

in press, Handbook of Risk Theory (Springer Publishing, S. Roeser, ed.)
direct comments to dan.kahan@yale.edu

Cultural Cognition as a Conception of the Cultural Theory of Risk

*Dan M. Kahan**

Cultural cognition is one of a variety of approaches designed to empirically test the “cultural theory of risk” set forth by Mary Douglas and Aaron Wildavsky. The basic premise of cultural theory is that individuals can be expected to form beliefs about societal dangers that reflect and reinforce their commitments to one or another idealized form of social ordering. Among the features of cultural cognition that make it distinctive among conceptions of cultural theory are its approach to measuring individuals’ cultural worldviews; its empirical investigation of the social psychological mechanisms that connect individuals’ risk perceptions to their cultural worldviews; and its practical goal of enabling self-conscious management of popular risk perceptions in the interest of promoting scientifically sound public policies that are congenial to persons of diverse outlooks.

1. Introduction

This entry examines two related frameworks for the study of popular risk perceptions: the *cultural theory* of risk, associated with the work of Mary Douglas and Aaron Wildavsky (1982); and the *cultural cognition* of risk, a focus of recent work by various researchers including myself. I will present the latter as a conception of the former. The motivation for characterizing cultural cognition as a “conception” of cultural theory is two-fold: first, to supply an expositional framework for cultural cognition, the concepts and methods of which were formed to empirically test cultural theory; and second, to emphasize that cultural cognition is only one of a variety of competing approaches for interpreting and testing Douglas and Wildavsky’s influential claims about the nature of risk perception.

Indeed, one premise of this entry is that the answer to the question whether cultural cognition supplies a “correct” understanding of cultural theory, if not entirely unimportant, ultimately has no bear-

* [Elizabeth K. Dollard Professor of Law, Yale Law School](#). Research described herein was supported by the National Science Foundation (Grants SES-0621840 & SES-0242106) and the Oscar M. Ruebhausen Fund at Yale Law School.

ing on whether cultural cognition helps to make sense of individual differences in risk perception. Accordingly, whatever objections one might make to cultural cognition in the name of a particular rendering of Douglas and Wildavsky's theory does not detract from the explanatory and predictive (and ultimately prescriptive) utility of cultural cognition. Of course, if cultural cognition does a better job than other attempts to operationalize the cultural theory of risk, one might reasonably count this feature of it as one ground to prefer it to other constructs that arguably fit better with some set of theory-derived criteria but that do not, as an empirical matter, conform to the phenomena cultural theory is meant to explain.

There are three features of cultural cognition, I submit, that are distinctive among the various conceptions of cultural theory. One is the way in which cultural cognition *measures* cultural worldviews, which are the primary explanatory variable in the Douglas-Wildavsky account of risk perceptions. Another is the attention that cultural cognition gives to the mechanisms—social and psychological—that explain how culture shapes individuals' beliefs about risk. And the third is the practical objective of cultural cognition to promote collective management of public perceptions of risk and the effect of policies for mitigating them.

The entry elaborates on these points. Part 2 starts with an overview of cultural theory—a very spare one, which will be filled in over the course of later parts but which suffices to set the exposition in motion. Part 3 will take up the measurement of worldviews, contrasting the methods that I and my collaborators in the Cultural Cognition Project use with those used by other scholars who have tried to test cultural theory empirically. Part 4 addresses the distinctive focus of cultural cognition on psychological mechanisms. I'll identify how this feature of cultural cognition does admittedly put it in conflict with an important feature of Douglas and Wildavsky's own view of their theory. But I'll also survey some key empirical findings that cultural cognition has generated by adding psychological mechanisms to cultural theory. And finally, Part 5 will conclude with an assessment of how cultural cognition seeks to enable collective management of the role that culture plays in risk perception, a normative objective that might well strike orthodox cultural theorists as puzzling.

2. The Cultural Theory of Risk, in Broad Strokes

Cultural theory asserts that individuals should be expected to form perceptions of risk that reflect and reinforce their commitment to one or another “cultural way of life” (Thompson, Ellis & Wildavsky 1990). The theory uses a scheme that characterizes cultural ways of life and supporting worldviews along two cross-cutting dimensions (Figure 1), which Douglas calls “group” and “grid” (Douglas, 1970; 1982). A “weak” group way of life inclines people toward an individualistic worldview, highly “competitive” in nature, in which people are expected to “fend for themselves” without collective assistance or interference (Rayner, 1992, p. 87). In a “strong” group way of life, in contrast, people “interact frequently in a wide range of activities” in which they “depend on one another” to achieve their ends. This mode of social organization “promotes values of solidarity rather than the competitiveness of weak group” (*ibid.*, p. 87).

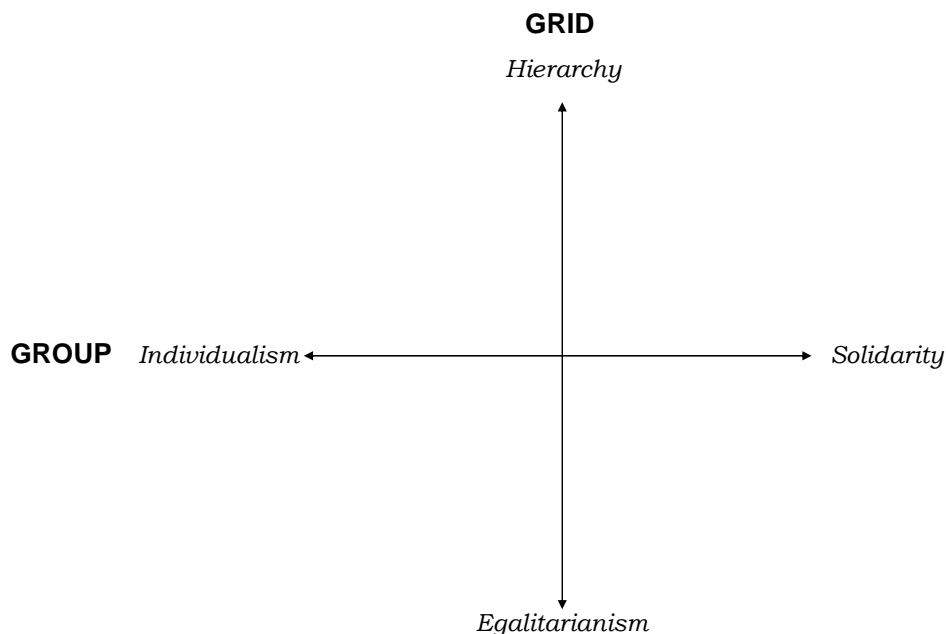


Figure 1. Douglas’s “group-grid” scheme. “Group” and “grid” delineate orthogonal dimensions of social organization, or “ways of life,” and supportive values or “worldviews.”

A “high” grid way of life organizes itself through pervasive and stratified “role differentiation” (Gross & Rayner 1985, p. 6). Goods and offices, duties and entitlements, are all “distributed on the basis of explicit public social classifications such as sex, color, . . . a bureaucratic office, descent in a senior

clan or lineage, or point of progression through an age-grade system” (*ibid*, p. 6). It thus conduces to a “hierarchic” worldview that disposes people to “devote a great deal of attention to maintaining” the rank-based “constraints” that underwrite “their own position and interests” (Rayner 1990, p. 87).

Finally, a low grid way of life consists of an “egalitarian state of affairs in which no one is prevented from participation in any social role because he or she is the wrong sex, or is too old, or does not have the right family connections” (Rayner 1990, p. 87). It generates and is supported by a correspondingly egalitarian worldview that emphatically denies that goods and offices, duties and entitlements, should be distributed on the basis of such rankings.

The cultural theory of risk makes two basic claims about the relationship between cultural “ways of life” so defined and risk perceptions. The first is that discrete constellations of perceived risk tend to cohere better with one or another way of life. Forms of conduct understood to inflict collective harm invite restriction, and the people who engage in such behavior censure and blame (Douglas 1992). It thus secures a way of life when its members come to see those who deviate from its norms as exposing the group to risk, in which case “the belief that the innocent are in danger helps to brand the delinquent and to rouse moral fervour against him” (Douglas 1966, p. 134). By the same token, it threatens a way of life, and the authority of those who hold positions of high status within it, to identify its signature forms of behavior as courting collective injury (Douglas & Wildavsky 1982).

The second claim of cultural theory is that individuals gravitate toward perceptions of risk that advance the way of life to which they are committed. “[M]oral concern guides not just response to the risk but the basic faculty of [risk] perception” (Douglas, 1985, p. 60). Each way of life and associated worldview “has its own typical risk portfolio,” which “shuts out perception of some dangers and highlights others,” in manners that selectively concentrate censure on activities that subvert its norms and deflect it away from activities integral to sustaining them (Douglas & Wildavsky 1982, pp. 8, 85). Because ways of life dispose their adherents selectively to perceive risks in this fashion, disputes about risk, Douglas and Wildavsky argue, are in essence parts of an “ongoing debate about the ideal society” (*ibid*, p. 36).

The paradigmatic case, for Douglas and Wildavsky, is environmental risk perception. Persons disposed toward the individualistic worldview supportive of a weak group way of life should, on this account, be disposed to react very dismissively to claims of environmental and technological risk because they recognize (how or why exactly is a matter to consider presently) that the crediting of those claims would lead to restrictions on commerce and industry, forms of behavior they like. The same orientation toward environmental risk should be expected for individuals who adhere to the hierarchical worldview, who see assertions of such danger as implicit indictments of the competence and authority of societal elites. Individuals who tend toward the egalitarian and solidaristic worldview characteristic of strong group and low grid, in contrast, dislike commerce and industry, which they see as sources of unjust social disparities, and as symbols of noxious self-seeking. They therefore find it congenial to credit claims that those activities are harmful—a conclusion that does indeed support censure of those who engage in them and restriction of their signature forms of behavior (Wildavsky & Dake 1990; Thompson, Ellis, & Wildavsky 1990).

This was the plot of Douglas and Wildavsky's classic *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers* (1982). The relationship that Douglas and Wildavsky asserted there between risk perceptions and the various ways of life featured in group-grid has animated nearly two decades' worth of empirical research aimed at testing the cultural theory of risk.

3. Measuring Worldviews

One of central methodological issues in the empirical research inspired by Douglas and Wildavsky's cultural theory is how to measure cultural worldviews. The approach cultural cognition takes toward this task is one of the things that distinguishes it from other conceptions of cultural theory.

3.1. Dake and His Successors

The dominant approach to measuring cultural worldviews can be traced back to Karl Dake, who (along with Wildavsky, his Ph.D. dissertation advisor) published the first empirical studies of culture theory in the early 1990s (Dake 1990, 1991; Wildavsky & Dake 1990). The basis of these studies was a

pair of public opinion surveys of residents of San Francisco and Oakland, California. Although the survey instrument was not designed specifically to test cultural theory, Dake was able to use various items from it to construct measures for doing so. Thus, from items relating to respondents' political attitudes, Dake formed separate scales for "Hierarchy," "Egalitarianism," and "Individualism." In subsequent work (Dake 1992), he identified a fourth set of items to represent a "fatalist" worldview, and thereafter identified the four scales with the quadrants demarcated by the intersection of "group" and "grid" (Figure 2).¹

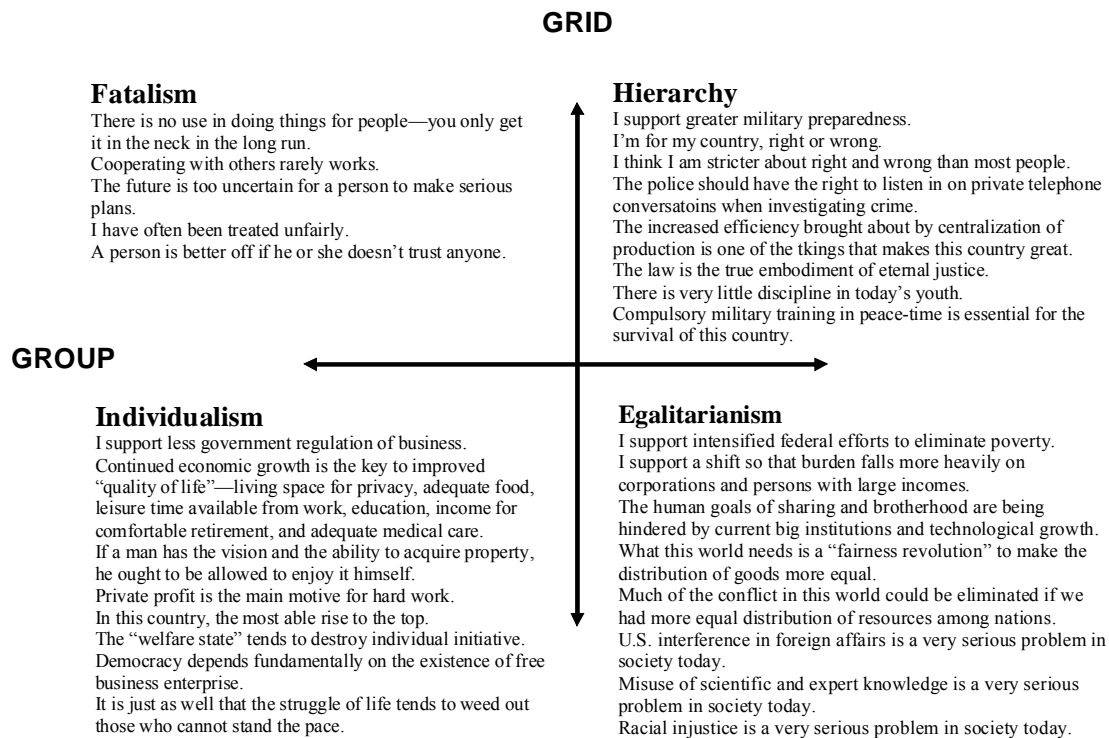


Figure 2. Dake's culture scales. Dake used these items to construct scales for measuring the "worldviews" associated with the group-grid quadrants. The Hierarchy, Egalitarianism, and Individualism scales were used to measure attitudes and analyze risk perceptions in his dissertation (1990) and were the basis of study results published by Dake (1991) and Wildavsky and Dake (1990). The "fatalism" scale was proposed later (Dake 1992).

