⁶⁰ Because *all* persons of all cultural persuasions have a stake in forming an evaluation of the incident that appropriately expresses their values, there's no reason to view anyone's response to the vividness of the story as biased rather than rationally informed by emotion.

A similar conclusion can be drawn about one last feature of risk perceptions often presented as evidence of the biasing effect of emotion. This is the tendency of public risk perceptions to reinforce and feed on themselves. Irrational weigher theorists depict this phenomenon as a form of “hysteria” or “mass panic.”⁶¹ They link it to emotion by identifying the cause as “highly vivid cases . . . that receive concentrated media attention” resulting in a distorting “interplay between anxiety, fear, and subjective probabilities.”⁶²

The problem with this argument is that the power of social influence to amplify perceptions of risk is also known to be highly conditional on individuals' cultural orientations. The view that nuclear power is dangerous and that global warming is a serious threat is uniformly held by egalitarians, but almost uniformly rejected by hierarchs and individualists. Hierarchs have formed a perception that abortion is hazardous for women, but other groups have not. Egalitarians and

⁵⁹ See Kahan et al., *supra* note 42, at 7-8 (examining this phenomenon in the aftermath of the Virginia Tech massacre); see also Dan M. Kahan & Donald Braman, *More Statistics, Less Persuasion: A Cultural Theory of Gun-Risk Perceptions*, 151 U. PA. L. REV. 1291, 1314-15 (2003) (describing the interaction between the availability heuristic and cultural worldviews in assessing competing gun risks).

⁶⁰ See Kahan et al., *supra* note 42, at 4, 14 (examining cultural predispositions on global warming and terrorism risks).

⁶¹ See Kuran & Sunstein, *supra* note 19, at 748 (arguing for policy judgments made on the basis of “the best possible understanding of reality rather than mass hysteria”); SUNSTEIN, *supra* note 5, at 94-98 (discussing the spread of “moral panics” because of the cascading effects of social band wagons).

⁶² Loewenstein et al., *supra* note 4, at 279.

communitarians aren't worried that restrictions on firearms will increase the risk that violent criminals will engage in predation, but individualists are up in arms about it (as it were).

For the cultural evaluator theory, the culture-specificity of self-reinforcing risk perceptions is easy to explain. Individuals have a stake—a perfectly rational one, as people who care about meanings and not just about consequences—to form positions on risk that express their cultural values. That by itself generates a certain tendency toward uniformity of risk perceptions within groups of culturally like-minded persons. But insofar as one of the primary sources of information people have about the relationship between their values and a putatively dangerous activity is what persons who share their commitments think about it,⁶³ perceptions of danger naturally feed upon one another among persons who share cultural commitments.⁶⁴ This form of group polarization in risk perceptions, then, is another dynamic that can be explained consistently with the view that emotion is a form of expressive perception and not a cognitive bias.

C. *Emotion and Systematic Reasoning: Substitutes or Complements?*

The experiments I have examined to this point show that emotion matters for risk perception, but they don't address whether emotion is functioning as bias or as a form of expressive perception. A third type arguably does both.

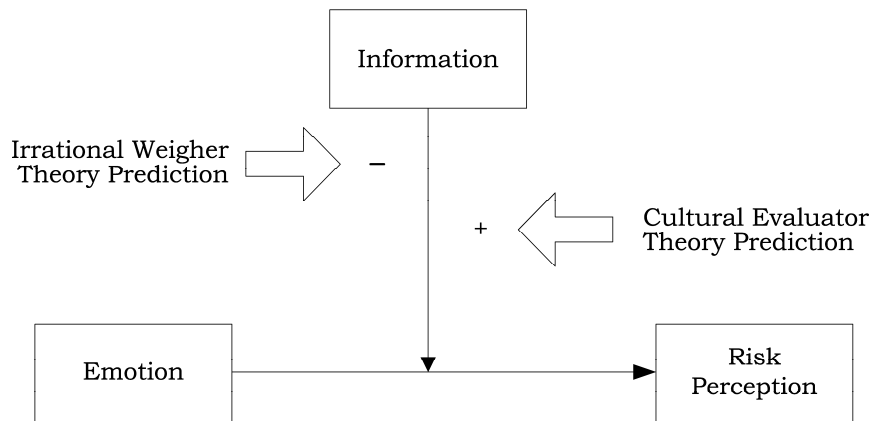
This research relates to how information and emotion interact. The irrational weigher theory treats emotion as an heuristic, System 1 substitute for more considered, System 2 information processing. It follows from this that the situation in which a person is likely to rely *most decisively* on emotion is when she must form an instantaneous judgment about a risk about which she has little or no information. As people obtain more information on, and have more time to reflect about, a novel risk, their judgments should be less affective or emotional. In this sense, then, the irrational weigher theory hypothesizes a negative interaction between information and emotion.

