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Media Discourse and Public Opinion on Nuclear Power: A Constructionist Approach¹

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Media discourse and public opinion are treated as two parallel systems of constructing meaning. This paper explores their relationship by analyzing the discourse on nuclear power in four general audience media: television news coverage, newsmagazine accounts, editorial cartoons, and syndicated opinion columns. The analysis traces the careers of different interpretive packages on nuclear power from 1945 to the present. This media discourse, it is argued, is an essential context for understanding the formation of public opinion on nuclear power. More specifically, it helps to account for such survey results as the decline in support for nuclear power before Three Mile Island, a rebound after a burst of media publicity has died out, the gap between general support for nuclear power and support for a plant in one's own community, and the changed relationship of age to support for nuclear power from 1950 to the present.

Atoms for peace. Your friend, the atom. Electricity too cheap to meter. Dr. Spock is worried. The Clamshell Alliance. *The China Syndrome*. Images of cooling towers at Three Mile Island. Chernobyl is everywhere. These are nuggets from a public discourse on nuclear power that most of us instantly recognize.

Nuclear power, like every policy issue, has a culture. There is an ongoing discourse that evolves and changes over time, providing inter-

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pretations and meanings for relevant events. An archivist might catalog the metaphors, catchphrases, visual images, moral appeals, and other symbolic devices that characterize this discourse. The catalog would be organized, of course, since the elements are clustered; we encounter them not as individual items but as interpretive *packages*.

On most policy issues, there are competing packages available in this culture. Indeed, one can view policy issues as, in part, a symbolic contest over which interpretation will prevail. This cultural system has a logic and dynamic of its own. Packages ebb and flow in prominence and are constantly revised and updated to accommodate new events. The process by which this issue culture is produced and changed needs to be accounted for in its own right, regardless of any claims that one might make about its causal effect on public opinion.

Parallel to this cultural level is a cognitive one of individuals making sense of the same issue. Individuals bring their own life histories, social interactions, and psychological predispositions to the process of constructing meaning; they approach an issue with some anticipatory schema, albeit sometimes with a very tentative one. Most public opinion studies focus on the aggregate outcomes of this process—that is, attitudes for and against particular policies—and on how such attitudes change over time. The findings suggest which schemata are shared and the relative popularity of different competitors.

Both levels of analysis involve the social construction of meaning. By examining discourse and public opinion as parallel systems, we deliberately avoid making certain causal assumptions. We do not, in this paper, argue that changes in media discourse *cause* changes in public opinion. Each system interacts with the other: media discourse is part of the process by which individuals construct meaning, and public opinion is part of the process by which journalists and other cultural entrepreneurs develop and crystallize meaning in public discourse.

A full exploration of this interaction between media discourse and opinion formation requires an analysis of both systems over several issues. In this paper, our attempt is more modest: to show how changing media discourse on nuclear power provides an essential context for interpreting a variety of survey results on nuclear power. But our argument on how media discourse and public opinion interact will not be clear without a fuller explication of our underlying model.

The Nature of Media Discourse

Public discourse is carried on in many different forums. Rather than a single public discourse, it is more useful to think of a set of discourses that interact in complex ways. On an issue such as nuclear power, there is the

specialist's discourse using journals and other print media aimed at those whose professional lives involve them in the issue. There is the largely oral discourse used by officials who are directly involved in decision-making roles on the issue and by those who attempt to influence them. There is the challenger discourse, providing packages that are intended to mobilize their audiences for some form of collective action.

General audience media, then, are only some of the forums for public discourse on an issue. If one is interested in predicting policy outcomes, they are not necessarily the most important forums. But if one is interested in public opinion, then media discourse dominates the larger issue culture, both reflecting it *and* contributing to its creation. Journalists may draw their ideas and language from any or all of the other forums, frequently paraphrasing or quoting their sources. At the same time, they contribute their own frames and invent their own clever catchphrases, drawing on a popular culture that they share with their audience.

The media, in this model, serve a complex role. They are, on the one hand, part of the process by which issue cultures are produced. Because their role is believed to be so central in framing issues for the attentive public, they are also, to quote Gurevitch and Levy (1985, p. 19), "a site on which various social groups, institutions, and ideologies struggle over the definition and construction of social reality." General audience media are not the only forums for public discourse, but, since they constantly make available suggested meanings and are the most accessible in a media-saturated society such as the United States, their content can be used as the most important indicator of the general issue culture.

Media packages.—We suggested earlier that media discourse can be conceived of as a set of interpretive packages that give meaning to an issue. A package has an internal structure. At its core is a central organizing idea, or *frame*, for making sense of relevant events, suggesting what is at issue. "Media frames," Gitlin (1980, p. 7) writes, "largely unspoken and unacknowledged, organize the world both for journalists who report it and, in some important degree, for us who rely on their reports." This frame typically implies a range of positions, rather than any single one, allowing for a degree of controversy among those who share a common frame. Finally, a package offers a number of different condensing symbols that suggest the core frame and positions in shorthand, making it possible to display the package as a whole with a deft metaphor, catchphrase, or other symbolic device.²

² We distinguish framing devices that suggest how to think about the issue and reasoning devices that justify what should be done about it. The five framing devices are (1) metaphors, (2) exemplars (i.e., historical examples from which lessons are drawn), (3) catchphrases, (4) depictions, and (5) visual images (e.g., icons). The three reasoning devices are (1) roots (i.e., a causal analysis), (2) consequences (i.e., a particular type of

To illustrate, consider a package about the use of nuclear power to generate electricity, one we label *progress*.³

If the electric chair had been invented before the electric light, would we still be using kerosene lamps? There has always been resistance to technological progress by nervous Nellies who see only the problems and ignore the benefits. Resistance to nuclear energy development is the latest version of this irrational fear of progress and change, the expression of modern pastoralists and nuclear Luddites. Certainly nuclear energy development is not free of problems, but problems can be solved, as the history of technological progress shows. The failure to develop nuclear power will retard our economic growth and make us renege on our obligation to the poor and to future generations. If coercive utopians prevent us from moving ahead now with nuclear energy, the next generation is likely to be sitting around in the dark blaming the utilities for not doing something this generation's officials would not let them do.

This package frames the nuclear power issue in terms of the society's commitment to technological development and economic growth. Frames should not be confused with positions for or against some policy measure. While this package is clearly pronuclear, there is ample room for disagreement within the overall frame—for example, on what type of reactors should be built. Not every disagreement is a frame disagreement; differences between (say) Republicans and Democrats or “liberals” and “conservatives” on many issues may reflect a shared frame. Nor can every package be identified with a clear-cut policy position. On almost any issue, there are packages that are better described as ambivalent than as pro or con.

Packages, if they are to remain viable, have the task of constructing meaning over time, incorporating new events into their interpretive frames. In effect, they contain a story line or, to use Bennett's (1975) term, a scenario. The *progress* package, for example, must be able to deal with the accidents at Three Mile Island (TMI) and Chernobyl, providing them with a meaning that is plausible and consistent with the frame. If

effect), and (3) appeals to principle (i.e., a set of moral claims). A package can be summarized in a signature matrix that states the frame, the range of positions, and the eight different types of signature elements that suggest this core in a condensed manner. For a fuller presentation of this part of the model, see Gamson and Lasch (1983).

³ We follow the convention of presenting packages as indented quotations, although they are in fact a combination of paraphrasing and direct quotes from multiple sources. The acid test of a statement of a package should be its acceptance by an advocate that the statement is a fair one. We attempt to meet this test by relying on the language of advocates and sponsors, deriving it from their pamphlets and other writings. In this instance, we paraphrase or quote materials from the Atomic Industrial Forum, the Edison Electric Institute, the Committee on Energy Awareness, and the pronuclear writings of neoconservatives (see Nisbet 1979; McCracken 1977, 1979).

the event is not one that the scenario predicts or expects, this only challenges the ingenuity and suppleness of the skillful cultural entrepreneur.

How does one account for the development of this package and its competitors over time and especially for their relative prominence in media discourse? Our model treats the content of the discourse as the outcome of a value-added process. As an illustration of this concept, consider the example of automobile production. Each stage—the mining of iron ore, smelting, tempering, shaping, assembling, painting, delivering, selling—adds its value to the final product. Furthermore, these stages may be thought of as determinants that, in combination, *specify* the final outcome. In this sense, they “explain” or account for whatever it is that is finally produced.⁴

The production of issue cultures can be thought of as such a process. The model postulates three broad classes of determinants that combine to produce particular package careers: cultural resonances, sponsor activities, and media practices.