This approach, it is suggested, faces two difficulties. The first has to do with the psychometric properties of the various scales. Dake himself did not report any measures of scale reliability. But subse-

¹ Among the many studies using Dake's measures or refinements thereof are Ellis and Thompson (1997); O'Connor, Bord and Fisher (1998); Peters & Slovic (1996); Langord *et al.* (2000); Jenkins-Smith (2001). There have been other approaches, however. For example, Steg and Sievers (2000) use measures based on "cultural myths" of nature to explain variance in environmental risk perception.

quent researchers have investigated this matter in depth, and they have often found that the separate scales used to measure the respective worldviews perform poorly, failing to display internal validity in tests such as Cronbach's *alpha* (Sjöberg 1998a; Gastil, Jenkins-Smith & Silva 1995; Marris, Langford & O'Riordan 1998).

The second problem is conceptual in nature. When one uses separate scales to measure each group-grid worldview, it becomes theoretically possible for a single individual to exhibit multiple, competing orientations—for example, to be simultaneously both a hierarchist and an egalitarian. Indeed, most likely because the items associated with discrete scales do not reflect a high degree of coherence or internal consistency, it's not uncommon for subjects to have high scores on competing scales (Marris, Langford & O'Riordan 1998). This feature of the Dake scales makes them unsuited for empirically testing cultural theory. Douglas and Wildavsky asserted that individuals attend selectively to risk in patterns that reflect and promote the ways of life to which they subscribe. That claim cannot be cleanly tested with measures that permit individuals to be characterized as subscribing to mutually inconsistent worldviews, for in that case Douglas and Wildavsky's position doesn't yield any determinate predictions about which risks they will credit and which they will dismiss.

3.2. Cultural Cognition

Some researchers, most notably, Hank Jenkins-Smith and his collaborators (Jenkins-Smith & Herron 2009; Silva & Jenkins-Smith 2007; Jenkins-Smith 2001), have made considerable progress in remedying these problems through refinement of Dake's measures. Cultural cognition, however, seeks to avoid them by departing more radically from Dake's strategy for measuring worldviews.

Hierarchy-Egalitarianism	Individualism-Solidarism
HCHEATS It seems like the criminals and welfare cheats get all the breaks, while the average citizen picks up the tab.	IENJOY People who are successful in business have a right to enjoy their wealth as they see fit.
HEQUAL We have gone too far in pushing equal rights in this country.	IFIX If the government spent less time trying to fix everyone's problems, we'd all be a lot better off.
HFEMININ Society as a whole has become too soft and feminine.	IGOVWAST Government regulations are almost always a waste of everyone's time and money.
HREVDIS1 Nowadays it seems like there is just as much discrimination against whites as there is against blacks.	IINTRFER The government interferes far too much in our everyday lives.
HREVDIS2 It seems like blacks, women, homosexuals and other groups don't want equal rights, they want special rights just for them.	IMKT Free markets--not government programs--are the best way to supply people with the things they need.
HTRADFAMA lot of problems in our society today come from the decline in the traditional family, where the man works and the woman stays home.	INEEDS Too many people today expect society to do things for them that they should be doing for themselves.
HWMNRTS The women's rights movement has gone too far.	INEEDY It's a mistake to ask society to help every person in need.
EDISCRIM Discrimination against minorities is still a very serious problem in our society.	IPRIVACY The government should stop telling people how to live their lives.
EDIVERS It's old-fashioned and wrong to think that one culture's set of values is better than any other culture's way of seeing the world.	IPROFIT Private profit is the main motive for hard work.
ERADEQ We need to dramatically reduce inequalities between the rich and the poor, whites and people of color, and men and women.	IPROTECT It's not the government's business to try to protect people from themselves.
EROUGH Parents should encourage young boys to be more sensitive and less "rough and tough."	IRESPON Society works best when it lets individuals take responsibility for their own lives without telling them what to do.
EWEALTH Our society would be better off if the distribution of wealth was more equal.	ITRIES Our government tries to do too many things for too many people. We should just let people take care of themselves.
EXSEXIST We live in a sexist society that is fundamentally set up to discriminate against women.	SHARM Sometimes government needs to make laws that keep people from hurting themselves.
	SLIMCHOI Government should put limits on the choices individuals can make so they don't get in the way of what's good for society.
	SNEEDS It's society's responsibility to make sure everyone's basic needs are met.
	SPROTECT The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals.
	SRELY People should be able to rely on the government for help when they need it.

Figure 3. Cultural cognition scales (“full form”). Study participants indicate the level of their “disagreement” or “agreement” with each item on a four- or six-point Likert response measure. Responses are then aggregated (with appropriate reverse-coding of the “E” and “C” items) to form continuous “Hierarchy-egalitarianism” and “Individualism-communitarianism” worldview scores. When these items are administered to U.S. general population samples, Cronbach’s *alpha* for each worldview scale consistently exceeds 0.70.

Cultural cognition uses two continuous attitudinal scales. One, “hierarchy-egalitarianism,” consists of items that determine a person’s relative orientation toward high or low “grid” ways of life. The other, “individualism-communitarianism” (we found that readers sometimes were confused by “solidarism,” the term we originally selected to denote the orientation opposed to individualism), consists of items that determine a person’s relative orientation toward weak or strong “group” ways of life. In studies performed on general population samples in the United States, these scales have proven highly reliable (e.g., Kahan, Braman, Gastil, Slovic & Mertz 2007; Kahan, Braman, Slovic, Gastil & Cohen 2009; Kahan, Braman, Monahan, Callahan & Peters 2010). They also avoid the logical indeterminacy problem associated with variants of Dake’s original measures. When one uses a single scale for group and a single

scale for grid, each individual respondent's worldview is identified with a unique point or coordinate in the "culture space" demarcated by the intersection of group and grid.

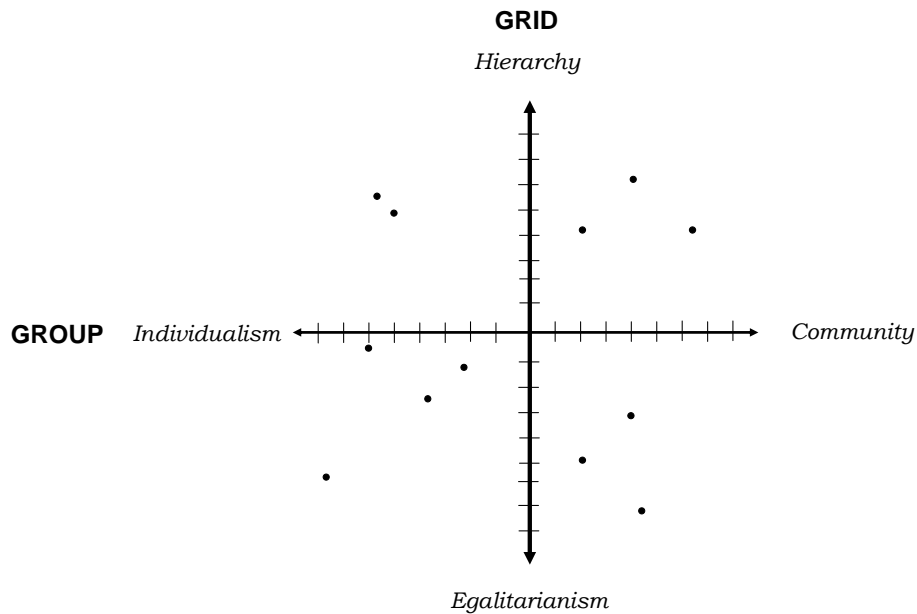


Figure 4. Cultural cognition “map.” The cultural cognition scales can be used to plot the location of any individual on a cultural cognition map (I’d certainly like to say “on a *grid*”—but you can see how confusing that would become) based on that individual’s scores on the “hierarchy-egalitarianism” and “individualism-communitarianism” scales.

More recently, studies using cultural cognition have relied on “short form” versions of the two scales (Kahan, Jenkins-Smith, Braman, in press). Each short-form scale consists of only six “agree-disagree” items that are “balanced” in attitudinal valance (three items supportive of each end of the two continuous scales). The scales are as reliable as the full-form counterparts. They load appropriately on discrete latent dispositions, generating orthogonal principal components or factors, the scores for which can be used as continuous measures.

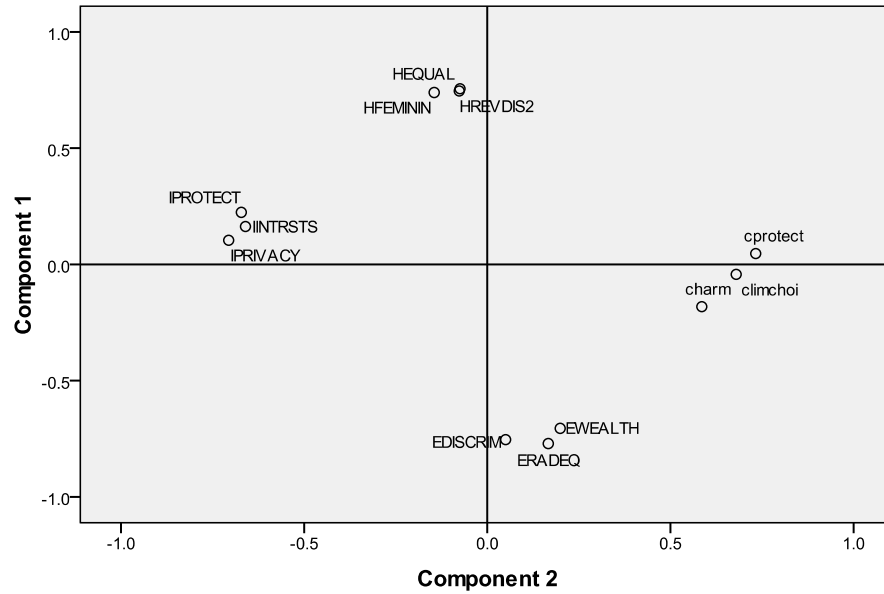


Figure 5. Short form culture scales. Short forms for Individualism-communitarianism (Cronbach’s $\alpha = 0.76$) and Hierarchy-egalitarianism (Cronbach’s $\alpha = 0.84$), each of which consists of six items loading on orthogonal principal components.

These properties of the scales make them well-suited for testing Douglas and Wildavsky’s theory. If “dangers are culturally selected for recognition” (Douglas 1985, p. 54), then there should be a significant correlation between individuals’ perceptions of risks hypothesized to promote one or another combination of worldviews and the position of individuals’ own worldviews on the “group-grid” map.

Psychometrically speaking, the scales should be thought of as measures of *latent* or unobserved dispositions, for which the items that make up the scales are simply observable indicators. Because the scales are continuous, they lend themselves readily to correlational analyses (including multivariate regression) in which their influence can be assessed without the loss of statistical power (and the potential bias) associated with splitting a sample into subgroups (Judd 2000).

Cultural theory assigns distinctive effects to the combinations of worldviews supportive of the “ways of life” that inhabit the quadrants of “group-grid.” We designate these four ways of life “hierarchical individualism,” “hierarchical communitarianism,” “egalitarian individualism,” and “egalitarian communitarianism” (Figure 6), labels we believe are intuitive and appropriately descriptive—albeit different from the diverse array of labels that cultural theorists tend to use (a matter I’ll return to presently).

Even when group and grid are conceptualized as two orthogonal continuous worldview dimensions, the use of an interaction term will make it possible to take account of any unique effects associated with particular combinations of low and high values on the two scales. Added, say, to a multivariate regression, such a term reports the impact of each worldview dimension conditional on a person’s location on the other (see generally Aiken, West & Reno 1991). As a result, the effect of a “hierarchical individualist” worldview, say, can have an effect different from (perhaps larger, perhaps smaller than) the one derived by simply adding a low group score and a high grid one.

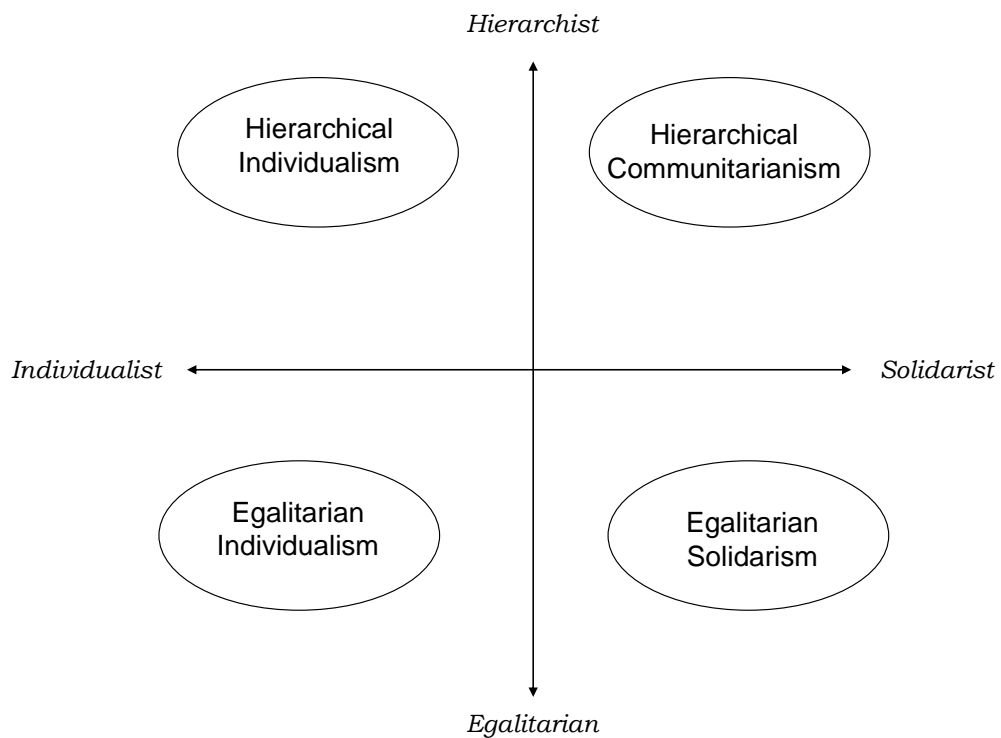


Figure 6. Cultural cognition “ways of life.” Cultural cognition scales contemplate that combinations of high and low values could have distinctive effects, which admit of measurement through a product interaction term.

3.3 But is it *cultural theory*?

However successful it might be in making “cultural worldviews” psychometrically tractable, this approach arguably faces problems of its own related to its fit with cultural theory. I will identify some of these, the elaboration of which also helps to paint a more vivid picture of cultural theory and its intricacies.

How many cultures?