⁶³ See Geoffrey L. Cohen, *Party over Policy: The Dominating Impact of Group Influence on Political Beliefs*, 85 J. PERSONALITY & SOC. PSYCHOL. 808 (2003).

⁶⁴ See Donald Braman, Dan M. Kahan & James Grimmelmann, *Modeling Facts, Culture, and Cognition in the Gun Debate*, 18 SOC. JUST. RES. 283, 285 (2005) ("Through an overlapping set of psychological and social mechanisms, individuals adopt the factual beliefs that are dominant among persons who share their cultural orientations.").

The cultural evaluator theory suggests something different. According to that theory, emotion enables a person to form an attitude about risk that appropriately expresses her values. Emotion can't reliably perform that function, however, if a person lacks sufficient information to form a coherent judgment about whether crediting it would affirm or denigrate her worldview. On this account, then, emotion can be expected to play a *bigger* role in the judgment of someone who has had access to information and time to reflect on a relatively novel risk than someone who has not. In this sense, the cultural evaluator theory predicts a positive interaction between information and emotional perception of risk.

Figure 4: Hypothesized Interactions of Information and Emotion

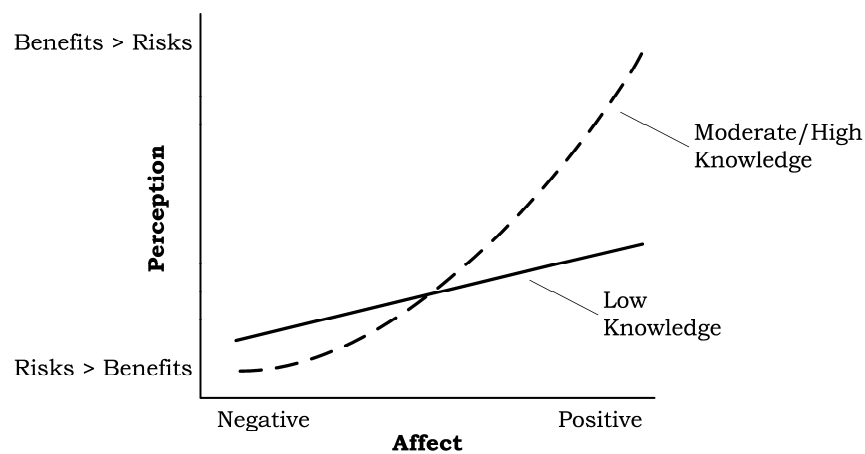


Paul Slovic, Don Braman, Geoff Cohen, John Gastil, and I conducted an experiment to test these competing hypotheses.⁶⁵ We assessed people's perceptions of the risks of nanotechnology. As we expected, the vast majority of our subjects—about 80%—had heard either “little” or “nothing” about this technology before we conducted our study. Nevertheless, close to 90% had an opinion on whether nanotechnology's potential risks would outweigh its potential benefits. Not surprisingly, their affective responses to nanotechnology exerted

⁶⁵ The nature of the study and the results are analyzed fully in Dan M. Kahan, Paul Slovic, Donald Braman, John Gastil & Geoffrey L. Cohen, *Affect, Values, and Nanotechnology Risk Perceptions: An Experimental Investigation* (George Wash. Univ. Law Sch. Pub. Law Research Paper No. 261, 2007), available at <http://ssrn.com/abstract=968652>.