A. Cultural resonances: Not all symbols are equally potent. Certain packages have a natural advantage because their ideas and language resonate with larger cultural themes. Resonances increase the appeal of a package; they make it appear natural and familiar. Those who respond to the larger cultural theme will find it easier to respond to a package with the same sonorities. Snow and Benford (1988) make a similar point in discussing the “narrative fidelity” of a frame. Some frames “resonate with cultural narrations, that is, with the stories, myths, and folk tales that are part and parcel of one’s cultural heritage.”⁵

The *progress* package benefits by its resonances with a larger cultural theme of technological progress. Few would question the appeal of a “technofix” for a wide variety of problems in American society. As Williams writes in commenting on American values, “ ‘Efficient’ is a word of high praise in a society that has long emphasized adaptability, technological innovation, economic expansion, up-to-dateness, practicality, expediency, ‘getting things done’ ” (1960, p. 428). The inventor is a central

⁴ The economic model of value added has been used most prominently in sociology by Smelser (1963) in his *Theory of Collective Behavior*. In spite of the influence of this work, the general linear model so dominates the thinking of most American sociologists that they find it difficult to think in value-added terms, immediately attempting to translate such models into the language of dependent and independent variables. But it is confusing rather than helpful to think of an automobile as the dependent variable, while mining, smelting, painting, and delivery are considered independent variables.

⁵ They also use the term “frame resonance,” but to refer to the link between culture and cognition—i.e., to connect the content of a frame and the response of an audience member. In contrast, we use the terms “cultural resonance” and “narrative fidelity” to link different parts of the cultural system—i.e., to connect symbols on a specific issue with more enduring cultural themes.

cultural hero—embodied in the myths about Benjamin Franklin and Thomas Edison. Mastery over nature is the way to progress: good old American ingenuity and know-how.

It is useful to think of themes dialectically. There is no theme without a countertheme. The theme is conventional and normative; the countertheme is adversarial and contentious. But both are rooted in American culture, and both can be important in assessing the outcome of any specific symbolic contest.

American culture also contains a countertheme that is skeptical of, or even hostile to, technology. To quote Emerson, “Things are in the saddle and ride mankind.” Harmony with nature rather than mastery over it is stressed. We live on a “small planet.” Our technology must be appropriate and in proper scale. There is an ecosystem to maintain, and the more we try to control nature through our technology, the more we disrupt its natural order and threaten the quality of our lives. Thoreau at Walden Pond is also part of the American cultural heritage.

Much of popular culture features the countertheme: Chaplin’s *Modern Times*, Huxley’s *Brave New World*, and Kubrick’s *2001* and countless other films about technology gone mad and out of control, a Frankenstein’s monster about to turn on its creator. If *progress* benefits by its resonance with the theme, two of its competitors, *runaway* and *soft paths* (discussed below), draw much of their symbolism from different parts of the countertheme.

Since cultural themes remain constant, it may be unclear how they can help us to explain changes in the ebb and flow of packages in media discourse. Resonances are the earliest stage in the value-added process. A package’s resonances, we argue, facilitate the work of sponsors by tuning the ears of journalists to its symbolism. They add prominence to packages by amplifying the effect of sponsor activities and media practices.

B. Sponsor activities: Much of the changing culture of an issue is the product of enterprise. Packages frequently have sponsors, interested in promoting their careers. Sponsorship is more than merely advocacy, involving such tangible activities as speech making, interviews with journalists, advertising, article and pamphlet writing, and the filing of legal briefs to promote a preferred package.

These sponsors are usually organizations, employing professional specialists whose daily jobs bring them into contact with journalists. Their jobs breed sophistication about the news needs of the media and the norms and habits of working journalists. Indeed, many of these professionals began as journalists before moving to public relations jobs. As Sigal (1973, p. 75) points out, professional sponsors adjust “their thinking to newsmen’s conventions. They talk the same language.”

The sponsor of a package is typically an agent who is promoting some

collective rather than personal agenda. These agents frequently draw on the resources of an organization to prepare materials in a form that lends itself to ready use. Condensing symbols is the journalist's stock-in-trade. Smart sources are well aware of the journalist's fancy for the apt catchphrase and provide suitable ones to suggest the frame they want.

For nuclear power, as on most issues, public officials are often important sponsors. The Atomic Energy Commission and its successor agencies, the Nuclear Regulatory Commission and the Department of Energy, have been important sponsors of the *progress* package. Their efforts have been supplemented by industry groups such as the Atomic Industrial Forum, the Edison Electric Institute, and the Committee on Energy Awareness. A neoconservative advocacy network has helped to articulate and spread this package through its journals.

Social movement organizations are also important sponsors in this framing process. Snow and Benford (1988, p. 198) point out their role as "signifying agents" that are actively engaged in the production of meaning: "They frame . . . relevant events and conditions in ways that are intended to mobilize potential adherents and constituents, to garner bystander support, and to demobilize antagonists."

Major sponsors of antinuclear packages include environmental groups such as Friends of the Earth, consumer protection groups such as Critical Mass, professional groups such as the Union of Concerned Scientists, and direct-action groups such as the Clamshell Alliance. Gamson (1988) argues that the antinuclear movement—through a combination of direct action and more conventional political action—so changed media discourse that the accidents at TMI and Chernobyl were given significantly different frames than they would have received in an earlier discourse context.

C. Media practices: That sponsors are active does not imply that journalists are passive. Journalists' working norms and practices add considerable value to the process. A number of students of American news organizations have argued that journalists unconsciously give official packages the benefit of the doubt. In some cases, official assumptions are taken for granted, but even when they are challenged by sponsors of alternative packages, it is these competitors that bear the burden of proof. A weaker form of this argument is that journalists make official packages the starting point for discussing an issue.

Various observers have noted how subtly and unconsciously this process operates. Halberstam (1979, p. 414) describes how Walter Cronkite's concern with avoiding controversy led to his acceptance of the assumptions underlying official packages: "To him, editorializing was going against the government. He had little awareness, nor did his employers want him to, of the editorializing which he did automatically by uncon-

sciously going along with the government's position." In addition to this tendency to fall into official definitions of an issue, journalists are especially likely to have routine relationships with official sponsors. Most American reporting is the product of ongoing news routines.⁶

Other media norms and practices in the United States—particularly the balance norm—favor certain rivals to the official package. In news accounts, interpretation is generally provided through quotations, and balance is provided by quoting spokespersons with competing views. In the commentary provided by syndicated columnists and cartoonists, norms of balance generally prevail at the aggregate level. While an individual columnist is not expected to provide more than one package, a range of "liberal" and "conservative" commentators are used to observe this norm.

The balance norm is, of course, a vague one, and the practices that it gives rise to favor certain packages over others. Organized opposition to official views is a necessary condition for activating the norm, which, once invoked, encourages the tendency to reduce controversy to two competing positions—an official one and (if there is one) the alternative sponsored by the most vested member of the polity. In many cases, the critics may share the same unstated, common frame as officials.

The balance norm, however, is rarely interpreted to include challenger packages, even when no other alternative is available. Tuchman (1974, p. 112) argues that balance in television news "means in practice that Republicans may rebut Democrats and vice versa," but that "supposedly illegitimate challengers" are rarely offered the opportunity to criticize government statements. Instead, she suggests, reporters search for an "establishment critic" or for a " 'responsible spokesman' whom they have themselves created or promoted to a position of prominence."

But challengers can have an important indirect effect on media discourse. Their own preferred packages may be ignored, but they create the conditions for more established critics to gain media prominence. On nuclear power, as Gamson (1988, p. 235) puts it, "When demonstrators are arrested at Seabrook, phones ring at the Union of Concerned Scientists."

⁶ Sigal (1973) examined over 1,000 stories from the *New York Times* and the *Washington Post* and classified the channels by which the information reached the reporter. *Routine* channels included official proceedings, press releases, press conferences, and scheduled official events. *Informal* channels included background briefings, leaks, nongovernmental proceedings, and reports from other news organizations. Finally, *enterprise* channels included interviews conducted at the reporter's initiative, spontaneous events that a reporter observed firsthand, independent research, and the reporter's own conclusions or analysis. He found that only about one-quarter of the stories came from enterprise channels, while routine channels accounted for almost 60%.

In sum, packages succeed in media discourse through a combination of cultural resonances, sponsor activities, and a successful fit with media norms and practices. Public opinion influences this process indirectly through journalists' beliefs, sometimes inaccurate, about what the audience is thinking. Many journalists straddle the boundary between producers and consumers of meaning. These journalists—editorial writers, cartoonists, opinion columnists, and the like—are not engaged in constructing accounts of raw happenings. They observe and react to the same media accounts, already partly framed and presented in a context of meaning, that are available to other readers and viewers. In their commentary on an issue, they frequently attempt to articulate and crystallize a set of responses that they hope or assume will be shared by their invisible audience.

The Nature of Public Opinion

"Is there anyone out there not thinking about this nightmare of the nuclear age, talking about it, learning from it?" began NBC's Tom Brokaw in one of his daily updates on the Chernobyl nuclear accident. How do ordinary citizens come to understand a complex issue such as nuclear power? On many issues, people encounter relevant phenomena directly rather than through mass-media accounts. They try to understand events in light of what touches their lives. But few of us have experiences with nuclear power.