One difficulty has to do with what Thompson, Ellis and Wildavsky (1990) refer to as the “impossibility theorem.” The “impossibility theorem” posits that there are a finite number of viable ways of life—five, according to Thompson *et al.* (1990), four according to many other cultural theorists—within the space demarcated by group-grid (Figure 7). Because cultural cognition measures treat group and grid as continuous, it might be understood to imply that there can be an infinite number of ways of life formed by congregations of persons around any coordinate in the group-grid map. The impossibility theorem says that’s “impossible”—only five (or maybe just four) ways of life are viable.

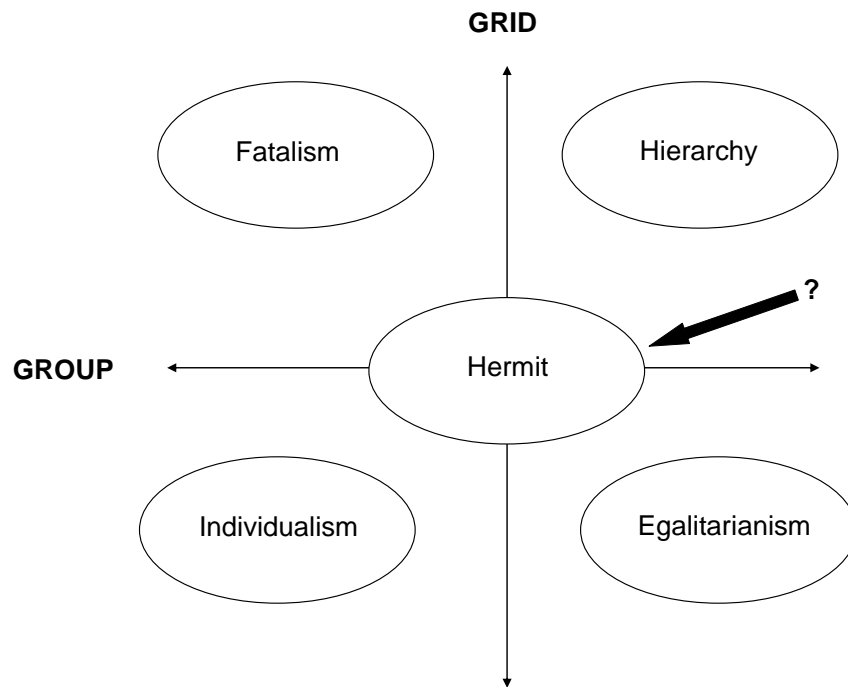


Figure 7. “Impossibility theorem”—only 5 (or maybe only 4). Certain cultural theorists asserts that the number of viable, discrete ways of life (and associated worldviews) within the group-grid scheme is finite, a position known as the “impossibility theorem,” which refers to the impossibility of intermediate ways of life in the interstices of the identified ones. Thompson, Ellis and Wildavsky (1990) posit five such ways of life. The “existence and position on the map” of the “Hermit” are “much disputed,” it is reported, in debates internal to cultural theory (Mamdouh 1999, p. 401).

To this point—which has been made to us by various cultural theorists—I myself would say the appearance of tension between the cultural cognition scheme and the impossibility theorem might well be illusory. Even if only a limited number of ways of life exist or are “possible,” it doesn’t follow, logically, that every individual must display a worldview that perfectly maps onto these ways of life. A certain

measure of heterogeneity among individuals is perfectly consistent with there being aggregations of persons who exert a dominant influence on social structures and affiliated worldviews (Braman, Kahan & Grimmelmann 2005). Under either of these conditions, we would expect individuals to form packages of risk perceptions characteristic of their groups in proportion to the strength or degree of attachment to the cultural groups with whom they are most closely affiliated (*cf.* Manton, Woodbury, Stallard & Corder 1992). That's basically what our measures are designed to show.

But in any case, no one, to my knowledge, has ever purported to empirically test, much less vindicate, the “impossibility theorem,” and at least some cultural theorists do indeed take the position (including Mary Douglas at certain points but not at others) that group and grid are inherently spectral in nature and capable of supporting any number of different coherent ways of life within the space demarcated by their intersection (Mamadouh 1999). My collaborators and I take a pragmatic attitude: we are more interested in finding a scheme for measuring cultural worldviews that is internally valid and that has explanatory utility than in finding one that fits a profile dictated by axiomatic, abstract theorizing.

Where have all the fatalists gone?

Another theory-based objection to the cultural cognition scheme is that it ignores “fatalism.” Fatalism is a way of life that Douglas and many other culture theorists associated with weak-group, high-grid. It is said to generate a worldview that disposes people to accept the diminishment of personal agency and a corresponding perception that steps to abate risk will be futile (Thompson, Ellis & Wildavsky 1990).

The constructs measured by the cultural cognition scales do not imply that weak-group, high-grid social relations will result in a fatalistic way of life or worldview. Rather, this combination of dispositions will cohere with modes of life in which people, as individualists, are strongly resistant to regulation of affairs by remote, collectivist-minded authorities, but still organize their local institutions in highly regimented, and highly stratified, ways. Think of the iconic American cowboy, the “Marlboro Man”: He bridles at outside interference with the operation of his ranch, yet still exerts authority over a small community whose members—from ranch hands, to wives, to sons and daughters—all occupy scripted, hierar-

chical social roles.² He is likely to form a dismissive attitude toward environmental risks (the contribution to global warming associated with his cows' methane emissions, say). However, he might be very concerned that various forms of social deviance could threaten order and generate other bad collective consequences (the residents of Broke Back Mountain, on his view, are destined for calamity). He is no fatalist—he has lots of agency, and he is selectively, not uniformly, risk sensitive.

My own response to this disconnect between the cultural cognition scales and conventional culture theory is a sort of shrug of the shoulders. In truth, I've never gotten the theoretical explanation of why weak-group, high-grid would generate a “fatalistic” way of life. Indeed, I have a hard time even understanding how fatalism could be a *group way of life*, or why a fatalist stance toward risk could be identified as a worldview as opposed to, say, a personality trait of some kind (possibly one the baleful effects of which could be treated with appropriate pharmaceutical interventions). I think the way of life of the Marlboro Man supplies a more cogent account of what one expects to see with the convergence of hierarchy and individualism. It also happens to generate testable predictions, ones our research confirms, about the distinctive schedule of risk perceptions that people with those worldviews are likely to form. Therefore, I'm inclined to give the infamous “so?” response of Dick Cheney—a Marlboro Man if ever there was one—to the complaint that cultural cognition disregards fatalism.

But I would add to this response that other conceptions of cultural theory also display ambivalence toward fatalism. Dake's original work did not include a fatalism scale, and his analyses reporting the results were confined to assessments of the risk-shaping impact of Hierarchy, Egalitarianism, and Individualism (Wildavsky & Dake 1990; Dake 1990, 1991). In addition, Wildavsky, in his individual writings on how culture influence risk perception and mass political opinion, always left fatalism out of the story too (e.g., Wildavsky 1991), maybe because he was likewise puzzled by it.

² Better still, think of the frontier mining town depicted in the HBO television series *Deadwood*. The community is filled with highly self-reliant figures (prospectors, pioneers, itinerant cowboys, fugitive saloon keepers and the like), who chafe at organized authority (e.g., that exercised by the U.S. government, which wants to annex the territory in which Deadwood lies), but who occupy an intricate lattice of stratified, norm-governed roles (“white man” vs. “Chinaman”; “woman of refined manners” vs. “whore”; “man of means” vs. “vagabond,” etc.).

Where are cultural views located? Institutions vs. Individuals

Yet another conflict between cultural cognition position and at least one understanding of how cultural theory works relates to who should be regarded as the *subject* of cultural worldviews. Cultural cognition theory assumes that cultural worldviews are latent predispositions of individuals (that is, shared but unobserved orientations that one can measure, with varying degrees of precision, by observable indicators, primarily in the form of professed attitudes). Another view, put forth (at least intermittently) by Stephen Rayner and Michael Thompson, asserts that in fact it is a mistake to see cultural worldviews as fixed or stable features of individuals; rather they are immanent properties of institutions, characterized by one or another mode of social organization, that systematically endow individuals with outlooks conducive to the operation of those institutions during the time (but only then) that individuals happen to occupy roles within them (Rayner 1992).

This picture of how culture shapes risk perceptions is at odds not only with cultural cognition. If it is right, then *any* conception of cultural theory that tries to use individual-level measures of worldviews as an explanatory variable is flawed. Individuals are only temporary receptacles of institution-supporting worldviews that get poured into them as they move from place to place. They will thus “flit like butterflies from context to context, chanting the nature of their arguments as they do so” (Rayner 1992, pp. 107-08).

Some might wonder if such a view could ever generate testable predictions. I think it likely could. All we need (and I don’t say this facetiously) is a valid and reliable way for measuring what worldviews “contexts” (nuclear power plants; universities; stock trading floors) of different sorts have. We could then randomly move individuals around from one to one, and see if their risk perceptions—on climate change, say, or on gun possession, or nanotechnology—changed in the ways that cultural theory predicts. (We’d need to randomly manipulate the respondents’ locations, rather than just going to those places and polling the people we find at them, for as Rayner notes (1992, p. 107), the view that cultural worldviews belong to individuals predicts that they will self-select into institutions that are congenial to their preferred mode of social ordering.) I seriously doubt that such an experiment would confirm the “social mobility hypo-

thesis,” as Rayner dubs it. But I do indeed hope that my doubt spurs him and others to conduct the sort of internally valid test that would be required to settle the issue and that to my knowledge no one has yet attempted.

If they succeed, of course, they might or might not have established a conception of cultural theory, but they will definitely have *demolished* the conception that Douglas and Wildavsky appeared to subscribe to, which was obsessed (for understandable reasons) with political conflict over risk. The egalitarians, individualists, and hierarchists in *Risk and Culture* (1982) were groups of people—not buildings or even “sectors” of some sort of multi-faceted system—who disagreed with each other about the ideal society. The gripping and compelling story Douglas and Wildavsky told about such disagreements would have fallen apart if we imagined that the people who were fighting each other on nuclear power or air pollution were just the ones who at any given moment of the day happened to be at home, at work, at the university, at the salon, etc. Similarly, when we try to make sense of “climate change skeptics” and “climate change believers” today—something even Rayner and Thompson would like to do (e.g., Verweij *et al.* 2006)—we are trying to understand *people* with relatively stable beliefs, not just temporary receptacles for risk outlooks that get poured into them as they wander from place to place. If we want a theory that explains who believes what and why about politically contested empirical claims about risk, then the “social mobility hypothesis” conception of cultural theory is of no use. Or more accurately, if it can be shown that risk perceptions aren’t persistent but vary in individuals as they move from place to place, we should stop trying to do what cultural cognition and all the other conceptions of cultural theory that reflect what Rayner calls the “stability hypothesis” (which he attributes to Douglas herself) try to do—viz., find explanations for patterns of variance in risk perceptions of different groups of people. Because if the “social mobility” position is right, the explanandum of all such conceptions of cultural theory turns out to be just a (very amazing!) illusion.

But there’s simply no point arguing about which—the “mobility” or “stability” hypothesis—is the “right” view of cultural theory in the abstract. The only version of cultural theory that anyone could have

any reason to prefer is the one that actually explains the world we live in. So let the matter be resolved by empirical testing.

Whose worldviews? Cross-cultural risk perception

Another objection to cultural cognition as a conception of cultural theory is that it is parochial. We devised our cultural worldview measures because we wanted to understand variance in perceptions of risk within the U.S. public, and didn't think that Dake's measures and variants thereof had psychometric properties necessary to allow us to do that. Accordingly, we developed the measures using U.S. subjects, ones who we interviewed in subjects groups and to whom we administered successive versions of our measures, first in writing and then in phone interviews, over a period of years. It has been pointed out to us, by Mary Douglas herself among others (Douglas 2003), that our measures have a distinctly "American feel," particularly in relation to their picture of hierarchy, which reflects elements of social stratification (racial ones, for example) that have played a conspicuous part in animating hierarchic modes of social organization historically in the United States. Some critics of Dake's measures dismissed them on the ground that if you simply translated them into another language—say, Swedish or Portuguese—they did not furnish reliable measures or predict risk perceptions in the manner that cultural theory says they should (Sjöberg 1998b). I suspect our measures, if subjected to the same test, would also perform poorly, even though they work well for U.S. samples.

But in my view, that test reflects a very odd expectation of what a successful conception of cultural theory should be able to deliver. Douglas, in a position that was very controversial in its own right, did indeed suggest that the group-grid framework would have an element of universality to it, supplying worldview constructs that could be used to make sense of conflicts over risk across place and time. Let's grant that she was right (but only for the sake of moving forward; it is a bold claim that merits testing, not an axiom to be dogmatically asserted or recklessly assumed). It is another matter entirely to say that the *indicators* of the latent dispositions associated with these worldviews must be the same everywhere and forever. Why would we think that when we ask a Hadzabe bushman—or even a Swede or Brazilian—would react the way a contemporary American does to the proposition that "it seems like the criminals

and welfare cheats get all the breaks, while the average citizen picks up the tab”? What reason is there to think the two will attach the same *meaning* to this proposition (or that the former will even attach any to it)? If they don’t, then this item won’t *be* a valid or reliable measure of any sort of latent disposition they happen to share. Because the theory is that differences in a latent characteristic explain variation in risk perception, the way to test the theory is to develop observable indicators that are reliable and valid for that latent characteristic *in* the sample one is studying.

I’d also say that while it’s plausible that the same cultural predispositions toward risk will help to explain variance everywhere, it isn’t necessarily going to be the case that the variance they explain is the same in all places. Douglas teaches that risks grab individual attention and become the currency of blame because of what risk taking behavior connotes about the authority and legitimacy of contested social orderings: “Each culture must have its notions of dirt and defilement which are contrasted with its notion of the positive structure which must not be negated” (Douglas 1966, p. 160). Those connotations, she recognized full well, will also be a matter of decisive historical contingency. The meanings that made ancient Jews believe that defiance of the commandments of Yahweh would cause him to “strike [them] with consumption, and with fever and with inflammation and with fiery heat and with the sword and with blight and with mildew” (*Deuteronomy* 28:22; quoted in Douglas 1966, p. 51) were unique to them. If we found today at similar coordinates in the group-grid map a group in the Upper West Side of Manhattan, we would not expect them to attribute floods and fires to the profaning of God—but we *might* expect them to attribute those *very* things to forms of behavior (corporate industrialization and excessive personal consumption) that bear meanings that defy *their* shared commitments. So by the same reasoning, why should hierarchy today dictate the same posture toward the risk of carrying guns in societies of historical experiences as diverse as, say, those of England and the U.S.? In other words, the validity—and value—of a theory that predicts *that* individuals of opposing predispositions will mobilize themselves into opposing factions over risk doesn’t depend on it being able to say, in a manner oblivious to the historical circumstances of such people, *what* that dispute will be about (Kahan & Braman 2003b).