a strong influence on their perceptions. But consistent with the prediction of the cultural evaluator theory, and inconsistent with that of the irrational weigher theory, the impact of affect relative to other influences (such as gender, race, or ideology) was significantly *larger* among persons who knew a modest or substantial amount about nanotechnology before the study. Likewise, we found that affect, as well as cultural worldviews, played an even bigger role in explaining variation among subjects who received information about nanotechnology before their views were elicited than in those who did not receive information first. Again, these findings suggest that emotion is not a heuristic substitute for information, but rather a type of evaluative judgment that depends on access to enough information for a person to evaluate the social meaning of a putatively dangerous activity.

Figure 5: Differential Impact of Affect on Nanotechnology Risk Perceptions Based on Prior Knowledge



Is this study conclusive in the contest between “emotion as bias” and “emotion as expressive perception”? Definitely not. But as the only study that puts the two squarely in conflict, it underscores the importance of resisting the fallacious inference that because emotion does not perform the role assigned to it by the (discredited) rational weigher model, the function it performs must be an irrational one.

III. NORMATIVE AND PRESCRIPTIVE IMPLICATIONS

Only the conceptions of emotion associated with the irrational weigher theory and the cultural evaluator theory fit the data on the relationship between emotion and risk perception. I now want to consider what is at stake as a practical matter in the conflict between them. Whether we see emotion as bias or expressive perception, I will argue, has immense normative and prescriptive implications for risk regulation.

A. *Expertise—Scientific and Moral*

The normative program associated with the irrational weigher theory has two adversaries. One is a largely anti-interventionist stance that counsels that market forces be trusted to set appropriate levels of risk absent manifest externalities, which themselves should be remedied through regulations that “mimic” the risk-benefit tradeoffs reflected in well-functioning markets.⁶⁶ If, as the irrational weigher theory asserts, emotions pervade and distort popular beliefs about risk, then there is little reason to assume that the decisions people make about their own welfare furnish a reliable guide for regulation.⁶⁷ The other adversary is a fundamentally “populist” regime that favors reliance on highly participatory democratic processes to identify appropriate levels of risk. That strategy, according to irrational weighers, assures convulsive regulatory responsiveness to the alternating currents of myopia and hysteria that animate popular risk perceptions.⁶⁸

⁶⁶ See, e.g., VISCUSI, *supra* note 13, at 114-35 (describing how to set health regulatory policy by balancing the cost to firms of compliance with the risk of noncompliance); John Martin Gillroy, *Environmental Risk and the Traditional Sector Approach: Market Efficiency at the Core of Environmental Law?*, 10 RISK 139, 145 (1999) (“When the collective goods nature of public policy problems causes market failures and the true price of an item is not reflected in its market value, then the role of the government in an efficiency-based regime, is to mimic the market and allocate accordingly, maximizing social benefit over cost.” (emphasis omitted)).

⁶⁷ See, e.g., George A. Akerlof & William T. Dickens, *The Economic Consequences of Cognitive Dissonance*, 72 AM. ECON. REV. 307 (1982) (challenging Viscusi’s “risk premium” theory of wages and safety precautions by using evidence of cognitive dissonance to show that people do not always behave the way economists assume they will).

⁶⁸ See STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION* 33-51 (1993) (analyzing data displaying the difference between the public’s actual perception of risk and expert projections); SUNSTEIN, *supra* note 5, at 25-26 (discussing the popular view of risk and its disparity from the purely economic view).

In place of these approaches, the irrational weigher theory advocates delegation of regulatory authority to politically insulated, scientifically trained risk experts. These individuals, it is said, have the information and technical acumen necessary to engage in reflective, System 2 reasoning, free of the biasing effects of emotion. By installing experts in independent regulatory agencies with which politicians cannot (easily) interfere and to which courts are obliged to defer, the law inoculates them from the virus of public irrationality.