Ball-Rokeach and DeFleur's "dependency theory" (1976, 1982) suggests that the role of the media in the process of constructing meaning will vary from issue to issue. On some issues, the audience has little experience by which to judge media-generated images and meanings; concerning other issues, they have a great deal. The media-dependency hypothesis suggests that the relative importance of media discourse depends on how readily available meaning-generating experiences are in people's everyday lives.

Even in the apparently limiting case of nuclear power, however, there are more relevant experiences than one might think. Take the issue of evacuation plans in the event of nuclear accidents. In Boston, for example, virtually everyone is aware of how a single automobile accident on the central artery can paralyze traffic in and out of the city for hours. They can bring this type of practical knowledge to bear in evaluating the realism of nuclear evacuation plans.⁷ Even concerning nuclear power, then, media dependency is far from complete.

⁷ This example is drawn from research in progress in which we construct peer groups to discuss nuclear power and other issues.

However dependent the audience may be on media discourse, they actively use it to construct meaning and are not simply a passive object on which the media work their magic. Swidler (1986, p. 273) invites us to think of culture “as a ‘tool kit’ of symbols, stories, rituals, and world-views, which people may use in varying configurations to solve different kinds of problems.” The problem in this case is to make sense of public affairs. Media discourse, we argue, provides many of the essential tools.

Note that this model of the relationship of media discourse and public opinion does not argue that media discourse causes public opinion to change. But if packages and their elements are essential tools, then it makes a considerable difference that some are more readily available than others. Making sense of the world requires an effort, and those tools that are developed, spotlighted, and made readily accessible have a higher probability of being used.

THE NUCLEAR POWER DISCOURSE

Our analysis focuses on national media discourse and, more specifically, on television network news, major newsmagazine accounts, editorial cartoons, and syndicated columns. We take all relevant material on nuclear power during the limited time periods that we sample. This includes the network evening news broadcasts on ABC, CBS, and NBC; *Time*, *Newsweek*, and *U.S. News and World Report*; and a “saturation” sample of editorial cartoons and syndicated opinion columns that includes virtually all those published during the sample periods.

The cartoons and opinion columns are drawn from a sample of the 10 largest-circulation daily newspapers in each of five regions. We calculate how close we are to saturation by examining each wave of five newspapers and calculating the percentage of new entries that they yield. We define our set as complete when the index of new entries is below 20% for two successive waves. For example, the last 10 newspapers we sampled in 1953 yielded 29 columns but only two that were not already included.

We use our media sample as an indicator of the issue culture that people draw on to construct meaning. We do not, of course, assume that people have watched all three television networks or read the 50 newspapers from which we draw our cartoons and opinion columns. But we do assume that the national issue culture that our media sample reflects is accessible to those who try to make sense of nuclear power, either directly through national media or through local media and personal conversations about the issue.

Ideally, we would want a continuous record of media discourse, with no time gaps. But we also want a record that transcends the idiosyn-

crasies of a given medium. Together, these requirements present overwhelming practical obstacles, and some compromises are necessary.

Our time sampling focuses on what Chilton (1987) calls “critical discourse moments,” which make the culture of an issue visible. They stimulate commentary in the media by sponsors and journalists. With continuing issues such as nuclear power, journalists look for “pegs”—that is, topical events that provide an opportunity for broader, more long-term coverage and commentary. These pegs provide us with a way of identifying those time periods in which issue packages are especially likely to be displayed.

The events we sample typically create some perturbation. Sponsors feel called upon to reassert their preferred packages and to interpret the latest development in light of them. This increases the efficiency of our search by focusing our efforts on periods when commentary is especially dense. But by sampling in this fashion, we end up with a small series of snapshots of media discourse at irregular intervals instead of a movie, which we would prefer. The analysis below necessarily reflects this limitation.

Part of our presentation is based on a systematic content analysis that uses standard coding and reliability techniques. For this, we used a three-digit code that breaks packages down into specific idea elements. For example, within the *progress* package, the code provides such categories as “Underdeveloped nations can especially benefit from peaceful uses of nuclear energy,” “Nuclear power is necessary for maintaining economic growth and our way of life,” and “Nuclear power opponents are afraid of change.” The coder looks for a specific idea such as one of the above rather than making a global judgment on which package it represents. Of course, since the first digit groups subcodes by the overall package, coders find the package distinctions useful in knowing where to search. Two independent coders were used on a sample of material, and distinctions among code categories were not maintained whenever the reliability failed to reach 80%.⁸

Some of our analysis, especially of visual imagery, is more qualitative and interpretive. Here we attempt to present enough rich textual material so that readers can form their own independent judgments on the validity of our argument. Whenever possible, we draw on other analysts who have examined some aspect of nuclear discourse. Since the story is frequently in the details, this necessarily implies a large number of concrete illustrations and a somewhat lengthy presentation.

⁸ For a copy of the complete code used, write to the first author. Further details on the sampling, compiling, and coding process and the reliabilities involved are presented in Gamson and Modigliani (1987, pp. 171–74).

1. The Age of Dualism: From Hiroshima through the 1960s

The culture of nuclear power has been indelibly marked by Hiroshima and Nagasaki. Public awareness begins with the images of sudden, enormous destruction, symbolized in the rising mushroom cloud of a nuclear bomb blast. Even when discourse focuses on the use of nuclear reactors to produce electricity, the afterimage of the bomb is never far from the surface.

Boyer's rich analysis of American nuclear discourse from 1945 to 1950 shows how rapidly these images of unlimited destruction became central. H. V. Kaltenborn, in his NBC evening news broadcast reporting on the first atomic bomb, told his radio audience that "For all we know, we have created a Frankenstein! We must assume that with the passage of only a little time, an improved form of the new weapon we use today can be turned against us" (Boyer 1985, p. 5). *Life* magazine, with over 5 million circulation, devoted much of its August 20, 1945, issue to the bomb, with full-page photographs of the towering mushroom clouds over Hiroshima and Nagasaki. The language that accompanied these frightening images was equally ferocious. Today, fears of extinction, as Boyer points out, "seem so familiar as to be almost trite, but it is important to recognize how *quickly* Americans began to articulate them" (1985, p. 15).

The *progress* package on nuclear energy, described above, was just as quick off the mark. A dualism about nuclear energy is part of its core. Boyer points to the either/or structure of so many post-Hiroshima pronouncements: "Either civilization would vanish in a cataclysmic holocaust, or the atomic future would be unimaginably bright" (1985, p. 125). "We face the prospect either of destruction on a scale which dwarfs anything thus far reported," said the *New York Times* in an editorial a day after Hiroshima, "or of a golden era of social change which would satisfy the most romantic utopian." A Philip Wylie article in the September 1945 *Collier's* was titled "Deliverance or Doom." By September 1945, Dwight Macdonald was already calling such a view an "official platitude": "The official platitude about Atomic Fission is that it can be a Force for Good (production) or a Force for Evil (war), and that the problem is simply how to use its Good rather than its Bad potentialities" (Macdonald 1945, p. 58).

Boyer argues that the faith expressed in the atom's peacetime promise was "part of the process by which the nation muted its awareness of Hiroshima and Nagasaki and of even more frightening future prospects" (1985, p. 127). Not only was it an "anodyne to terror," but it also helped to assuage any lingering discomfort over the destruction that America had already wrought with the fearsome atom. A peace-loving America should embrace the challenge of making the atom "a benevolent servant"

to produce for humankind “more comforts, more leisure, better health, more of real freedom [and] a much happier life” (Waymack 1947, p. 214). Atomic Energy Commission (AEC) chairman Lewis Strauss contributed a phrase that became a permanent part of the issue culture when he told the National Association of Science Writers in 1954 that “It is not too much to expect that our children will enjoy in their homes electrical energy too cheap to meter.”

Not all the discourse that Boyer reviews was equally optimistic. There were certainly cautious skeptics challenging the utopian claims. But this is a debate within a frame, a disagreement over how fast and how easily the promise of nuclear energy will be realized. As long as the issue is framed as a choice between atoms for war and atoms for peace, it is hard to see who could be against nuclear power development.

Nuclear dualism remained essentially unchallenged for the next quarter century. On December 8, 1953, President Eisenhower addressed the United Nations on nuclear power, presenting what media discourse labeled his “atoms for peace” speech. In it, he proposed to make American nuclear technology available to an international agency that would attempt to develop peaceful uses of nuclear energy.