Recently, social psychology has begun to explore “cross-cultural” differences in cognition generally. This line of work focuses on identifying society-level variation, typically between members of “Eastern” (generally, Asian) and “Western” (European) nations. Differences in how members of such societies individuate collective entities (“schools of fish,” e.g.) from their individual constituents (“individual fish”) is thought to reflect and reinforce diverse understandings of individual and collective responsibilities and prerogatives (Nisbett 2003). This body of work—which is as fascinating as it is important—is a separate line of inquiry from the one associated with the cultural cognition of risk. It’s possible they might at some point be shown to be connected in some way, although the two seem to reflect different assumptions about the scale of “cultural variation”: whereas the “cross-cultural cognition” paradigm envisions that differences in values will manifest themselves at the societal level, the “cultural cognition of risk” focuses on how differences in values result in *intrasocietal* conflicts, ones that are likely to be distinctive of conditions that are relatively local in time and space.

4. Mechanisms

Now I turn to the *mechanisms* of cultural cognition. The idea of “mechanisms of cultural cognition” is meant to be an answer the question *why* individuals are disposed, as Douglas and Wildavsky maintained, to form risk perceptions that cohere with the ways of life they subscribe to.

Douglas and Wildavsky, in separate writings, developed an admittedly *functionalist* answer to this question (Douglas 1986; Thompson, Ellis & Wildavsky 1990). That is, they both took the position that individuals form risk perceptions congenial to their ways of life precisely *because* holding those beliefs about risk cohere with and promote their ways of life. This sort of reasoning—which is associated with classical sociological accounts of ideology—has developed a bad reputation in contemporary social science, which sees it as implausibly attributing agency to collective entities (Boudon 1998). Douglas and Wildavsky were fully aware of this and related objections, and developed ingenious arguments to try to deal with them.

I and the other researchers doing work with cultural cognition take a different tack. The *mechanisms* hypothesis is that worldviews yield risk perceptions through a set of social and psychological processes. The processes are well established; they are the heart of the “psychometric paradigm” or psychometric theory of risk pioneered by my collaborator Paul Slovic (2000). What hasn’t been fully recognized until now, our research suggests, is how these social and psychological processes interact with cultural ways of life, generating individual differences in risk perception between people who subscribe to competing worldviews (Kahan, Braman, Cohen, Gastil & Slovic in press). But importantly, this is not a functionalist account because the social and psychological processes associated with the psychometric paradigm, although different from the ones stressed by rational choice economics, don’t treat the needs of collective entities as the causes of individual behavior but instead derive collective behavior from the interaction of individuals self-consciously pursuing fulfillment of their own ends (Balkin 1998; Elster 1985).

Although this marriage of cultural theory and the psychometric theory of risk wasn’t one that Mary Douglas herself ever sanctioned, she at least recognized such a union as a possible strategy for showing how cultural theory works. She did this in a famous essay, “The Depoliticization of Risk” (1997), which specifically criticized Slovic for failing to explore the interaction of culture and the mechanisms of the psychometric paradigm—a feature of Slovic’s research, she maintained, made it innocent of political conflict over risk. “If we were invited to make a coalition between group-grid theory and psychometrics,” Douglas wrote, “it would be like going to heaven” (*ibid*, p. 132). In a sense, cultural cognition, to which Slovic himself has made major contributions, *is* such an invitation. But Douglas, I own, might not have intended to be taken seriously when she made this remark, and few of the scholars who are most interested in her work today have shown any interest in this strategy for exploiting the full richness of her and Wildavasky’s thoughts on risk perception.

Whether or not viewed as faithful to Douglas’s vision, studies that use psychometric concepts and methods have identified a variety of discrete mechanisms of cultural cognition. The ones I’ll discuss are *identity-protective cognition; biased assimilation and group polarization; cultural credibility; cultural*

availability; and *cultural identity affirmation*. I'll go through them in order, saying something about how each one works in general and then something about studies we've done that suggest their influence in connecting cultural worldviews to risk perceptions. This is not an exhaustive list; research is ongoing to investigate additional ones. But these are ones for which there is the best evidence so far.

4.1. Cultural identity-protective cognition

Identity-protective cognition refers to the tendency of people to fit their views to those of others with whom they share some important, self-identifying commitments. Group membership supplies individuals not only with material benefits but a range of important nonmaterial ones, including opportunities to acquire status and self-esteem. Forming beliefs at odds with those held by members of an identity-defining group can thus undermine a person's well-being—either by threatening to drive a wedge between that person and other group members, by interfering with important practices within the group, or by impugning the social competence (and thus the esteem-conferring capacity) of a group generally. Accordingly, individuals are motivated, unconsciously, to conform all manner of attitudes, including factual beliefs, to ones that are dominant within their self-defining reference groups (Cohen 2003; Giner-Sorolla & Chaiken 1997).

The cultural theory of risk holds that groups defined by diverse worldviews can be expected to disagree about risk. Identity-protective cognition furnishes a plausible explanation for why this would be so. One test—of cultural theory generally, and of this particular mechanism for it—would be to determine whether risk perceptions are indeed distributed across groups in patterns that are best explained by the stake individuals have in maintaining the status of, and their status within, groups defined by shared worldviews.

Using our culture scales, we have gathered evidence of such a relationship for a wide variety of risks (Figure 8). Thus, we have been able to show that perceptions of environmental and technological risks vary sharply along the lines that Douglas and Wildavsky suggests: that is, as individuals become simultaneously egalitarian and communitarian in their values, they become more concerned, and as they

become hierarchical and individualistic less, with climate change, nuclear waste disposal, air pollution, and the like (Kahan *et al.* 2007). We have also formed and tested our own hypotheses about the distribution of various other risk perceptions that we expected—based largely on ethnographic, historical, and other forms of inquiry—would pit individuals located in one or another quadrant of the group-grid map against those from another. On whether private gun ownership increases or decreases violent crime; on whether abortion impairs the health of women (*ibid*); on whether legally compelled submission to medical treatment (including psychotropic drugs) promotes the well-being of mentally ill individuals and the safety of their communities (Kahan, Braman, Monahan, Callahan & Peters 2010)—in all these cases, we have found that cultural worldviews, as measured with our scales, explained variation better than other individual characteristics, including education, income, personality type, and ideology.

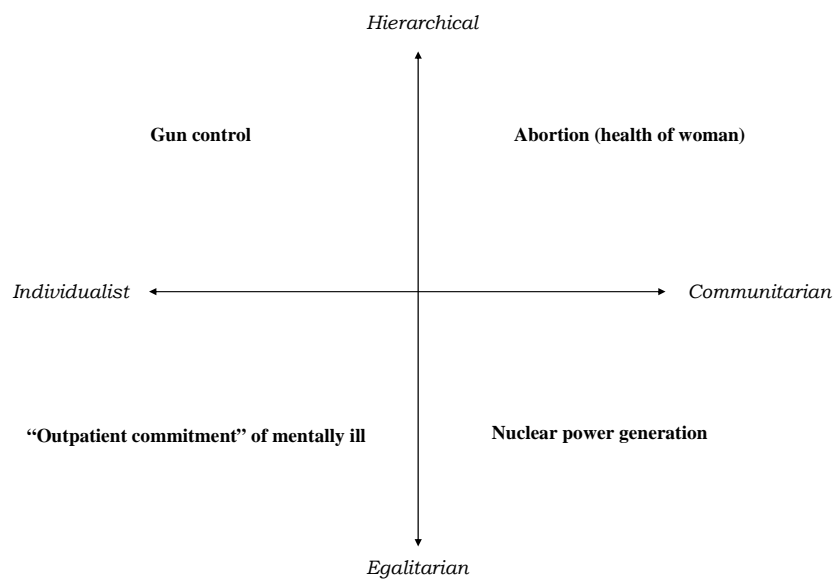


Figure 8. The distribution of risk perception and cultural identity-protective cognition. Survey evidence establishes that risks associated with the indicated activities are highly correlated with the indicated combination of cultural worldview values even after controlling for other influences. These and like patterns furnish evidence that cultural identity-protective cognition affects the formation of risk perceptions.

Indeed, the strongest evidence for cultural identity-protective cognition comes from the power of cultural worldviews to explain gender and racial variance in risk perceptions. The “white male effect” refers to the tendency of white males to regard all manner of societal risk as smaller in magnitude and seriousness than do women and minorities (Finucane *et al.* 2000). We hypothesized (Kahan *et al.* 2007)

that culturally grounded, identity-protective cognition might explain this phenomenon. White males who subscribe to ways of life that feature race and gender differentiation in social roles, our reasoning went, have a special stake in putatively dangerous activities essential to their cultural roles. Accordingly, they should be more powerfully impelled by identity-protective cognition than anyone else to resist the claim that those activities are hazardous for society and should be restricted.

Consider environmental risk perceptions. Hierarchists are disposed to dismiss claims of environmental risks because those claims implicitly cast blame on societal elites. But white male hierarchists, who acquire status within their way of life by occupying positions of authority within industry and the government, have even more of a stake in resisting these risk claims than do hierarchical women, who acquire status mainly by mastering domestic roles, such as mother and homemaker. In addition, *white* hierarchical males are likely to display this effect in the most dramatic fashion because of the correlation between being nonwhite and being an egalitarian.

In a study involving a nationally representative sample of 1,800 U.S. residents, we found strong evidence in support of these hypotheses (Kahan *et al.* 2007). We found that the race effect in environmental risk perceptions—which persisted even when characteristics such as income, education, and liberal-conservative ideology were controlled for—disappeared once hierarchy and individualism were taken into account. In addition, we found the hypothesized interaction between gender and hierarchy; that is, a disposition toward hierarchy exerted a much stronger effect toward environmental-risk skepticism in men than in women. Indeed, once the extreme risk skepticism of white hierarchical males was taken into account, the gender effect in environmental risk perceptions also disappeared.

We found a similar effect with gun risk perceptions. In the United States, guns enable largely hierarchical roles such as father, protector, and provider, and symbolize hierarchical virtues such as honor and courage. Within hierarchical ways of life, moreover, these are roles and virtues distinctive of men, not women, who again occupy roles that don't feature gun use. These roles and virtues are also largely associated with being a *white* male, in large part because of the historical association of guns with maintenance of racial hierarchy in the South. On this account, then, we should expect white hierarchical males to

be much more invested in gun possession, and thus to be impelled much more forcefully by identity-protective cognition to resist the claim that guns are dangerous and that gun ownership should be restricted. And this is again exactly what we did find in our national study.

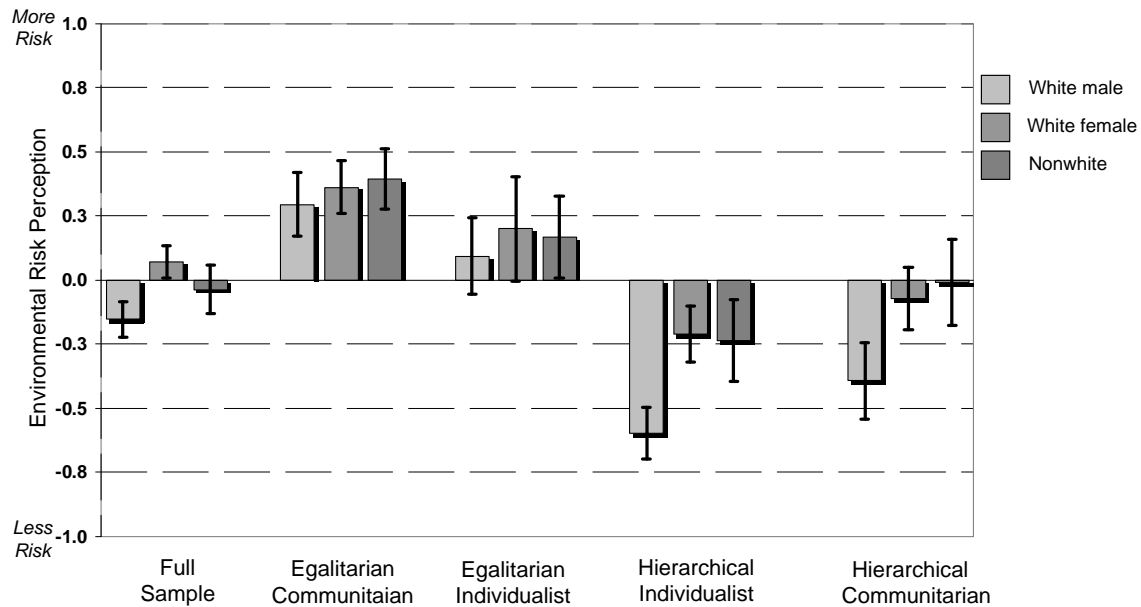


Figure 9. Cultural identity-protective cognition and the “white male effect.” Bars indicate z-score on composite “Environmental risk perception” measure (climate change, air pollution, and nuclear power; Cronbach’s $\alpha = 0.72$). Scores are derived from multivariate regression that included cultural worldview measures, race and gender, and appropriate interaction terms, and controlled for numerous other individual characteristics including education, income, personality type, and political ideology. CIs reflect 0.95 level of confidence. The analysis shows that the sample-wide differential between white males and others is attributable entirely to the extreme risk skepticism of hierarchical white males. The differential is largest among hierarchical individualists. Based on data in Kahan *et al.* (2007), Table 2, Model 3.

4.2 Culturally biased assimilation of (and search for) information(?) and cultural polarization

“Biased assimilation and polarization” is a dynamic that characterizes information processing. When individuals are unconsciously motivated to persist in their beliefs, they selectively attend to evidence and arguments, crediting those that reinforce their beliefs and dismissing as noncredible those that contravene them. As a result of this “biased assimilation,” individuals tend to harden in their views when exposed to a portfolio of arguments that variously support and challenge their views. By the same token, when *groups* of individuals who are motivated to persist in opposing beliefs are exposed to balanced in-

formation, they don't converge in their views; as a result of biased assimilation they *polarize* (Lord, Ross, & Leper 1979).

My collaborators and I have hypothesized that identity-protective cognition would unconsciously motivate individuals to assimilate risk information in support of culturally congenial results, and hence drive people with opposing worldviews apart as they consider information (Kahan, Slovic, Braman & Gastil 2006). If so, *culturally* biased assimilation and polarization could be treated as another mechanism for the sorts of relationships between worldview and risk perception posited by cultural theory.