Contrary to the objections of the defenders of the pro-market and populist strategies, moreover, irrational weigher theorists argue that this essentially depoliticized mechanism for intervening in private decision making need not be viewed as disrespectful of either individual freedom or self-government. Since ordinary people presumably would disown beliefs that are the product of emotional irrationality, regulating them via standards set by independent experts instead conforms their conduct to the preferences they would hold, as individuals and as a society, if they had the cognitive capacity to form considered and rational beliefs. “When people’s fears lead them in the wrong directions,” Sunstein explains, this form of “libertarian paternalism can provide a valuable corrective.”⁶⁹

The cultural evaluator theory suggests a strong critique of this defense of virtual-representation-by-risk-expert. According to the cultural evaluator model, most of the phenomena that the irrational weigher theory attributes to emotionally biased decision making in fact reflects the use of emotion to form expressively rational stances toward risk. If individuals’ factual beliefs *are* expressive of cultural worldviews, then experts who treat those beliefs as “blunders” unentitled to normative respect in a “deliberative democracy”⁷⁰ are necessarily shielding regulatory law from citizens’ visions of the good society. In fact, it is quite debatable whether risk experts’ judgments are as impervious to emotion as irrational weigher theorists believe.⁷¹ But however much more they know than ordinary members of the public about the actuarial magnitudes of various risks, the scientific experts

⁶⁹ SUNSTEIN, *supra* note 5, at 7.

⁷⁰ *Id.* at 126, 1.

⁷¹ See SLOVIC, *supra* note 7, at 409 (describing data suggesting that “affective and sociopolitical factors appear to influence scientists’ risk evaluations in much the same way as they influence the public’s perceptions”).

certainly possess no special insight on the cultural values society's laws should express.⁷²

It is exactly this mismatch between the sort of technical expertise possessed by risk experts and the *emotional* expertise needed to connect stances toward risk to citizens' values that informs unease toward "cost-benefit" and related welfarist modes of policymaking.⁷³ It's not impossible to imagine the law being coherently informed by such methods. What *is* impossible to imagine, though, is that the policies will adequately engage the difficult expressive questions that risk conflicts inevitably present. If part of what's troubling (to some) about nuclear power is what it would *say* about our values to leave to future generations the problem of dealing with ever-accumulating and forever-toxic wastes, then how does it help to treat the likelihood that future generations will in fact find a solution as just another variable in the cost-benefit calculus? If part of what disturbs (some) people about gun control is the condition of servility it expresses to cede protection of themselves and their families exclusively to the state, how responsive is it to print out a regression analysis that shows more lives are saved on net than are lost when handguns are banned? A form of policymaking that deliberately *excluded* the expressive insight uniquely associated with emotional perception would leave a society in a morally disabled posture analogous to the state of impairment experienced by the emotion-free individuals Damasio describes.⁷⁴

Nevertheless, this objection to deferring to scientific risk experts does not commit the cultural evaluator theory to either the pro-market or populist programs of risk regulation. Recognizing that emotions enable persons to perceive expressive value doesn't imply that the insight it imparts can never be challenged.⁷⁵ Indeed, the idea that emotions express cognitive evaluations is historically conjoined to the position that emotions can and should be evaluated as true or

⁷² See generally DOUGLAS & WILDAVSKY, *supra* note 51, at 80-81 ("Science and risk assessment cannot tell us what we need to know about threats of danger since they explicitly try to exclude moral ideas about the good life. Where responsibility starts, they stop.").

⁷³ See, e.g., ACKERMAN & HEINZERLING, *supra* note 53, at 11 (rejecting expert "economic thinking" in policymaking for a more "holistic" approach that restores a "sense of moral urgency to the protection of life, health, and the environment").

⁷⁴ See DAMASIO, *supra* note 36, at 205-22 (describing results from studies on "emotion-free" patients who suffered damage to their "somatic markers").