We sampled media material for the two weeks after the UN speech and for a similar period in February 1956, following the issuance of a citizens committee report on the future of nuclear energy.⁹ The Eisenhower speech came at the height of the Cold War and in the midst of the McCarthy era. Much of the discourse that followed focused less on nuclear power and more on how Eisenhower’s clever one-upmanship had embarrassed an obstructionist and militaristic Soviet Union. Nevertheless, we were able to identify 21 columns, 16 cartoons, and 4 news-magazine accounts that did address the issue of nuclear power per se.¹⁰

The *progress* package remains unchallenged throughout this sample of materials. The either/or structure of nuclear dualism is strongly represented. The dominant metaphor is a road that branches into two alternative paths—one leading to the development of weapons of destruction, the other to the eradication of human misery. Again, there are optimists and cautious skeptics who warn that the technological problems in tap-

⁹ The report was issued by a special panel of nine prominent citizens appointed by the Congressional Joint Committee on Atomic Energy. It depicted a future in “which the nation would add immeasurably to its material resources, extend its atomic bounty to the backward and improve the physical well-being of peoples everywhere.” Unfortunately, the report stimulated very little media commentary; our 1950s sample is overwhelmingly composed of items from the 1953 discourse.

¹⁰ No television was available for these early periods. The Vanderbilt Television Archive began recording the evening news broadcasts of the three major networks on August 5, 1968.

ping this energy source for human betterment are formidable and far from solved. But no opposition to nuclear power development is presented, and no alternative package is ever offered.

In the late 1950s and early 1960s, a movement against the atmospheric testing of nuclear weapons called public attention to the long-range dangers of radiation. Milk, "nature's most nearly perfect food," as the dairy industry put it, was found to contain strontium 90. A famous SANE ad warned the public that "Dr. Spock is worried."

Some of this increased awareness about radiation dangers spilled over into concern about nuclear reactors. Local controversies developed over the licensing of some of them, including the Enrico Fermi reactor near Detroit. But these controversies remained local and largely disappeared after the Limited Test Ban Treaty of 1963 ended atmospheric testing of weapons and radiation concerns receded. By the mid-1960s, the nuclear energy industry was enjoying a wave of new orders and no public opposition.

One measure of the dominance of the *progress* package at this time was the lack of attention paid to a serious nuclear accident at the Fermi reactor outside Detroit in the fall of 1966. On October 5, the cooling system failed and the fuel core underwent a partial meltdown.¹¹ The automatic shutdown, or "scram," system failed to operate, and, alerted by alarms signaling the leak of radiation into the containment building, operators shut the plant down manually. As far as we know, there was no radiation leak into the atmosphere, but the shutdown did not remove the major danger of a disastrous secondary accident during the following six months, when people tried to figure out what had happened and to remove the damaged fuel. Fuller (1975) likens the process to "look[ing] inside a gasoline tank with a lighted match." During the danger period, plans for the evacuation of a million or more people were discussed by officials but deemed impractical and unnecessary. By almost any reckoning, the Fermi accident was extremely serious.

Local journalists and officials were notified that something was wrong, but there the story sat, unreported. More than five weeks after the accident, the *New York Times* carried a story on what it labeled a "mishap" at the Fermi reactor.¹² There was nothing in the least alarming in the *Times* account. Walker Cisler, the president of Detroit Edison and the leading force behind the construction of the Fermi reactor, was quoted as saying, "If all goes well, we could start again shortly after the first of the year."¹³

¹¹ We rely here on the detailed account of the Fermi accident by Fuller (1975).

¹² The *New York Times*, November 13, 1966.

¹³ The breeder reactor at Fermi was eventually abandoned, although a conventional light water reactor (Fermi 2) was later built next to it.

A General Electric official classified what happened as “a minor perturbation,” and a reassuring report from the Atomic Industrial Forum was duly noted.

No critic of nuclear power was quoted in the belated *Times* report on the Fermi accident. Indeed, it would have taken great enterprise to have found such a critic in 1966. In effect, there was no significant anti-nuclear-power discourse during this era.¹⁴ Nuclear power was, in general, a nonissue. *Progress* remained the dominant package, so taken for granted in the little public discourse that existed that it required no explicit defense.

2. The Rise of an Antinuclear Discourse: The 1970s to TMI

By the time of the Three Mile Island accident in 1979, media discourse on nuclear power reflected an issue culture in flux. *Progress* was still the most prominent package, but its earlier hegemony had been destroyed.

The much-touted “energy crisis” of the 1970s stimulated the articulation of a second major pronuclear package, *energy independence*. This package drew a pronuclear meaning from the Arab oil embargo of 1973:

The lesson is how dependence on foreign sources for vitally needed energy can make the United States vulnerable to political blackmail. Nuclear energy must be understood in the context of this larger problem of energy independence. To achieve independence, we must develop and use every practical alternative energy source to imported oil, including nuclear energy. Nuclear energy, plus domestic oil, natural gas, and coal, remain the only practical alternatives to a dangerous and humiliating dependence on foreign and, particularly, Middle Eastern sources. These foreign sources are unstable and unreliable and are likely to make unacceptable political demands. Do we want to be dependent on the whims of Arab sheiks? Ultimately, independence is the cornerstone of our freedom.

This addition to the pronuclear arsenal was more than offset by other developments that stimulated the rise of an antinuclear discourse. First, nuclear dualism had been seriously eroded even among many keepers of the faith. With the advent of the Carter administration, proliferation of nuclear weapons became a presidential priority issue. To deal with the proliferation problem, Carter tried to promote stronger international control over the spread of nuclear technology, including reactor technology. Although a strong supporter of nuclear power generally, he turned against the breeder reactor lest the plutonium it produced be diverted to weapons use. Atoms for peace and atoms for war no longer appeared to

¹⁴ From August 5, 1968, through the end of 1969, there was only one 15-second item on nuclear power on the television evening news programs of the three major networks (see Media Institute 1979).

be such separate paths. Subliminal mushroom clouds had begun to gather over even official discourse on the issue.

More important, the dualism was being undermined because of the safety issue. If a serious accident that releases large amounts of radiation into the atmosphere is possible at a nuclear reactor, then the destructive potential of this awesome energy is not confined to bombs.

A broad coalition of anti-nuclear-power groups raised the safety issue but as part of a number of different packages. The environmental wing, epitomized by Friends of the Earth, offered a *soft paths* package:

Split wood, not atoms. Nuclear energy presents us with a fundamental choice about what kind of society we wish to be. Do we wish to continue a way of life that is wasteful of energy, relies on highly centralized technologies, and is insensitive to ecological consequences? Or do we want to become a society more in harmony with its natural environment?

Nuclear energy relies on the wrong kind of technology—centralized and dangerous in the long run to the earth's ecology. We need to pursue alternative, soft paths. We should change our way of life to conserve energy as much as possible and to develop sources of energy that are ecologically safe and renewable, and that lend themselves to decentralized production—for example, sun, wind, and water. Small is beautiful.¹⁵

Other groups, epitomized by the Ralph Nader organization Critical Mass, offered a more populist, anticorporate package, *public accountability*:

If Exxon owned the sun, would we have solar energy? The root of the problem is the organization of nuclear production by profit-making corporations, which minimizes accountability and control by the public. Spokesmen for the nuclear industry are motivated to protect their own economic interests, not the public interest. One cannot rely on what they say. Company officials are frequently dishonest, greedy, and arrogant. Who killed Karen Silkwood?

The nuclear industry has used its political and economic power to undermine the serious exploration of energy alternatives. Public officials, who are supposed to monitor the activities of the industry, are all too often captives of it. They function more to protect the industry than to protect the public.

Finally, the antinuclear movement, through organizations such as the Union of Concerned Scientists, offered a more pragmatic, cost-benefit package, *not cost effective*. A liturgy of unsolved problems and delays are cited, leading to the conclusion that:

When one compares the costs and benefits of nuclear energy with the alternatives, it makes a poor showing. Nuclear power, through nobody's fault in particular, has turned out to be a lemon, and it is foolish to keep pouring

¹⁵ See Lovins (1977) for a particularly influential articulation of this package.

good money after bad by supporting the continued development of nuclear energy.

Media coverage of nuclear power accelerated rapidly in the mid-1970s. The Media Institute study (1979) of network television news reveals a burst of coverage at the time of Earth Day in 1970, followed by very little through 1974. Coverage then tripled in 1975 and doubled again the following year. Except for a temporary decrease in 1978, it continued to increase up to the time of TMI. In the first three months of 1979, before TMI, the networks ran 26 stories related to nuclear power.

We sampled two two-week periods in the 1970s. The first, in 1973, followed a major energy speech by Nixon. Occurring in the midst of Watergate, it drew little commentary and yielded only three opinion columns. The second period, in 1977, coincided with two events: Carter's efforts at gaining international support for controlling the spread of nuclear technology and the arrest and detention for two weeks of more than 1,400 antinuclear demonstrators who occupied the site where the Seabrook, New Hampshire, nuclear reactor was being constructed. This sample produced fifteen television segments, two newsmagazine accounts, six cartoons, and an additional five opinion columns.

Our media samples represent two different forms of discourse. Television and newsmagazines present accounts rather than explicit commentary. The accounts, of course, tell a story and frame the information presented, particularly in the headings, leads, and closings. Numerous interpretive comments are sprinkled through the accounts in the form of quotations from sources or, in the case of television, excerpts from interviews. Cartoons and opinion columns are billed as commentary and are freer of such constraints. They are especially useful since their packages are more explicit and easier to extract.