One study we did to test this possibility focused on nanotechnology risks (Kahan, Braman, Slovic, Gastil & Cohen 2009). Nanotechnology involves the creation and manipulation of extremely small materials, on the scale of atoms or molecules, which behave in ways very different from larger versions of the same materials. It's a novel science: about 80% of the American public say they have either never heard of it, or have heard only a little. We did an experiment in which we compared the nanotechnology risk perceptions of subjects to whom we supplied balanced information risk-benefit information to subjects to whom we supplied no information.

The results (Figure 10) confirmed our hypothesis. In the no-information condition, individuals of opposing cultural worldviews held relatively uniform risk perceptions. That's not surprising, since the vast majority of them had never heard of nanotechnology. In the information condition, however, hierarchs and egalitarians, and individualists and communitarians, all formed opposing views. In other words, individuals holding these worldviews attended to the balanced information on nanotechnology in a selective fashion that reinforced their cultural predispositions toward environmental and technological risks generally. As a result, they polarized.

This result thus uses an established mechanism of social psychology—biased assimilation—to ground culturally grounded individual differences in risk perception. But in a reciprocal fashion, it also contributes something a bit back to general understandings of that very mechanism.

Conventionally, biased assimilation is determined with reference to individuals' prior beliefs. For example, people who disagree about whether the death penalty deters murder will, when shown studies that reach opposing conclusions, grow even more divided (Lord, Ross & Lepper 1979)

But in our study, individuals, by and large, *had* no priors; most of them said they had not heard anything or anything of significance about nanotechnology before the study. They attended to information, then, in a biased manner supportive of a *predisposition* toward risk. This is a refinement and extension of the biased assimilation/polarization concept. It also attests to the utility of cultural cognition as a *predictive* tool that might be used to anticipate and even, as I will discuss presently, *manage* how diverse persons will react to information about an emerging technology.

Because some of our subjects had in fact learned something about nanotechnology even before the study, we also compared how individuals reacted to information conditional on the level of their prior familiarity. Previous public opinion studies had consistently shown that although relatively few people are aware of nanotechnology, those who are have an extremely positive view of its benefits relative to its risks. This finding has prompted some to infer that as word of nanotechnology spreads, members of the public generally will form positive impressions of this novel science. This is, obviously, a hypothesis at odds with our own.

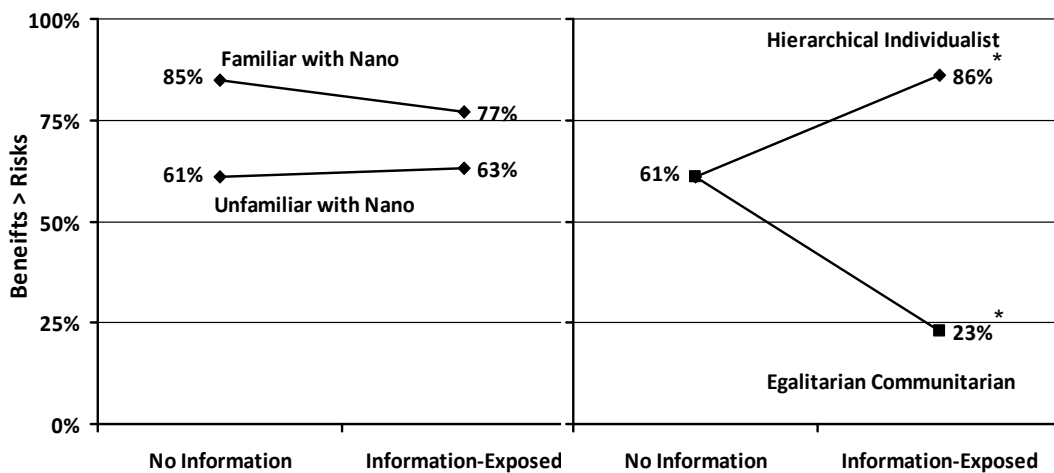


Figure 10. Biased assimilation/polarization of nanotechnology information. *N* = 1,850. Results derived from statistical simulation based on multivariate logistic regression involving worldviews, information exposure, and

prior familiarity with nanotechnology. * denotes difference between conditions significant at $p < 0.05$. Panel (a) shows reactions of subjects to balanced information conditional on prior familiarity and controlling for cultural worldviews. Panel (b) shows reactions of subjects to balanced information conditional on cultural worldviews and controlling for prior familiarity, Source: Kahan *et al.* 2009.

We found no support for it. It was the case that individuals in our “no information” condition who reported knowing more about nanotechnology had a more favorable view than those who reporting knowing nothing or only a little. But when exposed to information, subjects of the latter description did not react in a uniformly positive way; again, they reacted positively or negatively conditional their cultural worldviews (Figure 10).

We also found out something else interesting about the individuals who claimed they knew a lot or a substantial amount about nanotechnology: they weren’t (on average) afraid of anything. They rated the risks of nuclear power as low. They didn’t worry about “mad cow disease” or genetically modified foods. They saw owning a gun as low risk too. And so on (Figure 11).

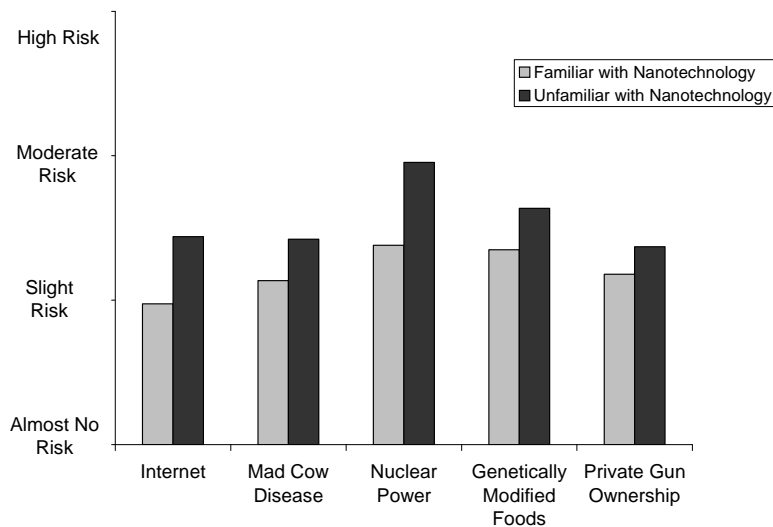


Figure 11. Other risk perceptions among subjects familiar and unfamiliar with nanotechnology. $n = 1,820$ to $1,830$. Risk variables are 4-pt measures of “risk to people in American Society” posed by indicated risk. Differences between group means all significant at $p \leq 0.01$. Source: Kahan *et al.* 2009.

What to make of this? Should the National Rifle Association or the Nuclear Power Chamber of Commerce flood the streams of public communication with information about nanotechnology? Obviously not. This is the signature of spurious correlation: information about nanotechnology is not causing individuals to see guns, the internet, genetically modified foods, nuclear power and so forth as safe; some

third influence is causing people *both* to form the view that these risks are low *and* to become interested enough in nanotechnology to learn about it before others do.

Why, then, should we not suspect the relationship between familiarity with nanotechnology, on the one hand, and a positive view of its risks and benefits, on the other, as spurious too? Indeed, we'd shown in our experiment that information exposure *doesn't* cause individuals to form a positive view. So we tried to see if we could identify a third influence that both causes individuals to learn more about nanotechnology and to see it as low risk.

It shouldn't be hard at this point to guess what we found. The influence that predicts familiarity with nanotechnology is an individual's cultural worldview (Figure 12). The more individualistic a person is, the more likely he or she is to claim to know about nanotechnology, conditional on that person being simultaneously hierarchical in his outlooks—the combination of values that the experiment shows does indeed predispose individuals to become more disposed to form a positive view of nanotechnology when they learn about it.

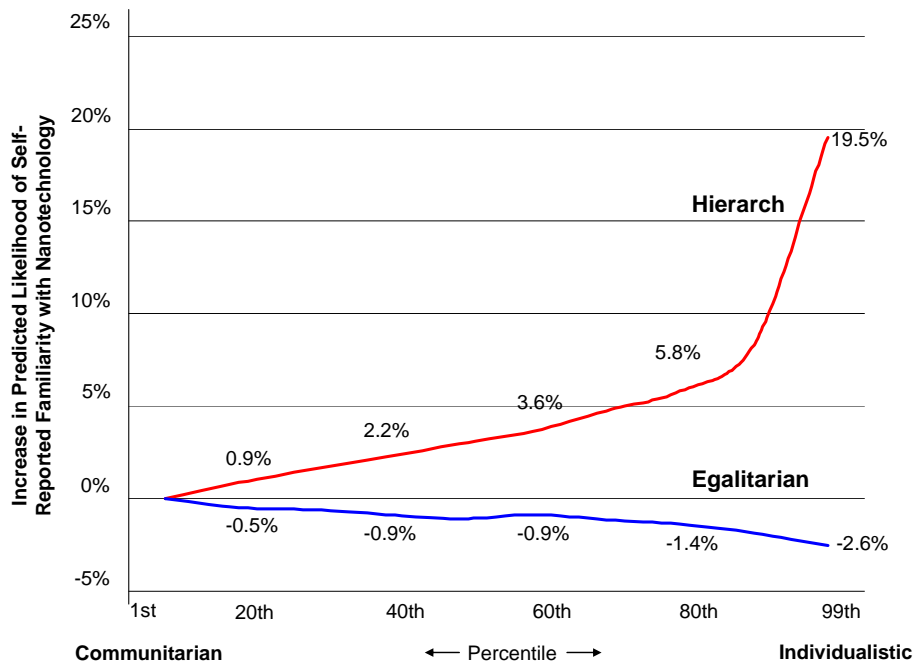


Figure 12. Predicting familiarity with nanotechnology. $N = 1,800$. Derived from simulation based on multivariate logistic regression with race, sex, gender, education, income, political ideology, and cultural worldview predictors. Interaction between hierarchy and individualism is significant at $p < 0.05$. Source: Kahan *et al.* 2009.

In this study, then, we have the core of a psychometric theory of how culture influences risk perception. Individuals bear cultural predisposition toward risk—a tendency (founded on identity-protective cognition) to view some risk claims more congenial than others on the basis of latent characteristics indicated by values they share with others. This predisposition not only endows culturally diverse individuals with opposing “prior” beliefs about risk. It also decisively regulates their experience with information about the truth or falsity of those beliefs. People with opposing predispositions seek out support for their competing views through opposingly biased forms of information search. What’s more, they construe or assimilate information, whatever its provenance, in opposing ways that reinforce the risk perceptions they are predisposed to form. As a result, individuals end up in a state of cultural conflict—not over values, but over *facts*—that the mere accumulation of empirical data cannot be expected readily to dispel (Figure 13).

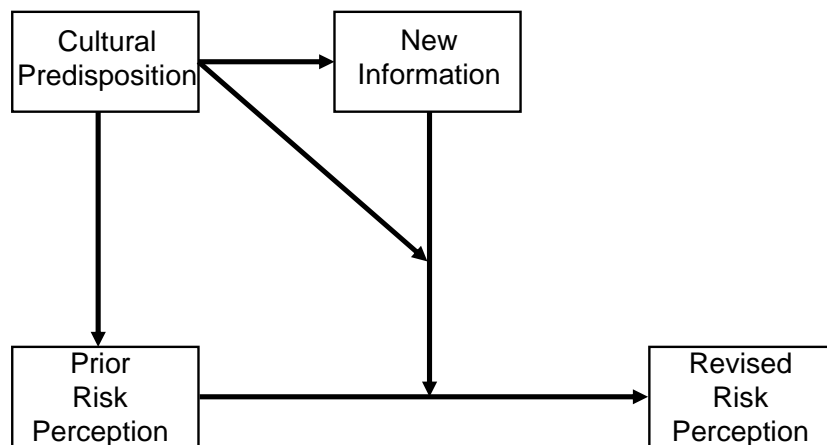


Figure 13. Biased assimilation and search. Experiment results show that same cultural predisposition responsible for beliefs about environmental risk influence both the search and the effect given to new information.

4.3. Cultural availability

The “availability effect” describes a typical distortion that occurs when individuals assess a risk (Kahneman & Tversky 1982). If instances of some fact or contingency relevant to the risk are highly salient, individuals are more likely to notice, assign significance to, and remember them. When they are required to consider the incidence of such a contingency thereafter, the ease with which those instances can be recalled will induce individuals to overestimate their occurrence. The ready availability of mishaps such as the Chernobyl nuclear accident, the 911 attack, and the Columbine school-shooting massacre, for

example, are thought to explain why members of the public tend to overestimate the risks of nuclear power generation, of terrorist attacks, of accidental handgun shootings and the like, particularly in relation to less dramatic hazards—swimming pool drowning, say, or climate change.

There is a fairly obvious mystery associated with the availability effect, however: what gives one or another contingency the salience necessary to trigger the effect? The seemingly obvious answer—the vivid or horrific consequences that attend it—in fact begs multiple questions. If people viewed the accidental drowning deaths of children as being as horrific as accidental shooting deaths, then presumably they would notice (or have their attention drawn by the media to³) the former more often; they would thereafter more readily recall instances of such mishaps; and as a result they would revise upward their estimation of the incidence of them relative to accidental shootings—which are in fact much rarer. So what it is that makes some risk-related contingencies horrific and others not? And if horrifically vivid consequences are what trigger availability, why do people systematically *disagree* about nuclear power plants, domestic terrorist incidents, and climate change, all of which are attended by signature images of calamity? Indeed, people disagree about the incidence of risk-relevant facts even after attending to images they *agree* are compelling and horrific: in the wake of a school shooting massacre, some people revise upward their estimate of the risks associated with permitting private citizens to own guns, while others revise upward their estimate of the risks associated with *prohibiting* law-abiding citizens from carrying guns to defend themselves. So what determines why people attach differential *significance* to salient, readily available instances of some contingency?

³ Disproportionate media coverage of various types of accidents is a weak explanation for the greater “availability” of them in the public mind, since the media’s incentive to cover one type of accident disproportionately is itself a (market-driven) reflection of the public demand for news relating to that very type of accident. In one scene of Michael Moore’s movie *Bowling for Columbine*, the “documentary” team rushes to get footage from the scene of a reported accidental shooting only to discover when they arrive that television news crews are packing up their gear. “What’s going on? Did we miss it,” Moore asks, to which one of the departing TV reporters answers, “no, it was a false alarm—just a kid who drowned in a pool.” One would suspect Moore was trying to make a point—that the media’s responsiveness to the public obsession with gun accidents contributes to the public’s inattention to the greater risk for children posed by swimming pools—if the movie itself were not such an obvious example of exactly this puzzling, and self-reinforcing distortion. Apparently, it was just one of those rare moments when 1,000 monkeys thoughtlessly banging on typewriters (or editing film) surprise us with genuine literature.