⁷⁵ See NUSSBAUM, *supra* note 33, at 47 (challenging the value assumptions in human emotion).

false, right or wrong, reasonable or unreasonable, in light of the moral correctness of the values those emotions express.⁷⁶

When we appreciate the expressive contribution that emotions make to risk perception, we are equipped to discern issues of justice that never come into focus under welfarist styles of risk assessment. Should a person about to be operated on be entitled to information about the risk that he could contract HIV from an infected surgeon?⁷⁷ Why not, if we think of the decision as reflecting only the interest a prospective patient has in calculating the costs and benefits of her treatment options? But what should our answer be if we know that fear of this risk—at least in those who placidly tolerate many larger risks incident to surgery—expresses commitment to a hierarchical worldview that condemns forms of deviance symbolically associated with AIDS?⁷⁸ Is it appropriate for a legislature to limit access to guns in order to avoid the risk of shooting accidents or violent crime? The question is at least a more complicated one if we recognize that part of what motivates aversion to these risks is an egalitarian and communitarian cultural style that despises the individualistic connotations of private gun ownership.⁷⁹

Analogous, and equally difficult, questions arise in other areas of law in which emotions figure.⁸⁰ No set of procedures or doctrines, in my view, can ever assure that these issues will be resolved in a just way.

But the normative complexity that the cultural evaluator theory injects into risk regulation is by no means a reason to shy away from it. For if emotion does indeed figure in our risk perceptions in the way that that theory implies, we would certainly be fools not to recognize how dependent risk regulation is on moral, as well as scientific, expertise.

⁷⁶ See Kahan & Nussbaum, *supra* note 2, at 286-87 (setting forth the ways that emotion can be evaluated as inappropriate).

⁷⁷ See generally Phillip L. McIntosh, *When the Surgeon Has HIV: What To Tell Patients About the Risk of Exposure and the Risk of Transmission*, 44 U. KAN. L. REV. 315 (1996) (exploring the legal considerations and risk assessments in deciding whether to disclose a physician's HIV infection).

⁷⁸ See Kahan et al., *supra* note 6, at 1087 (describing data supporting the conclusion that "hierarchists" worry more than "individualists" about contracting HIV).

⁷⁹ See Dan M. Kahan, *The Cognitively Illiberal State*, 60 STAN. L. REV. 115, 134-36 (2007) (connecting the perception of handgun risks to a partisan cultural worldview).

⁸⁰ See Kahan & Nussbaum, *supra* note 2, at 362-72 (discussing the emotional responses of judges and juries deciding manslaughter cases).

B. *On Education of the Emotions*

Even if risk regulation is not *just* about promoting societal welfare measured in instrumental terms, it is still *significantly* about that. As divided as they might be in their interests in what the law *says*, hierarchists and egalitarians, individualists and communitarians surely have a common interest in what the law *does* to secure them from environmental catastrophe, from disease, from market collapse, and from attacks upon the nation's security. What do the two conceptions of emotion in risk perception imply about the prospects for making the law responsive to the best scientific knowledge we have on how to achieve these ends?

The irrational weigher theory's message is a discouraging one. Trying to educate citizens, according to proponents of this view, is even worse than futile. Not only do citizens lack the time and capacity to engage scientifically complex data on risk in a considered, dispassionate way, but precisely because they don't, exposing them even to empirically sound information will often do more harm than good:

Government is unlikely to be successful if it simply emphasizes the low probability that [a feared] risk will come to fruition. The best approach may well be this: *Change the subject*. . . . [D]iscussions of low-probability risks tend to heighten public concern, even if those discussions consist largely of reassurance. Perhaps the most effective way of reducing fear of a low-probability risk is simply to discuss something else and to let time do the rest.⁸¹

The cultural evaluator theory, however, generates a more optimistic conclusion. Historically, the view that emotions are "judgments of value" has also been affiliated with the position that emotions can be educated. The type of instruction this approach contemplates, however, consists not in a stoic program of disciplining the mind and strengthening the will to resist the supposedly corrupting influence of emotion on judgment. Instead, it has involved a species of *moral* instruction that reforms a person's emotional apprehension of the social meanings that unjust or destructive states of affairs and courses of action express.⁸²

Emotional evaluations of risk are likewise subject to education. As the nanotechnology study shows, individuals' emotions *are* responsive

⁸¹ SUNSTEIN, *supra* note 5, at 125.