Television.—All the television coverage centers on the collective action by the Clamshell Alliance at Seabrook and its aftermath. New Hampshire Governor Meldrim Thomson blessed the “Clam” with a major social control error. The 1,414 demonstrators who were arrested were not, as expected, released on their own recognizance. Instead, they were charged with criminal trespass and asked to post bail ranging from \$100 to \$500, which they refused. They were then held in five national guard armories for 12 days, creating a continuing national television story. Each of the networks ran segments on five different days, although sometimes merely a short update.

The television story is about a dyadic conflict between Governor Thomson and his allies and the Clamshell Alliance over whether or not the Seabrook reactor will be completed. The central question in this story

is of who will win, and, hence, there is very little direct commentary about nuclear power. But the coverage does address one central issue that divides packages: What kind of people are against nuclear power?

For a deaf television viewer, the answer would seem to be people who wear backpacks and play frisbee. All three networks feature these images in more than one segment. One sees beards and long hair, bandanas, “no nuke” buttons, and people playing guitars and doing needlepoint. Outside the courthouse, after the demonstrators have been released, we see happy family reunions, with many children.

These visual images do not have a fixed meaning. People approach them with some anticipatory schema. A *progress* sympathizer may see frivolous flower children and environmental extremists who look as if they will not be happy until they turn the White House into a bird sanctuary. A *soft paths* viewer may see loving, caring, earthy people who are socially integrated and concerned about our shared environment. But these two are the *only* packages that really suggest an interpretation of these images, and those who use neither are likely to be especially susceptible to the meanings suggested by the accompanying words.

Here there are network differences. The CBS and NBC coverage leaves the work to the viewer, but ABC offers its own interpretation and it suggests a *progress* package. We are told that these are the same kind of people who were involved in antiwar demonstrations, “demonstrators in search of a cause.” The network allows two members of the Clam to speak for themselves, quoting their determination to win while ignoring their reasons (“We have to stop it at any cost”). Such quotations fit nicely with the dyadic conflict frame, but no package on nuclear power is displayed. No interviews or quotes from the protesters were used by NBC.

Only CBS made any attempt to present the demonstrators’ frame. In introducing its May 2 segment, it reported that the Clamshell Alliance opposed the plant because “they say it is dangerous and a threat to the coastal marine life.” In a later segment, we hear Harvey Wasserman, a spokesman for the group, claim the antinuclear movement as an antiwar movement: “We are fighting the war that is being waged against the environment and our health.” Later, in the same segment, the threat to marine life is mentioned along with safety concerns as reasons for the protest. Beyond these three utterances, three general expressions of determination by demonstrators are quoted, but no other antinuclear packages are suggested.¹⁶

¹⁶ We should note, out of fairness to the networks, that the Media Institute examined “outside sources” quoted in 10 years of coverage before TMI. They found that antinuclear sources received considerably more airtime than pronuclear ones. The Union of Concerned Scientists finished first by a wide margin (with 6:18). Ralph Nader (3:34)

Newsmagazines.—*Time* and *Newsweek* ran stories on Seabrook, again with a dyadic conflict frame and little commentary about nuclear power per se. The demonstrators are presented relatively sympathetically. Both magazines mention their commitment to nonviolence, and *Newsweek* adds their exclusion of drugs, weapons, and fighting. The photographs reinforce the television images of backpackers; *Newsweek* calls them scruffy and mentions frisbee playing, guitar playing, and reading Thoreau. Environmental concerns and the threat to marine life are mentioned but not elaborated. *Time* also quotes the publisher of the *Manchester Union Leader*, William Loeb, who likened the Clam to “Nazi storm troopers under Hitler,” but characterizes him in a discrediting way as an “abrasive conservative.”

A number of antinuclear movement spokespersons are quoted, including Harvey Wasserman, Ralph Nader, and representatives from Friends of the Earth, the Sierra Club, and the National Resources Defense Council. But none of the selected quotes suggest a frame on nuclear power; instead, they focus exclusively on the strategy of direct action and whether the demonstrators will succeed. The *Newsweek* story, in particular, leaves the impression of internal division among movement organizations.

There is a largely implicit *progress* frame, reflected in the full separation of the controversy from concerns about nuclear weapons (a dualism that was largely accepted by the Clam as well) and by statements in both magazines suggesting the necessity and inevitability of nuclear power as an energy source. No antinuclear package is displayed beyond the faint hint of *soft paths* implied by the mention of safety and environmental concerns.

Cartoons.—None of the seven cartoons comment on Seabrook as such. Three focus on Carter’s efforts to control the spread of nuclear technology, two on the failure of some nuclear plants to account for all of their plutonium and enriched uranium,¹⁷ one on the administration’s energy plans in general, and one on the safety issue. There is no *progress* in this set, but they do not all suggest an antinuclear package. Four of the seven

edged out the Atomic Industrial Forum (3:26) for second place. This finding should be tempered by two observations: (1) official sources, such as the Nuclear Regulatory Commission, who are not included in this analysis, often present a pronuclear package, and (2) critics may be quoted without their packages on nuclear power being displayed, as the Seabrook coverage demonstrates.

¹⁷ Publicity over the mysterious 1974 death of Karen Silkwood had brought to light that the Kerr-McGee fuel processing plant in Oklahoma where she worked was unable to account for 40 pounds of plutonium.

suggest a new package, *runaway*, whose position on nuclear power is fatalistic or resigned more than opposed:

We did not understand what we were getting into with nuclear power. We thought we could harness it to maintain our standard of living. Now we are committed to it and will sooner or later have to pay a price of unknown dimension. We have unleashed it but we no longer can control it. Nuclear power is a powerful genie that we have summoned and are now unable to force back into its bottle; a Frankenstein's monster that might turn on its creator. Nuclear power is a time bomb, waiting to explode. Nuclear energy is not simply one among several alternative energy sources but something more elemental. It defies a cost-benefit analysis. Radiation is invisible and one may be exposed without knowing it; its harmful effects may not show up right away but may strike suddenly and lethally at some later point. Radiation can create grotesque mutants. In a religious version, humans have dared to play God in tampering with the fundamental forces of nature and the universe. He who sows the wind, reaps the whirlwind.

Runaway has an antinuclear flavor, to be sure, but the gallows humor by which it is frequently expressed suggests resignation and fatalism more than opposition. "Grin and bear it" is more the message than "No nukes." Once the genie is out of the bottle, it is too late. Not surprisingly, *runaway*, unlike all the earlier packages, has no organized sponsor attempting to further its career. But it is strongly implied in four of the seven cartoons.

Two of the seven cartoons express an anticorporate theme suggesting the *public accountability* package. The striking thing about this cartoon set, compared with television and newsmagazine accounts, is the implicit rejection of nuclear dualism in six of the seven. They are about nuclear power and not weapons, but nuclear power plants are themselves a time bomb.

Opinion columns.—The eight columns offer a sharp contrast to the cartoons. Here there is a strong dualism, sometimes quite explicit, although the separation between atoms for peace and atoms for war is no longer as simple as in the 1950s. There is a dilemma, James Reston suggests, over "how to develop nuclear power for peaceful purposes and at the same time restrain its development as an instrument of war." The columns address general energy problems and Carter's efforts to control nuclear proliferation in a context that fully accepts the necessity and inevitability of nuclear power development. The issue is not whether to go ahead with nuclear power but how fast and in what ways. Four of the eight columns also emphasize *energy independence* as a strong secondary theme.

Only one column focuses on the Seabrook action, linking the Clam with the 1960s images of antiwar protestors—scruffy beards, longish hair, and braless women. Some of them "really don't know what they are protesting" writes Jeremiah Murphy, "and—far worse—don't care."

There is only one faint suggestion in the entire set of columns of any antinuclear package or even of the fatalistic *runaway*.¹⁸

This review of media discourse before TMI provides a mixed picture. With the exception of cartoons, there is virtually no display of any anti-nuclear package, but the confident dualism of an earlier era has become uneasy at best. *Progress* is represented in the acceptance of nuclear power development as necessary and inevitable. But the discourse clearly recognizes it as controversial, even if one can gain only a vague awareness of how nuclear opponents think about the issue.

The editorial cartoonists present a very different picture—one in which the themes of *runaway* and *public accountability* are dominant. Perhaps their greater distance from active sponsors and the debunking inherent in their medium makes them more resistant to the official package. In any event, they presage the packages that will come into general prominence only after TMI.

The apogee of antinuclear discourse in the effect on popular consciousness came with the release, a few scant weeks before TMI, of a major Hollywood film, *The China Syndrome*. The film numbered among its stars Jane Fonda, an actress so closely identified with the antinuclear movement that pronuclear groups used her as a symbol of it. The themes emphasized by the film suggest the *public accountability* and *runaway* packages, but its most important achievement was to provide a concrete, vivid image of how a disastrous nuclear accident could happen. Of course, it was just a movie.