One possibility, I and my collaborators have conjectured, is culture (Kahan & Braman 2003a). If people are more likely to notice risk-related contingencies congenial to their cultural predispositions, to assign them significance consistent with their cultural predispositions, and recall instances of them when doing so is supportive of their cultural predispositions, then the availability effect will generate systematic individual differences among culturally diverse individuals. That would make *cultural availability* another mechanism of cultural cognition.


We examined this mechanism in a study of public perceptions of scientific expert consensus (Kahan, Jenkins-Smith & Braman in press). Public dispute about the extent, causes, and likely consequences of climate change often is cited as proof that substantial segments of the population are willing to buck “scientific consensus” on risk issues. But what’s the evidence that those who are skeptical of climate change believe their view is contrary to “scientific consensus”? Why not consider the possibility that such persons are conforming their impressions of what most scientists believe to their own cultural predispositions on climate change? And why not investigate whether the same is true of those who *do* perceive climate change to be a serious risk? A “cultural availability effect” would predict exactly this sort of division: If people are more likely to notice, to assign significance to, and to recall the expression of an expert opinion when it is congenial to their cultural predispositions, then they will form diametrically opposed estimates of what most scientists believe—and not just on climate change, but on a variety of other risk issues that admit of scientific investigation but that are nonetheless culturally charged.

Our study generated two sorts of evidence suggestive of a cultural availability effect on scientific consensus. The first came from an experiment to see whether cultural predispositions affect whether someone is likely to take note of an expert’s opinion. In the experiment, we asked each subject to imagine a friend was trying to make up his or her mind on the existence and effects of climate change, on the safety of nuclear power, or on the impact on crime of allowing private citizens to carry concealed handguns. The friend, we advised, was planning to buy a book to study up on the subject, but before doing so wanted the subject’s advice on whether the book’s author was a “knowledgeable and trustworthy expert.” Subjects were shown the authors’ *curriculum vitae* CV, which indicated that the author had received a

Ph.D. from one elite university, was on the faculty of another, and was a member of the National Academy of Sciences. The experimental manipulation involved what the author had *written*: for each topic—climate change, nuclear power, and concealed handguns—subjects were randomly assigned a book excerpt in which the author expressed either the “high risk” or “low risk” position (Figure 14). As we hypothesized, subjects were overwhelmingly more likely to find that the author was a “knowledgeable and trustworthy” expert when the author was depicted as taking a position *consistent* with the subjects’ own cultural predisposition than subjects were if the author was assigned the opposing position.

Geologic Isolation of Nuclear Wastes

High Risk
(not safe)

<p>“Using deep geologic isolation to dispose of radioactive wastes from nuclear power plants would put human health and the environment at risk. The concept seems simple: contain the wastes in underground bedrock isolated from humans and the biosphere. The problem in practice is that there is no way to assure that the geologic conditions relied upon to contain the wastes won’t change over time. Nor is there any way to assure the human materials used to transport wastes to the site, or to contain them inside of the isolation facilities, won’t break down, releasing radioactivity into the environment. . . . These are the sorts of lessons one learns from the complex problems that have plagued safety engineering for the space shuttle, but here the costs of failure are simply too high.</p>	 <p>Oliver Roberts Position: Professor of Nuclear Engineering, University of California, Berkeley Education: Ph.D., Princeton University Memberships:</p> <ul style="list-style-type: none"> • American Association of Physics • National Academy of Sciences
---	--

Low Risk
(safe)


<p>“Radioactive wastes from nuclear power plants can be disposed of without danger to the public or the environment through deep geologic isolation. In this method, radioactive wastes are stored deep underground in bedrock, and isolated from the biosphere for many thousands of years. Natural bedrock isolation has safely contained the radioactive products generated by spontaneous nuclear fission reactions in Oklo, Africa, for some 2 billion years. Man-made geologic isolation facilities reinforce this level of protection through the use of sealed containers made of materials known to resist corrosion and decay. This design philosophy, known as ‘defense in depth,’ makes long-term disposal safe, effective, and economically feasible.”</p>	 <p>Oliver Roberts Position: Professor of Nuclear Engineering, University of California, Berkeley Education: Ph.D., Princeton University Memberships:</p> <ul style="list-style-type: none"> • American Association of Physics • National Academy of Sciences
--	--

Figure 14. Is this an expert? In an experiment, subjects were substantially more likely to count a university professor as an “expert” when he was depicted as taking a position consistent with their own cultural predispositions on a risk issue than when he was depicted as taking a position inconsistent with the subjects’ predispositions. Source: Kahan, Jenkins-Smith & Braman (2011).

If individuals are more likely to notice or to assign significance to evidence relating to expert opinion when it supports than when it contradicts their own cultural predispositions, then over time we

should expect people of opposing cultural outlooks to form opposing impressions of what most experts believe. The second piece of evidence from the study showed exactly that. Polling a large representative sample of U.S. adults, we found that culturally diverse citizens had substantially divergent perceptions of expert consensus on climate change, nuclear waste disposal, and gun control. Indeed, we found that egalitarian communitarians and hierarchical individualists also perceived scientific opinion to be different from the position taken in so-called “expert consensus reports” issued by the U.S. National Academy of Sciences in every instance in which the NAS position differed from the one that matched the subjects’ own cultural predispositions. This result seems more consistent with the conclusion that *all* segments of the population are forming culturally biased impressions of what scientists believe than that only one cares about what scientists have to say.

Under these circumstances, the availability effect will interact with cultural worldviews to generate systematic polarization on what experts believe about risk. Asked what “scientific consensus” is on climate change, on nuclear power, or on possession of concealed firearms, individuals will summon to mind all the instances they can recall of experts expressing their views and discover that the overwhelming weight of opinion favors the view consistent with her own cultural predisposition. They’ll reach that conclusion, of course, only because of unconscious bias in their sampling: the fit between an expert’s position and the one congenial to their cultural predisposition is what *causes* them to take note of that expert’s view, to assign significance to it, and thereafter recall it. We all believe that what “most scientists think” about a risk is important. Yet we all tend to overestimate how uniformly scientists believe what we are predisposed to believe is true.

4.4. Cultural credibility heuristic

Most people (in fact, all, if one thinks about it) cannot determine for themselves just how large a disputed risk is, whether of environmental catastrophe from global warming, of human illness from consumption of genetically modified foods, of accidental shootings from gun ownership, etc. They must defer to those whom they find credible to tell them which risk claims and supporting evidence to believe and which to disbelieve. The cultural credibility heuristic refers to the hypothesized tendency of individuals to

impute the sorts of qualities that make an expert credible—including knowledge, honesty, and shared interest—to the people whom they perceive as sharing their values.

One study we did that at least makes a start at testing this hypothesis focused on the HPV vaccine. HPV, or the human papillomavirus, is a sexually transmitted disease that is extremely common among young women: it's estimated that as many as 45% of those in their early 20's have been infected by it (testing permits detection only in women). It is also the leading (effectively, the *only*) cause of cervical cancer. The FDA recently approved a vaccine for females. Public health officials recommend that the vaccine be administered by age 12, before girls are likely to become sexually active, because once a female has been exposed to HPV the vaccine won't do any good. Many states in the US are now considering legislation to require HPV vaccination as a condition of school attendance. These provisions have provoked resistances from groups who argue that vaccination, by furnishing protection against one sort of STD, will increase the incidence of unprotected sex and thus put young girls at risk of other STDs, including HIV. Opponents of mandatory vaccination also cite the risk of unanticipated, harmful side-effects from the vaccine. Numerous state legislatures have defeated legislative proposals for such programs and one state legislature, Texas's, has overridden the creation of a program created by a gubernatorial executive order.

We studied the HPV-vaccine risk perceptions of 1,500 Americans (Kahan, Braman, Cohen, Gastil & Slovic in press). The sample was divided into three groups. One was supplied no information about the HPV vaccine. Another was furnished balanced information in the form of opposing arguments on whether its benefits outweighed its risks.

The final group was exposed to the same arguments, which in this treatment were attributed to fictional, culturally identifiable experts, who were described as being on the faculties of major universities. We created the advocates in pretests. We showed one set of pretest subjects pictures of individuals, and asked them to try to guess how the pictured individuals would respond to our culture items. We then asked another group of pretest subjects to guess the fictional experts' cultural values after looking at both pictures and mock publication lists. We ended up with four culturally identifiable policy experts whose

perceived cultural values located them in the quadrants defined by the intersection of group and grid (). In the actual experiment, subjects (ones who had not previously participated in the pretests creating the culturally identifiable experts) were asked what they thought about the risks and benefits of the HPV vaccine after reading the opposing arguments, which were randomly matched with two of the four experts.

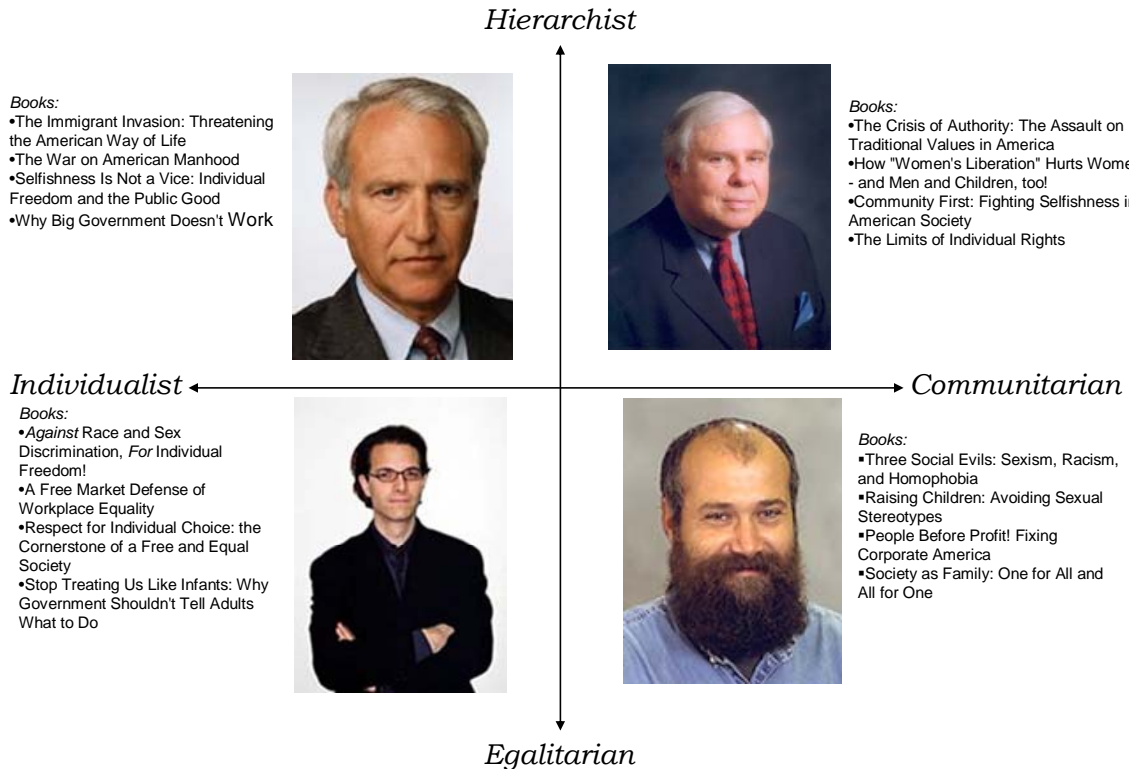


Figure 15. Culturally identifiable advocates. On basis of pretests, fictional “experts” are perceived to have values characteristic of those defined by quadrants demarked by intersection of group and grid. Source ((Kahan, Braman, Cohen, Gastil & Slovic in press).

The results (Figure 16) suggested the operation of various mechanisms of cultural cognition. In the “no information” condition, there was already a division in the views of hierarchal individualists and egalitarian communitarians on whether the vaccine is safe. As we had hypothesized, hierarchs and individualists were motivated to see the risks as large, the former because of their association of the vaccine with premarital sex and the latter because of their opposition to state-sponsored public health measures; whereas egalitarians and communitarians were motivated to see the risks as small, the former because they would see opposition as motivated by hierarchical sexual norms and the latter because they favor state-mandated public health measures. This is an identity-protective-cognition effect.

“The HPV vaccine is safe for use among young girls...”

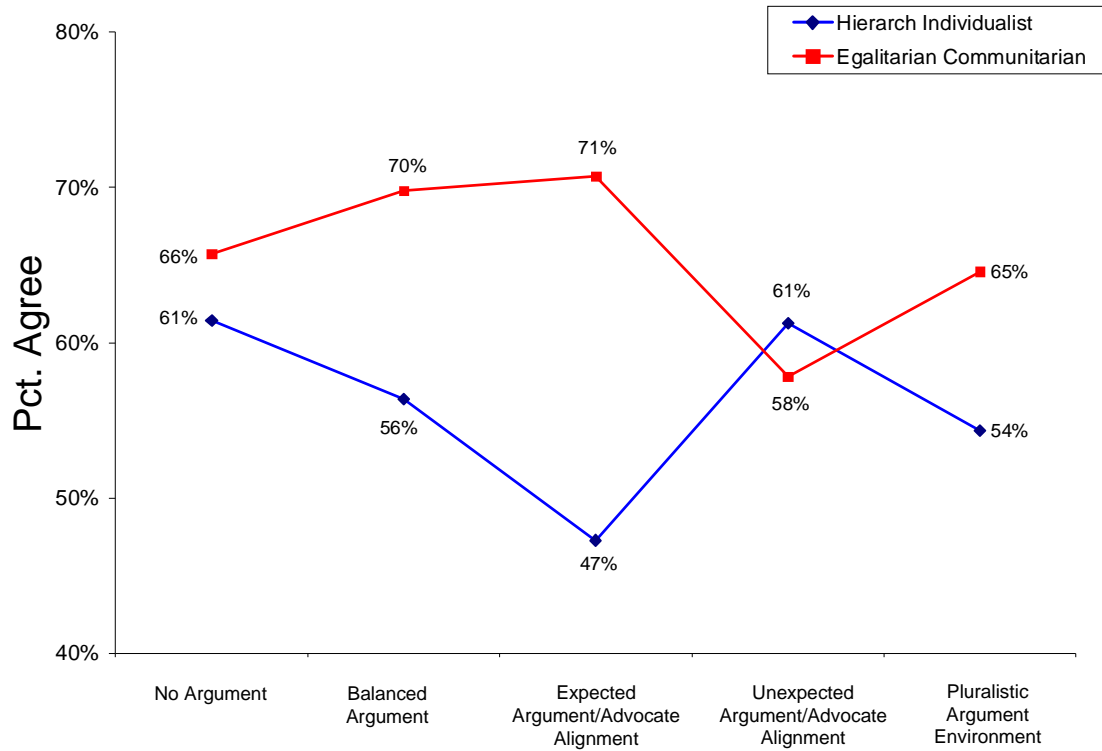


Figure 16. Impact of information and advocates on perceptions of HPV-vaccine risk. *N* = 1,500. Gap between hierarchical individualists and egalitarian communitarians is significantly greater ($p < 0.05$) in “Balanced Argument” relative to “No Argument”; and in “Expected Argument/Advocate Alignment” relative to “Balanced Argument”; it is significantly smaller ($p < 0.05$) in both “Unexpected Argument/Advocate Alignment” and “Pluralistic Argument Environment” relative to “Expected Argument/Advocate Alignment.”