⁸² See NUSSBAUM, *supra* note 33, at 218-20, 233, 425-35 (exploring the methods and impact of moral education); Kahan & Nussbaum, *supra* note 2, at 297-301 (contrasting mechanistic and evaluative views of moral education).

to information. What individuals' emotions respond to as they learn more, however, is not the expected utility of forgoing or forbearing particular risks, but rather the social meaning of doing so. The prospects for making members of the public receptive to sound empirical information, then, doesn't depend on whether they can be trained *not* to apprehend risk through their emotions; it depends on whether scientifically sound information can be made to bear a social meaning that fits citizens' cultural values.

As I have discussed elsewhere,⁸³ the cultural evaluator theory suggests that this objective can be achieved through a risk-communication strategy that employs *cultural identity affirmation* and *expressive overdetermination*. In effect, individuals are cognitively motivated to reject information about risk when they perceive that accepting it would threaten their defining group commitments. To avoid this reaction, then, information about risks must be framed in a way that *affirms* rather than denigrates recipients' cultural identities; to make it possible for persons of diverse cultural persuasions to experience that affirmation simultaneously—and thus reach consensus on a contested risk issue—the information must be framed in a way that expresses a *plurality* of social meanings.

There are many examples of this type of strategy in action. The adoption of tradable emissions—a market mechanism for controlling pollution—made it possible for individualists, hierarchists, egalitarians, and communitarians to accept information about effective policies for securing clean air. The proposal to use nuclear power to reduce reliance on fossil fuel energy sources responsible for global warming is making hierarchists and individualists more receptive to information about the seriousness of climate change and egalitarians and communitarians more receptive to information about the feasibility of safely producing nuclear energy.⁸⁴ Donald Braman and I have proposed policies that use identity affirmation and expressive overdetermination to help contending cultural groups converge on sound information about gun risks.⁸⁵

⁸³ See Kahan et al., *supra* note 6, at 1096-1100 (defining and defending cultural identity affirmation); Kahan, *supra* note 79, at 145-53 (defining and defending the strategy of expressive overdetermination for reducing cultural conflict).

⁸⁴ See Kahan et al., *supra* note 42, at 4-6 (describing experimental results showing this effect).

⁸⁵ See Donald Braman & Dan M. Kahan, *Overcoming the Fear of Guns, the Fear of Gun Control, and the Fear of Cultural Politics: Constructing a Better Gun Debate*, 55 EMORY L.J. 569, 588-95 (2006) (describing an example of the successful use of identity affirmation

Whether a program of “deliberative risk communication” of this type can succeed is admittedly an open question. But because it offers the only serious hope for making the complex task of risk regulation amenable to meaningful self-government, the risk of its failure is well worth taking.

CONCLUSION

In this Article, I have examined both the growing evidence on emotions and risk perception and how that evidence should be interpreted. It is settled at this point that emotions play a critical role in the cognition of risk, a finding that further undermines the already tenuous foundations of the classic, “rational weigher” theory of risk perception. But commentators, I have argued, have been much too quick to infer that emotions therefore contribute to the deformation of public risk perceptions asserted by the now dominant “irrational weigher” theory. Another conception of emotion—not as bias but as expressive perception—fits the evidence just as well (indeed, perhaps even better). On this account, emotions play a critical role in perfecting the function that risk perceptions play as rational expressions of value under the emerging cultural evaluator theory.

The recent literature on the role of emotion in risk perceptions, then, has not resolved the classic debate on the relationship between emotion and reason. It has only moved that debate to a new location, one in which the stakes are incredibly high. An error in one direction could compromise our society’s safety and welfare. But an error in the other could just as easily cost the public a meaningful voice in deciding how our society should address the major issues of our time.

We should proceed with an open mind in our continued investigation of what emotion contributes to risk perception and what its significance is for risk regulation. But we ought to be motivated as well by a morally discerning fear of all we stand to lose if we reach the wrong conclusion.

and expressive overdetermination to resolve a dispute between Native American groups and the scientific community).