3. Life Imitates Art: From TMI to Chernobyl

As events unfold, each package must offer an interpretation that is consistent with its story line. Although it is always possible to do this, the result is sometimes labored, particularly if the event is, from the standpoint of the package, unexpected. Consider how the *progress* package handles TMI and Chernobyl:

TMI showed that the safety systems worked even in the face of a string of improbable errors. A total core meltdown was prevented, and most of the radiation released never breached the containment building. Furthermore, we learned from the experience and have improved safety even more. Chernobyl has equally sanguine lessons. It shows the wisdom of the American nuclear industry in building large fortified containment structures as a safety precaution. Nuclear reactors in the United States have multiple

¹⁸ Richard Strout, in discussing other countries' distrust of Carter's motives in trying to curtail breeder reactors, has them wondering whether the United States is "trying to create a capitalistic monopoly of nuclear fuel for itself." Our coders included this under the *public accountability* category on corporate greed.

protective barriers, called “defense in depth.” American nuclear reactors cannot be compared with their Soviet counterparts any more than their political systems are comparable. Furthermore, even in this most serious of accidents, it turns out that initial claims of thousands killed reflected mere hysteria, egged on by antinuclear activists.

Events, as the Fermi accident illustrates, do not speak for themselves. By 1979, a *progress* interpretation was forced to compete with others that were saying that a serious nuclear accident could and probably would happen. No complicated interpretation is necessary for a prophecy fulfilled.

We sampled the media for two weeks after both TMI and Chernobyl.¹⁹ Our TMI sample yielded 53 television segments, 6 newsmagazine accounts, 71 cartoons, and 56 opinion columns. The accounts, as we noted above, are less explicit in their framing of nuclear power as such. Their stories on TMI center on two central questions: (1) What is it like to be living next to TMI? Since there are many other reactors, there is a more general question implied here: What is it like to be living near a nuclear reactor that has had an accident? (2) Is the situation at TMI under control? Again, there is a more general story, especially as the immediate TMI crisis subsides: Is this technology under control?

Television.—The situation at TMI was a continuing story that dominated the coverage of all three networks during the sample period. Visually, we were treated to repeated aerial shots of the reactor site, making the special shape of a nuclear cooling tower a familiar visual symbol for the first time. The use of this icon by cartoonists began with TMI, where it frequently took on an ominous tone.

Nimmo and Combs (1985) suggest that ABC in particular used the cooling towers as visual reinforcement for a *runaway* package that permeated its coverage and provided its central story line: “In the gothic romance, the threat to peace, tranquility, and happiness is embodied in a forbidding structure overlooking the community of simple folk. . . . Dr. Frankenstein’s castle in Transylvania, in a bucolic countryside above a quaint village, is the classic setting.” They argue that ABC’s footage and camera angles played on such imagery, “especially on days when ABC correspondents did stand-up reports with the plant’s massive cooling towers, enveloped in mist, looming in the background. . . . Aerial shots, too, captured a technological intruder in a rural setting” (pp. 69–70).

There is rare use of the mushroom cloud symbol. The Media Institute study (1979) found only four instances of its use in the more than 10-year period it covered—including the TMI period in our sample. We found it

¹⁹ The Chernobyl samples include only television and newsmagazine accounts. The assembly of cartoons and opinion columns involves a much more complicated data-gathering process—beyond our resources at that stage of the research.

only twice in our sample, but, in addition, two of the three networks ran an Atomic Energy Commission film of bomb tests in the late 1950s in Nevada.²⁰ The film shows houses being obliterated in an awesome blast, followed by the familiar rising mushroom cloud. Direct images of nuclear destruction are rare, but high frequency may be unnecessary for effect if the association is already present in the schemata of many viewers and the images are sufficiently vivid and evocative.

Seven years later, with the accident at Chernobyl, nuclear power again dominated the television evening news. All three networks ran nightly stories for the entire period of our two-week sample. Visually, there were many repeats of imagery from TMI coverage but with several new additions. The most striking new image involved frequent footage of radiation detectors being used to check people and food. There were 15 different instances of such visual reminders of the invisible danger theme, well distributed among the three networks. In addition, all three showed American or European antinuclear protestors, with a total of eight such instances. The protestors' signs reminded viewers that "Chernobyl can happen here" or "Chernobyl is everywhere." Radiation, in television graphics, is almost invariably red—often in the form of a pulsating red dot to show an untamed reactor or a spreading red streak to represent the flow of fallout. Of the 12 occasions on which such graphics were employed, only once was another color used (in this case, white).

For both events, there is much visual filler of little interest for the framing of nuclear power. There are many talking heads, didactic summaries of points being made by announcers and interviewees, and graphics to illustrate a technical discourse on nuclear reactors.

On the audio, two themes in particular dominate the accounts: official confusion and the scary, invisible effects of nuclear radiation. As they are developed, these themes give a powerful boost to the *runaway* and *public accountability* packages. There were, in this coverage, 99 utterances that expressed idea elements central to a package on nuclear power. Figure 1 shows the distribution among the set of six.

The once dominant *progress* has shrunk to a mere 18% and frequently has a grudging and defensive tone. For example, NBC quotes Secretary of Energy James Schlesinger conceding that TMI was an "unfortunate occurrence and the reaction to it will not be beneficial, save that it may permit us to better understand some of the plant operations and that the NRC will be able to institute measures that will reduce risks."²¹

²⁰ This film was pegged to coverage of congressional hearings on charges that the U.S. government had lied to local residents in Nevada about the dangers of radioactive fallout from its atomic tests.

²¹ NBC News, March 30, 1979.

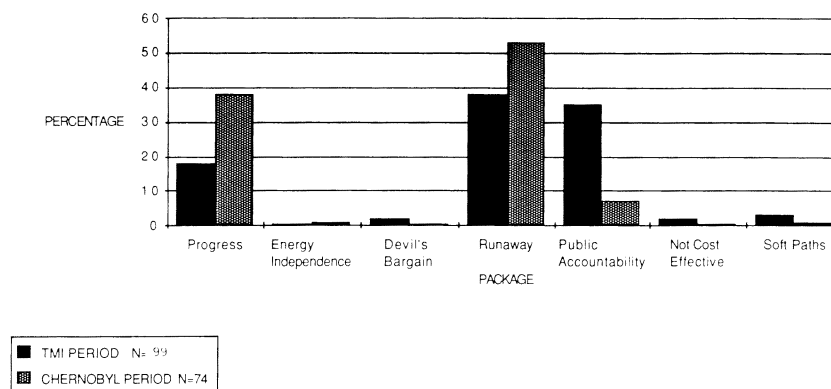


FIG. 1.—Nuclear power packages in television utterances

Nimmo and Combs (1985) suggest that *progress* may still be prominent at a more aggregate level, but only in CBS's coverage. Its formula, repeated in each nightly update, is a warning of danger and an explanation that shows the nature of the problem and of officials managing it. "Experts," "scientists," "officials," or "technicians" are shown to be dealing with the danger and its consequences as best they can in a difficult situation. The general story line of CBS, Nimmo and Combs suggest, is "an adventure tale in the tradition of 'disaster averted' movies. . . . In such dramas, responsible people take concerted action to bring an unfortunate situation under control" (p. 68).

The two most prominent packages are clearly *runaway* and *public accountability*, with 38% and 35%, respectively. The former is displayed primarily through two central ideas, which together account for almost three-fourths of its total: (a) the overconfidence theme: officials in charge of nuclear energy may think they have it under control but they really do not, and (b) the hidden danger theme: radiation effects are invisible and delayed, so that one may not know the true harm done until many years later.

The interpretation of official confusion is less benign in the *public accountability* package. The emphasis here is less on self-deception and more on deliberate misleading of the public by the nuclear industry. We distinguish here a weak and a strong form of the package. The strong version, which includes about 30% of its total, suggests that profits are emphasized at the expense of public safety, that government regulation is ineffective because public officials function as promoters of the industry, or that industry interests work against providing full protection and information to the public. The weak version suggests merely some culpability by company managers, with negative consequences for the public or

consumers. No analysis of reasons for such culpability is suggested beyond general incompetence, stupidity, laxness, or overconcern with public image.

The almost total absence of *energy independence*, *not cost effective*, and *soft paths* is quite striking. All these packages, although differing in their conclusions, frame nuclear power in terms of a broader energy issue, comparing it with alternative sources. Implicitly, television coverage emphasizes the uniqueness of this source and those features that make comparison difficult or impossible.

The coverage of TMI saw the emergence of a new frame for understanding nuclear power, characterizing it as a Faustian *devil's bargain*:

So nuclear power turns out to be a bargain with the devil. There are clear benefits such as inexhaustible electricity and an energy supply that does not depend on the whims of OPEC. But sooner or later, there will be a terrible price to pay. We are damned if we do and damned if we don't. And the deeper we get in, the harder it is to get out.