These divisions grew in the “information without advocate” conditions. This is a biased assimilation and polarization effect.

In the “information with advocate” condition, the position of subjects was highly conditional on the congeniality of the experts’ values to the subjects. Where subjects received the argument they were culturally disposed to accept from an expert whose values they shared, and the argument they were culturally predisposed to reject from an expert whose values they opposed—call this the expected alignment condition—polarization grew. But where subjects received the argument they were culturally disposed to reject from the expert whose values they opposed, and the argument they were culturally predisposed to reject from the expert whose values they shared—call this the unexpected alignment condition—there

was a significant decrease in polarization. Indeed, individualists and communitarians in this condition swapped places. This is powerful evidence, then, supporting the cultural credibility heuristic.

We also found out something else important. In what might be called the “pluralistic advocacy condition,” subjects observed opposing advocates whose cultural worldviews were equally proximate to or remote from their own. In this condition, polarization was also significantly diminished relative to “expected alignment” condition. In effect, confronted with a policy-advocate alignment that seemed to confound any inference that the issue was one that divided their cultural group and a competing one, individuals of diverse worldviews were less likely to polarize when they evaluated the advocates’ arguments. Presumably, this is a more realistic state of affairs to aspire to than one in which experts and arguments are aligned in a manner radically opposed to what one would expect.

Accordingly, one might identify the creation of a “pluralistic advocacy condition”—one in which risk communicators self-consciously recruit communicators of diverse cultural outlooks and are careful to *avoid* selecting ones whose identities or styles of argumentation infuse an issue with a meaning of competition or conflict between identifiable groups—as one way of *counteracting* cultural cognition. In such an environment, individuals might still disagree about the facts on risks, but they are less likely to do so along strictly cultural lines. Work on cultural cognition, then, helps to explain not only *why* we see cultural polarization on risks; it also suggests “cultural debasing” strategies—science communication techniques that make it more likely that individuals of diverse cultural outlooks will attend to information in an open-minded way.

4.3. Cultural identity affirmation

The next mechanism, cultural-identity affirmation, also can be seen as a type of “cultural debasing” strategy. This one is based on self-affirmation, a mechanism which is essentially the mirror image of identity-protective cognition and which has been extensively documented by Geoff Cohen, one of the Cultural Cognition Project members (Cohen, Sherman, Bustard, Hsu & McGee & Ross 2007; Cohen, Aaronson & Steele 2000). Identity-protective cognition posits that individuals react dismissively to information that is discordant with their values as a type of identity self-defense mechanism. With self-

affirmation, individuals experience a stimulus—perhaps being told they scored high on a test, or being required to write a short essay on their best attributes—that makes a worthy trait of theirs salient to them. This affirming experience creates a boost in a person’s self-worth and self-esteem that essentially buffers the sense of threat he or she would otherwise experience while confronted with information that challenges beliefs dominant within an important reference group. As a result, individuals react in a more open-minded way to potentially identity-threatening information, and often experience a durable change in their prior beliefs.

Cultural-identity affirmation hypothesizes that you can get the same effect when you communicate information about risk in a way that affirms rather than threatens their cultural worldview. We tested this hypothesis in an experiment involving global warming (Cultural Cognition Project 2007). In the experiment, two groups of subjects all were asked to read a newspaper article that reported a study issued by a panel of scientists from major universities who found definitive evidence that the temperature of the earth is increasing, that the cause of the increase is man made, and that the consequences of continued global warming would be catastrophic for the environment and the economy (Figure 17). In one treatment group, the newspaper article indicated that the study had called for the institution of stronger anti-pollution controls, a policy proposal *threatening* to the identity of individualists and hierarchs. In the other treatment, however, the newspaper article reported that the study had proposed removal on restrictions on nuclear power, so that American society could substitute nuclear power for greenhouse-gas emitting fossil fuel energy sources. Nuclear power is *affirming* to the identity of individualists and hierarchs. Obviously, the proposed policy solution to the problem of climate change bears no logical or empirical relationship to whether the earth is heating up, whether man is causing the temperature rise, and whether global warming will have bad environmental and economic consequences. Nevertheless, consistent with the cultural-identity affirmation hypothesis, we found that individualists and hierarchs were both significantly more likely to credit the reported studying findings on these facts in the nuclear power than in the anti-pollution condition (Figure 18).

Scientific Panel Recommends Anti-Pollution Solution to Global Warming

By Jeffrey Cohen
November 15, 2006

The American Academy of Environmental Scientists, a panel consisting of leading U.S. experts, today recommended stronger anti-pollution regulations as a response to global warming.

"Fossil fuels such as coal, natural gas, and oil are the leading cause of global warming," explained Dr. Jonathan Brastil, head of the Academy. "To reduce the volume of heat-trapping gas generated by such fuels, we strongly recommend that the government adopt stronger anti-pollution regulations, strengthening ones adopted in 1970s and 1980s." Brastil said.

The group's recommendation was made in a report that examined the extent and causes of global warming and the likely consequences that would occur if global warming were not reversed.

Highlights of AAES Report

- Scientific evidence furnishes **irrefutable proof** of global warming. Some of the most obvious effects are visible in the Arctic, where rising temperatures and melting ice have dramatically changed the region's unique landscapes and wildlife.
- Global warming is **caused by** carbon dioxide and other heat-trapping gases that are emitted primarily by the burning of **fossil fuels**. These gases remain in our atmosphere for decades or even centuries.
- If it continues, global warming could have **catastrophic environmental and economic consequences**. Among the results will be extreme heat and drought, rising sea levels, and higher-intensity tropical storms. Such conditions will endanger coastal property and resources, diminish the habitability of major cities, and curtail the productivity of our farms, forests, and fisheries.
- Fossil fuels such as coal, natural gas, and oil are the leading cause of global warming. Accordingly, we strongly recommend that government adopt **stronger anti-pollution regulations** to reduce the volume of heat-trapping gas generated by such fuels.

Scientific Panel Recommends Nuclear Power Solution to Global Warming

By Jeffrey Cohen
November 15, 2006

The American Academy of Environmental Scientists, a panel consisting of leading U.S. experts, today recommended revitalization of the nation's nuclear power industry as a response to global warming.

"Fossil fuels such as coal, natural gas, and oil are the leading cause of global warming," explained Dr. Jonathan Brastil, head of the Academy. "To reduce reliance on such fuels, we strongly recommend broad scale commercial development of nuclear power, including the repeal of government regulations from the 1970s and 1980s that now discourage private investment in the nuclear industry." Brastil said.

The group's recommendation was made in a report that examined the extent and causes of global warming and the likely consequences that would occur if global warming were not reversed.

Highlights of AAES Report

- Scientific evidence furnishes **irrefutable proof of global warming**. Some of the most obvious effects are visible in the Arctic, where rising temperatures and melting ice have dramatically changed the region's unique landscapes and wildlife.
- Global warming is **caused by** carbon dioxide and other heat-trapping gases that are emitted primarily by the burning of **fossil fuels**. These gases remain in our atmosphere for decades or even centuries.
- If it continues, global warming could have **catastrophic environmental and economic consequences**. Among the results will be extreme heat and drought, rising sea levels, and higher-intensity tropical storms. Such conditions will endanger coastal property and resources, diminish the habitability of major cities, and curtail the productivity of our farms, forests, and fisheries.
- Fossil fuels such as coal, natural gas, and oil are the leading cause of global warming. To reduce reliance on such fuels, we strongly recommend the **broad scale commercial development of nuclear power**, which does not emit any heat-trapping gasses. We urge **repeal of government regulations that discourage investment** in this form of energy.

Figure 17. Alternative versions of newspaper article reporting scientific findings on climate change. Subjects were assigned to one of three conditions. In two, they read one of the featured newspaper articles, each of which summarized scientific findings, in the red inset, indicating that climate change was occurring, was caused by humans, and was likely to have catastrophic effects unless reversed. Subjects in the third, control condition read a newspaper article about debate on the need for a new traffic signal at a busy intersection. Source: Cultural Cognition Project (2007).

Indeed, we found that individualists and hierarchs who received the newspaper report that recommended anti-pollution controls were even more skeptical of the reported factual findings of the study than were individualists and hierarchs in a control group who received no newspaper story on the findings of the scientists. This is biased assimilation with a vengeance.

The practical lesson, then, is pretty clear. Don't simply bombard people with information if you are trying to make them more receptive to risks. Doing that can actually provoke a cultural-identity-protective backlash that makes certain groups even more disposed to disbelieve that the risk is a real or a serious one. Information can help, but it has to be framed in a way that *affirms* rather than threatens the

cultural identities of potential risk skeptics. One way of doing that is through policy solutions that are culturally affirming of the skeptics' identities.⁴

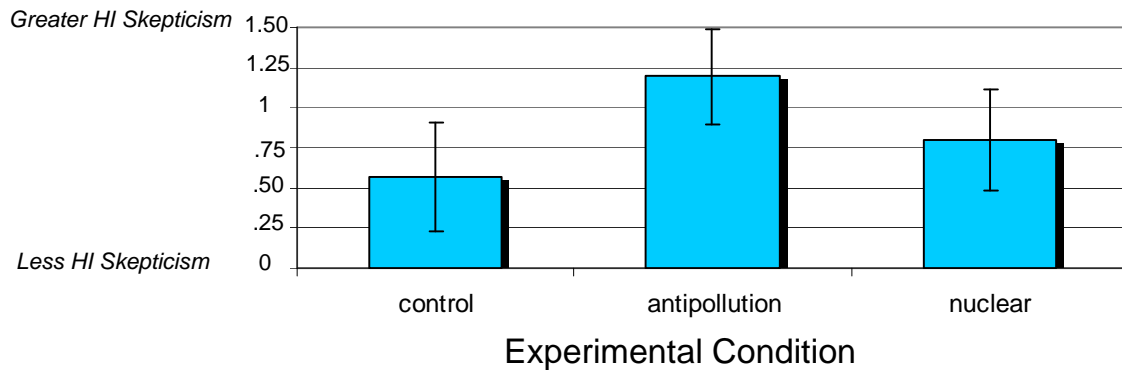


Figure 18. Effect of framings on hierarchical-individualist skepticism on global warming facts. $N = 500$. Bars denote the size of the difference between egalitarian and hierarchical individualist subjects' beliefs in climate change facts, as measured by z-scores on a composite scale that combined responses to questions on whether climate change is occurring, whether it is caused by human activity, and whether it would have adverse environmental impacts if not contained or reversed. Derived from linear multivariate regression in which worldviews and experimental condition were treated as predictors. Confidence intervals reflect 0.95 level of confidence. Source: Cultural Cognition Project (2007).

Or in other words, don't try to convince people to accept a solution by showing them there is a problem. Show them a solution they find culturally affirming, and then they are disposed to believe there really is a problem in need of solving.

5. Collective management of cultural bias

Discussion of the last two mechanisms suggests yet another distinction between cultural cognition and various other conceptions of the cultural theory of risk. Cultural cognition suggests that the influence of worldviews on risk perceptions can be collectively managed in a manner that simultaneously advances the interests of persons of all cultural persuasions.

⁴ The finding that hierarchical and individualistic subjects were least skeptical in the no-information "control" condition might be thought to support the conclusion that individuals should be furnished no information at all. But this conclusion is neither realistic—who exactly would in a position to exert such control over what people learn?—nor normatively appropriate: In a democracy, citizens *should* be furnished with information *in the form least likely to provoke identity-protective cognition* or any other dynamic that interferes with their most reflective assessment of such information.

The meta-worldview of Douglas and Wildavsky features necessary and permanent cultural conflict. Because there is no culture-free perspective, it is not possible for individuals to “overcome” reliance on their worldviews in apprehending risks. As a result, it is not possible for *society* to overcome the persistent struggle of opposing cultural groups to designate forms of behaviors associated with their rivals as sources of danger that must be repressed. One or another group might gain the upper hand, and thus impose its view, at least for a time. One might even form a temporary rooting interest for one or another on grounds that are seemingly utilitarian in nature (Wildavsky 1991). But the idea of brokering a peace between them—of formulating a positive-sum outcome to their bitter competition—would seem to defy the logic of cultural theory.

Cultural cognition is more catholic. Nothing in its account of the mechanisms that connect culture to risk perceptions implies that those dynamics are exclusive of others that might inform individual apprehension of risk. Nor does anything in that account entail that the contribution that alternative cultural worldviews make to risk perception are static and relentlessly oppositional.

This stance, then, creates the possibility, at least as a matter of theory, that adherents to competing ways of life might converge on shared understandings of societal risk and the most effective means for abating them. One strategy for promoting such an outcome involves the adroit framing of information, and of policies, to make them bear a plurality of meanings that can be simultaneously endorsed by opposing cultural groups. There are seeming historical examples of this dynamic—ones involving convergence of cultural groups on environmental policies in the U.S. and abortion policy in France, for example—which my collaborators and I call “expressive” or “social meaning overdetermination” (Kahan & Braman 2006; Kahan 2007). Working within the logic of cultural cognition, we have tried to systematize “social meaning overdetermination” as a strategy for generating positive-sum solutions to cultural conflicts in political life. At least one other group of scholars working within the broad outlines of “group-grid” theory have proposed a similar approach, which they call “clumsy solutions.” (Verweij & Thompson 2006).