Devil's bargain is a package that conflates pronuclear packages with *runaway*. It is a thoroughly ambivalent package—both for and against nuclear power. Figure 1, which uses utterances as a unit, does not do justice to the prominence of this package because it is more frequently expressed by combinations of utterances in the same rhetorical sequence. When pronuclear claims and *runaway* elements occur sequentially, for example, one might argue that it has been implicitly invoked. This sequence in fact occurred in five of the 18 television segments with three or more codable utterances, and the frame was made explicit in a sixth segment.

The Chernobyl coverage produced an additional 74 utterances implying a core frame on nuclear power. As figure 1 indicates, there is an apparent comeback for *progress*, which rebounds to 38%. Almost two-thirds of these *progress* utterances, though, are represented by the claim that American reactors have safety features—such as reinforced containment structures—that were lacking in the Chernobyl reactor, making a similar accident unlikely or impossible. Another 14% of them consist of claims, mostly emanating from Soviet sources, that the American media were exaggerating the seriousness of the Chernobyl accident. Only once is *progress* expressed in a clearly positive way through an assertion of the benefits of nuclear power.

Runaway remains the leading package, with many images of what Dan Rather called the “nuclear nightmare of a reactor gone wild.” It is represented in claims that, in spite of some differences in reactor technology, a Chernobyl could occur here, and in images of a spreading “silent killer”—an invisible cloud of radioactive fallout. *Public accountability* is dis-

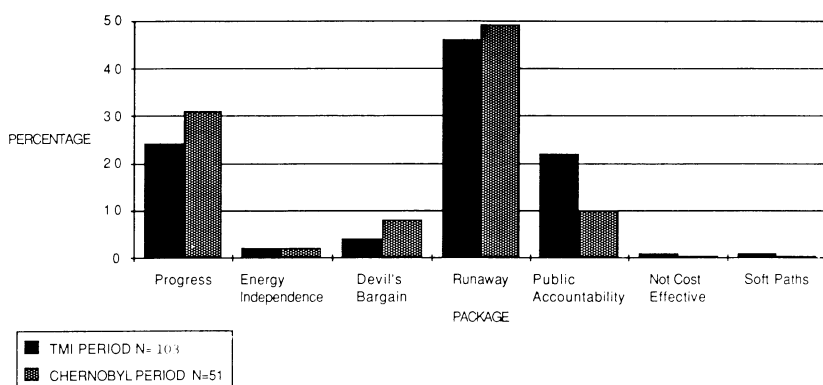


FIG. 2.—Nuclear power packages in newsmagazine utterances

played mainly by invoking comparison with earlier official dissembling in the United States at the time of Three Mile Island. The *devil's bargain* frame is never made explicit, but the sequence of a claimed benefit for nuclear power juxtaposed with *runaway* imagery occurs in two of the nine segments with three or more codable utterances.

Newsmagazines.—The pattern here is quite similar. Figure 2 shows the distribution of 103 utterances displaying central ideas in one or more of our six packages. *Progress* does somewhat better in quantity, but, as with television, it is a beleaguered faith that is expressed. *Time*, for example, quotes Alvin Weinberg, introducing him as a nuclear advocate and pro-nuclear author who believes that the alternatives to this source are “so crummy that we probably should in a cautious way continue this nuclear enterprise.”²² This is still *progress*, but it has evolved quite a bit from “too cheap to meter.”

Runaway is by far the most prominent package, but some caution is necessary in interpreting this. More than two-thirds of the utterances that evoke it focus on the overconfidence theme that the developers of nuclear power have overestimated their control and do not know as much about what they are doing as they have led us to believe.

Public accountability drops off in quantity from its television prominence, but when it is displayed, the strong form of it is presented more fully, accounting for almost half the coded utterances (compared with one-third of television displays of this package). *Newsweek*, for example, quotes Jane Fonda: “We can never be safe in the hands of utility executives whose financial interests require them to hide the truth from the public.”

²² *Time*, April 9, 1979, p. 20.

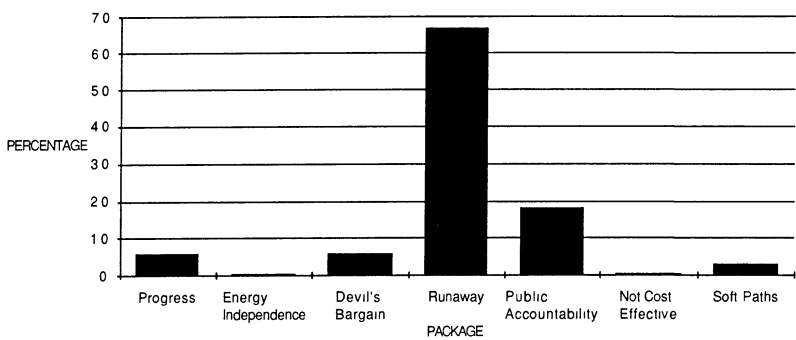


FIG. 3.—Nuclear power packages in cartoons, TMI period ($N = 67$)

The prominence of *devil's bargain* is, again, underrated by using utterances as a unit. Both *Time* and *Newsweek* make it explicit twice, and all three display it implicitly by juxtaposing claimed benefits of nuclear power with *runaway* themes. The remaining packages have very low prominence in newsmagazine discourse.

Figure 2 also shows the package scores for coverage of Chernobyl. *Runaway* leads with almost half of the codable utterances, and, again, *progress* is displayed defensively, mainly by comparisons of the safety of Soviet and American nuclear power plants that malign the former. *Devil's bargain* is again expressed both implicitly and explicitly in two of the three magazine accounts.

Cartoons.—While *runaway* fares well in accounts, it receives its fullest expression in cartoons, where it dominates the discourse. As figure 3 indicates, more than two-thirds of the cartoons express it in one way or another. There are two ideas in particular that account for almost half of the *runaway* cartoons.

The first is well illustrated by the Don Wright cartoon (fig. 4). The joke is on those who think they have this technology under control. The audience can see that they do not, but the “nucleocrats” are themselves unaware and foolishly overconfident. The second idea is expressed through gallows humor about nasty nuclear surprises, as in the Larry Wright cartoon (fig. 5). We suggest that such humor expresses the fatalism that is at the core of this package—the acceptance of nuclear power as an inevitable, uncontrollable fact of life combined with anxiety about the unknowable disasters that may spring from it. Gallows humor, as Hodge and Mansfield suggest (1985, p. 210), is a way of “distancing the unthinkable so that it can be turned on its head, and subjected to a sense of control.”²³

²³ A caveat about these results is in order. We made two important coding decisions

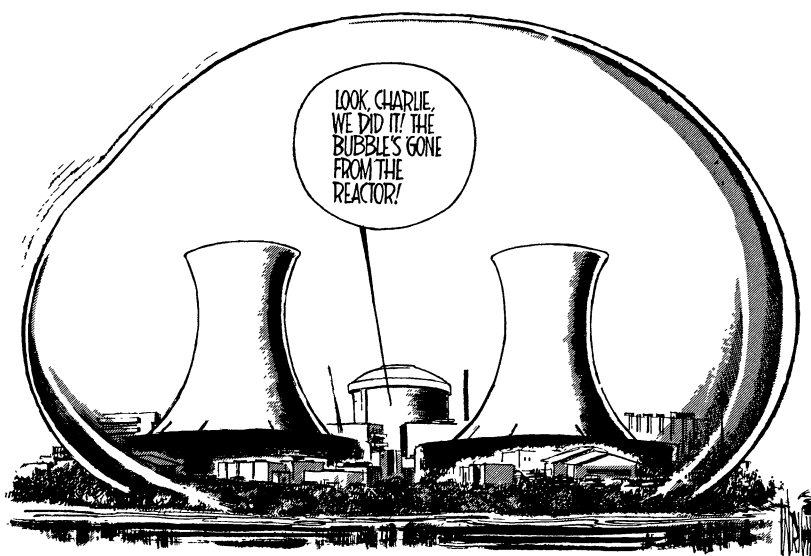


FIG. 4.—Cartoon by Don Wright (*Boston Herald American*, April 6, 1979)



FIG. 5.—Cartoon by Larry Wright (*Detroit News*, April 8, 1979)

Progress appears only four times (6%) and always in the same form—through mocking the overreaction of antinuclear hysterics. Figure 6 expresses the idea most clearly, suggesting that people who oppose nuclear energy are like those who would have opposed the invention of the ox cart in prehistoric times.

Opinion columns.—Figure 7 shows the percentage of columns in which

that may have led to underestimating the *public accountability* package. There were six cartoons playing on the coincidence of *The China Syndrome* and TMI. Where there was no explicit emphasis on corporate culpability, we have treated these as *runaway*. There were also five cartoons depicting overconfident nuclear officials but with the deliberateness of their deception left ambiguous. Again, we ended up including these as part of *runaway* rather than *public accountability*.