Another strategy, one unique to cultural cognition and reflecting its emphasis on mechanisms, suggests the value of structuring democratic deliberation in ways that effectively lessen participants' *reliance* on culture. Many of the mechanisms of cultural cognition involve the use of cultural cues as a heuristic or mental short-cut. But as experimental studies show, it's possible to disable or blunt culture's heuristic influence: when people's cultural identities are affirmed, they don't experience the threatening affective response, or are less influenced by it, as they consider information that challenges beliefs that predominate in their group; when they can't discern a consistent connection between the cultural identity of advocates and positions on some risk issue, they can't simply adopt the position of the advocate whom they perceive as having values most like theirs. At least in theory, then, it should be possible to build into policymaking institutions and procedures devices that similarly stifle the sorts of cues that the mechanisms of cultural cognition depend on. When that happens, individuals will be forced to process information in a different way, maybe in a more considered way, or maybe in a way that reflects other cues that are reliable but not culturally valenced. In the resulting deliberative environment, individuals might not immediately converge on one set of factual beliefs about risks and risk mitigation. But they won't spontaneously split into opposing cultural factions on those matters.

If there is a meta-worldview for cultural cognition, it is that this state of cultural *depolarization* is a good thing (Kahan 2007). It's a good thing, to begin, morally speaking. Because culturally infused disagreements over global warming, gun control, vaccination of school girls for HPV, and the like *is* experienced by all as a form of conflict between contesting cultural factions, the polarizing effect of cultural cognition poses a distinctive sort of threat to liberal political life.

But neutralizing cultural polarization is also a good thing instrumentally speaking. Nothing in cultural theory, as Wildavsky and Douglas originated it or as it has been refined thereafter, implies that there are no real facts about risk or that we can't, through the best information we can discover on the workings of our world, form better or worse understandings of those facts. Regardless of their differences about the ideal society, hierarchs and egalitarians, communitarians and individualists all have a stake in policymaking being responsive to that information; regardless of what lives they want to live, they can all live those

lives better when their health is not threatened by contamination of their food or air, when their economy is insulated from disruptive influences (including governmental ones), and when they are free of domestic and external security threats. These culturally diverse citizens then would presumably all agree that they ought to structure their political institutions and processes in a manner that counter cultural polarization on issues of risk, because when society is culturally polarized the best understandings we have about risk are *less* likely to become operative as *soon* as they would otherwise.

Or at least they sometimes would agree, behind a cultural veil of ignorance as it were, that that's what they want. The possibility of self-consciously managing cultural cognition presents a host of complicated moral questions in large part because the moral status of beliefs we form as a result of our cultural identities is complicated. Only a fool—a moral idiot—would regard those beliefs as *uniformly* unworthy of his or her endorsement. We don't *just* want to live or even live well (in a material sense); we also want to live virtuously and honorably. There's no way to figure out how to do that, I am convinced, without certain moral insights that *only* cultural infused modes of perception can afford (Kahan 2010).

So part and parcel of any project to manage cultural cognition is an informed moral understanding of when, as individuals and as a democratic society, we *should* be responsive to cultural cognition and when we *shouldn't*. Like Douglas and Wildavsky, I don't think it makes any sense to believe we can “overcome” our cultural commitments in considering that issue. But I see nothing that makes me believe that persons of diverse cultural persuasions will inevitably be driven into irreconcilable disagreement over how to resolve it. Until I *am* presented with evidence that forces me to accept that sad conclusion, I will pursue a conception of cultural theory that sees dissipating conflict over risk as the very point of explaining it.

References

- Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, Calif.: Sage Publications.
- Balkin, J. M. (1998). *Cultural Software*. New Haven: Yale Univ. Press.
- Boudon, R. (1998). Social Mechanisms Without Black Boxes. In P. Hedström & R. Swedberg (Eds.), *Social Mechanisms: An Analytical Approach to Social theory* (pp. 172-203). Cambridge, England: Cambridge Univ. Press.
- Braman, D., Kahan, D. M., & Grimmelmann, J. (2005). Modeling Facts, Culture, and Cognition in the Gun Debate. *Soc. J. Res.*, 18, 283-304.
- Cohen, G. L. (2003). Party over Policy: The Dominating Impact of Group Influence on Political Beliefs. *J. Personality & Soc. Psych.*, 85(5), 808-822.
- Cohen, G. L., Aronson, J., & Steele, C. M. (2000). When Beliefs Yield to Evidence: Reducing Biased Evaluation by Affirming the Self. *Personality and Social Psychology Bulletin*, 26(9), 1151-1164.
- Cohen, G. L., Bastardi, A., Sherman, D. K., Hsu, L., McGoey, M., & Ross, L. (2007). Bridging the partisan divide: Self-affirmation reduces ideological closed-mindedness and inflexibility in negotiation. *Journal of Personality and Social Psychology*, 93(3), 415-430.
- Deuteronomy 28:22* (1997). In *New American Standard Bible*.
- Dake, K. (1990). Technology on trial: Orienting dispositions toward environmental and health standards. Ph.D. dissertation. University of California at Berkeley, Berkeley, Calif.
- Dake, K. (1991). Orienting Dispositions in the Perception of Risk: An Analysis of Contemporary Worldviews and Cultural Biases. *J. Cross-Cultural Psych.*, 22, 61.
- Dake, K. (1992). Myths of Nature: Culture and the Social Construction of Risk. *Journal of Social Issues*, 48(4), 21-37.
- Douglas, M. (1966). *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*.
- Douglas, M. (1970). *Natural symbols: explorations in cosmology*. London,: Barrie & Rockliff the Cresset P.
- Douglas, M. (1982). *In the active voice*. London ; Boston: Routledge & K. Paul.
- Douglas, M. (1985). *Risk Acceptability According to the Social Sciences*. New York: Russell Sage Foundation.
- Douglas, M. (1986). *How Institutions Think* (1st ed.). Syracuse, N.Y.: Syracuse University Press.
- Douglas, M. (1992). *Risk and Blame: Essays in Cultural Theory*. London ; New York: Routledge.
- Douglas, M. (1997). The Depoliticization of Risk. In R. J. Ellis & M. Thompson (Eds.), *Culture Matters: Essays in Honor of Aaron Wildavsky* (pp. 121-132). Boulder, Colo.: Westview Press.

- Douglas, M. (2003). Being fair to hierarchists. *University of Pennsylvania Law Review*, 151(4), 1349-1370.
- Douglas, M., & Wildavsky, A. B. (1982). *Risk and culture: An essay on the selection of technical and environmental dangers*. Berkeley: University of California Press.
- Ellis, R. J., & Thompson, F. (1997). Culture and the Environment in the Pacific Northwest. *American Political Science Review*, 91(4), 885-898.
- Elster, J. (1985). *Making Sense of Marx*. Cambridge, England: Cambridge Univ. Press.
- Finucane, M., Slovic, P., Mertz, C. K., Flynn, J., & Satterfield, T. A. (2000). Gender, Race, and Perceived Risk: The "White Male" Effect. *Health, Risk, & Soc'y*, 3(2), 159-172.
- Gastil, J., Jenkins-Smith, H. & Silva, C. Analysis of Cultural Bias Survey Items (Institute for Public Policy, University of New Mexico, 1995).
- Giner-Sorolla, R., & Chaiken, S. (1997). Selective Use of Heuristic and Systematic Processing Under Defense Motivation. *Personality and Social Psychology Bulletin*, 23(1), 84-97.
- Gross, J. L., & Rayner, S. (1985). *Measuring Culture: A Paradigm for the Analysis of Social Organization*. New York: Columbia University Press.
- Jenkins-Smith, H. (2001). Modeling Stigma: An Empirical Analysis of Nuclear Waste Images of Nevada. In J. Flynn, P. Slovic & H. Kunreuther (Eds.), *Risk, media, and stigma : understanding public challenges to modern science and technology* (pp. 107-132). London ; Sterling, VA: Earthscan.
- Jenkins-Smith, H. C., & Herron, K. G. (2009). Rock and a Hard Place: Public Willingness to Trade Civil Rights and Liberties for Greater Security. *Politics & Policy*, 37(5), 1095-1129.
- Judd, C. M. (2000). Everyday Data Analysis in Social Psychology: Comparisons of Linear Models. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 370-392). New York: Cambridge University Press.
- [Kahan, D. M. \(2007\). The Cognitively Illiberal State. *Stan. L. Rev.*, 60, 115-154.](#)
- [Kahan, D. M. \(2008\). Two Conceptions of Emotion in Risk Regulation. *Univ. Pa. L. Rev.*, 156, 741-766.](#)
- [Kahan, D. M., & Braman, D. \(2003\). Caught in the crossfire: A defense of the cultural theory of gun-risk perceptions - Response. *University of Pennsylvania Law Review*, 151\(4\), 1395-1416.](#)
- [Kahan, D. M., & Braman, D. \(2003\). More Statistics, Less Persuasion: A Cultural Theory of Gun-Risk Perceptions. *U. Pa. L. Rev.*, 151, 1291-1327.](#)
- [Kahan, D. M., & Braman, D. \(2006\). Cultural Cognition of Public Policy. *Yale J. L. & Pub. Pol'y*, 24, 147-170.](#)
- [Kahan, D. M., Braman, D., Cohen, G. L., Gastil, J., & Slovic, P. \(2010\). Who Fears the HPV Vaccine, Who Doesn't, and Why? An Experimental Study of the Mechanisms of Cultural Cognition. *L. & Human Behavior* 34, 501-16, on-line publication, <http://dx.doi.org/10.1007/s10979-009-9201-0>.](#)

- [Kahan, D. M., Braman, D., Gastil, J., Slovic, P., & Mertz, C. K. \(2007\). Culture and Identity-Protective Cognition: Explaining the White-Male Effect in Risk Perception. *Journal of Empirical Legal Studies*, 4\(3\), 465-505.](#)
- [Kahan, D. M., Braman, D., Monahan, J., Callahan, L., & Peters, E. \(2010\). Cultural Cognition and Public Policy: The Case of Outpatient Commitment Laws *L. & Human Behavior*, 34, 118-140.](#)
- [Kahan, D. M., Braman, D., Slovic, P., Gastil, J., & Cohen, G. \(2009\). Cultural Cognition of the Risks and Benefits of Nanotechnology. *Nature Nanotechnology*, 4\(2\), 87-91.](#)
- [Kahan, D. M., Slovic, P., Braman, D., & Gastil, J. \(2006\). Fear of Democracy: A Cultural Critique of Sunstein on Risk. *Harvard Law Review*, 119, 1071-1109.](#)
- [Kahan, D.M., Jenkins-Smith, H.C. & Braman, D. \(2011\). Cultural Cognition of Scientific Consensus. *Journal of Risk Research* 14, 147-74, on-line publication <http://dx.doi.org/10.1080/13669877.2010.511246>](#)
- Kahneman, D., & Tversky, A. (1982). Availability: A Heuristic for Judging Frequency and Probability. In D. Kahneman, P. Slovic & A. Tversky (Eds.), *Judgment Under Uncertainty: Heuristics and Biases* (pp. 163-178). Cambridge ; New York: Cambridge University Press.
- Langford, I. H., Georgiou, S., Bateman, I. J., Day, R. J., & Turner, R. K. (2000). Public Perceptions of Health Risks from Polluted Coastal Bathing Waters: A Mixed Methodological Analysis Using Cultural Theory. *Risk Analysis*, 20(5), 691-704.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased Assimilation and Attitude Polarization - Effects of Prior Theories on Subsequently Considered Evidence. *Journal of Personality and Social Psychology*, 37(11), 2098-2109.
- Mamadouh, V. (1999). Grid-Group Cultural theory: An Introduction. *GeoJournal*, 47, 395-409.
- Manton, K. G., Woodbury, M. A., Stallard, E., & Corder, L. S. (1992). The Use of Grade-of-Membership Techniques to Estimate Regression Relationships. *Sociological Methodology*, 22, 321-381.
- Marris, C., Langford, I. H., & O'Riordan, T. (1998). A Quantitative Test of the Cultural Theory of Risk Perceptions: Comparison with the Psychometric Paradigm. *Risk Analysis*, 18(5), 635-647.
- Nisbett, R. E. (2003). *The geography of thought: How Asians and Westerners think differently--and why*. New York: Free Press.
- O'Connor, R. E., Bord, R. J., & Fisher, A. (1998). Rating Threat Mitigators: Faith in Experts, Governments, and Individuals Themselves to Create a Safer World. *Risk Analysis*, 18(5), 547-556.
- Peters, E., & Slovic, P. (1996). The Role of Affect and Worldviews as Orienting Dispositions in the Perception and Acceptance of Nuclear Power. *Journal of Applied Social Psychology*, 26(16), 1427-1453.
- Rayner, S. (1992). Cultural Theory and Risk Analysis. In S. Krimsky & D. Golding (Eds.), *Social Theories of Risk* (pp. pp. 83-115). Westport, Conn.: Praeger.

- Silva, C. L., & Jenkins-Smith, H. C. (2007). The Precautionary Principle in Context: U.S. and E.U. Scientists' Prescriptions for Policy in the Face of Uncertainty*. *Social Science Quarterly*, 88(3), 640-664.
- Sjöberg, L. (1998a). Explaining risk perception: an empirical evaluation of cultural theory. In R. E. Löfstedt & L. Frewer (Eds.), *The Earthscan Reader in Risk and Modern Society* (Vol. 2, pp. 115-132). London: Earthscan.
- Sjöberg, L. (1998b). World Views, Political Attitudes, and Risk Perception. *Risk: Health, Safety and Environment*, 9, 137-152.
- Steg, L., & Sievers, I. (2000). Cultural Theory and Individual Perceptions of Environmental Risks. *Environment and Behavior*, 32(2), 250-269.
- Thompson, M., Ellis, R., & Wildavsky, A. (1990). *Cultural Theory*. Boulder Colo.: Westview Press.
- Verweij, M., & Thompson, M. (Eds.). (2006). *Clumsy Solutions for a Complex World: Governance, Politics, and Plural Perceptions*. Houndmills, Basingstoke, Hampshire, New York: Palgrave Macmillan.
- Verweij, M., Douglas, M., Ellis, R., Engel, C., Hendriks, F., Lohmann, S., et al. (2006). Clumsy Solutions for a Complex World: The Case of Climate Change. *Public Administration*, 84(4), 817-843.
- Wildavsky, A. B. (1991). *The Rise of Radical Egalitarianism*. Washington, D.C.: American University Press.
- Wildavsky, A., & Dake, K. (1990). Theories of Risk Perception: Who Fears What and Why? *Daedalus*, 114, 41-60.