FIG. 6.—Cartoon by Jeff MacNelly (*Chicago Tribune*, April 10, 1979). (Reprinted by permission of the Tribune Company Syndicates, Inc.)

each package was displayed.²⁴ A fuller range of packages is displayed in this discourse than in the other media samples—every package registers at least 10%. Furthermore, packages are more richly elaborated in this sample, not merely suggested by a passing comment or brief quote.

Progress does slightly better here than in the other samples but also encounters a good deal of mockery as its rivals are presented. Art Buchwald, for example, bemoans the selfishness of many Americans living near nuclear plants, who are unwilling to make sacrifices so that other people, hundreds of miles away, can be assured that “their toasters and electric coffee makers will work. . . . Unfortunately, they can’t appreciate that with any form of electricity there is a tradeoff, and it’s impossible to have cheap nuclear power without a few noxious gases, an occasional hydrogen bubble, a meltdown and possibly an explosion which could make one or two states uninhabitable for 50 or a hundred years.” Buchwald assures us that his own views on nuclear power depend on which way the wind is blowing. When it is away from Washington, D.C., he is pronuke, but on mornings when the wind is blowing from TMI, he tells his wife, “I think Jane Fonda is right.”²⁵

²⁴ Columnists frequently display more than one package to balance or evaluate arguments pro and con. Hence, the percentages in fig. 4 add up to more than 100%.

²⁵ Buchwald’s column, “As the Wind Blows,” appeared in newspapers on April 10, 1979.

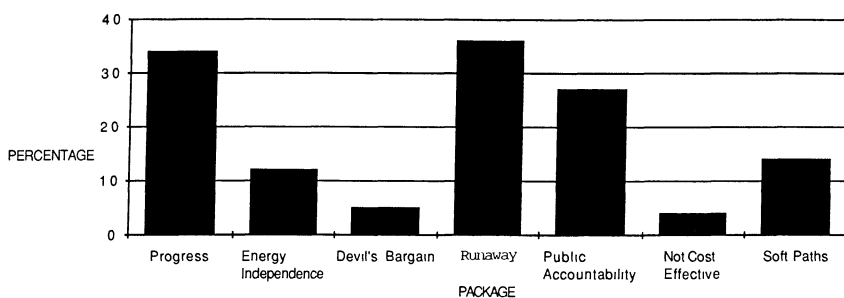


FIG. 7.—Nuclear power packages in opinion columns, TMI period ($N = 56$). Percentages total more than 100% because some columns display more than one package.

The *soft paths* package is more frequently and fully displayed in this sample than anywhere else, appearing in a positive way in one-seventh of the columns. It generally takes the form of advocating a major effort at conservation and the development of soft-path energy alternatives, sometimes combined with belittling comments on American addiction to energy-consuming gadgetry.

Overall.—The picture that emerges is a newly dominant *runaway* package. The pronuclear *progress* is still a prominent contender, but it is beleaguered and defensive, a far cry from the 1950s version. Most important for understanding public opinion, the dominant package in media discourse is fatalistic. When its impressive totals are combined with the thoroughly ambivalent *devil's bargain*, it is clear that any overall characterization of media discourse as pro- or anti-nuclear-power necessarily obscures this central fact.

SURVEY DATA ON NUCLEAR POWER

Questions have been asked about nuclear power on sample surveys for many years, and there are a number of useful reviews of this material.²⁶ We select here certain results that, we argue, can be fully understood only in the context of media discourse on the issue.

1. Questions have been asked concerning nuclear power in general as well as about a plant's being built nearby. As one would expect, there are consistently higher levels of opposition to building a nuclear power plant near one's own community than to nuclear power development in general. This discrepancy suggests the *nimby* position on nuclear power: "OK, but not in my backyard." Substantial change in the percentage

²⁶ See esp. Mazur (1988); Nealey, Melber, and Rankin (1983); Mitchell (1980); and Freudenberg and Baxter (1983).

saying they support or oppose local plants results from slight changes in question wording, making it difficult to estimate the exact size of this group, but it appears to be at least 15% and is probably much higher.

2. On the question of opposition to a local plant, a substantial shift occurred even *before* the accident at TMI. In 1971, only 25% were opposed to the building of a nuclear plant in their communities.²⁷ By 1978, before TMI, opposition to local nuclear facilities had jumped to 45% and actually exceeded support for the first time. By 1980, opposition had grown to 63% while support for a local plant had dropped to only 25% (compared with 57% in 1971). Finally, a 1986 Gallup poll conducted for *Newsweek* in the aftermath of Chernobyl shows opposition to a local plant reaching 70%.²⁸ The trend toward increasing opposition before the TMI accident is less clear when people were asked about supporting nuclear power development in general.

3. At first blush, one might think that TMI was a watershed event that destroyed public confidence in nuclear power. From February 1979, just before Three Mile Island, to April 1979, just after TMI, opposition to nuclear power rose by 14% while support fell by 11%. Mazur's (1981) analysis, however, shows a rapid recovery to previous levels of support. Yes, there was a sharp temporary increase in opposition to nuclear power with the flood of publicity about the TMI accident, but when the media spotlight was turned off, public opinion rebounded almost immediately to pre-TMI levels. Even more impressive, the same rebounding effect was replicated at the release of the Kemeny Commission report on the accident six months later. Again, there was a sharp increase in media coverage, accompanied by a sharp drop in support for nuclear power. And, again, there was the same rebound to previous levels once the media spotlight was turned off.

The rebound, however, is never quite complete. When public opinion is viewed over a 15-year period beginning in the early 1970s, TMI looks like little more than a small blip, which slightly accelerated a secular trend against nuclear power.

4. There is a striking reversal in the relationship of age to support for nuclear power. Back in 1950, Fisher et al. (1951, p. 76) found that "youn-

²⁷ Twenty years earlier, Fisher, Metzner, and Darsky (1951) asked people about "the establishment of an atomic plant near their residence" and got the identical result of 25% opposed. The authors of this early study show unusual prescience, noting that favorable attitudes toward nuclear power rest on a thin faith: "If there were any sort of evidence that not even the experts quite understand or could control this tremendous source of energy, . . . attitudes might sharply incline to the negative. . . . In all likelihood, it would take but one highly dramatic and well publicized event . . . to upset the faith" (p. 102).

²⁸ *Newsweek*, May 12, 1986, p. 30.

ger respondents are definitely more positive in their acceptance of atomic energy and this positive reaction decreases with age." By the 1970s, this result had been largely reversed. In surveys taken between 1975 and 1980, general opposition to nuclear power averaged 40% in the 18–25 age group, dropping to 37% for the 26–35 group and to about 30% for those over 36.²⁹

5. One final result worth noting is that those who have reviewed multiple surveys have noted the sensitivity of responses to small differences in question wording and the context of the question in the interview (Freudenberg and Baxter 1983; Nealey et al. 1983; Mitchell 1980). It is not clear whether this volatility is really higher than on other issues, but it struck these observers as significant when they attempted to distill the results of many different surveys.

Interpretation

How does our analysis of media discourse provide a necessary context for understanding these survey results? Imagine a member of the public, old enough to remember Hiroshima and the age of nuclear dualism, trying to make sense of the issue of nuclear power. Let us assume, further, that the issue has only moderate to low salience for our hypothetical citizen except on those occasions when it is given high priority in the media.

Back in the 1950s, she would almost certainly have used a *progress* schema³⁰ to understand nuclear power; no other frame was available. Until the mid-1970s, she would have had little reason to think about the issue at all. We can reasonably assume that, when she encountered media discourse, her anticipatory schema remained *progress*.

At this point, her personal exposure to the issue culture through either the media or other discourses, her enduring predispositions, and her interpersonal interactions would all have played a role in the modification of her working schema on nuclear power. Many paths were possible, but the nature of the media discourse suggests that certain ones were especially likely.

In the mid-1970s, the discourse overwhelmingly accepted the inevitability and societal commitment to nuclear power development, but there was, at the same time, a significant erosion of nuclear dualism combined

²⁹ Surveys going back to the 1950s show a large and consistent gender gap, with women much more opposed to nuclear power. The explanation for this almost certainly lies outside media discourse. Nelkin (1981) has a particularly insightful treatment of the issues.

³⁰ Schema and package are parallel concepts. We use "schema" when referring to the level of individual cognition and package when referring to the cultural or discourse level.

with public controversy about the safety of nuclear reactors. In cartoon discourse, in particular, *progress* was supplanted by *runaway* and *public accountability*, a harbinger of their general prominence after TMI.

We would hypothesize that many older people during this period began to conflate their pronuclear *progress* schema with *runaway* themes to produce some version of the ambivalent *devil's bargain*.³¹ Clear antinuclear packages are rarely encountered in the national media we sampled during this period. Without some independent exposure to other forums of discourse, it is difficult to see how someone would arrive at one of our antinuclear schemata.

The media discourse stimulated by TMI, we hypothesize, accelerated a shift from *progress* to *runaway* and *devil's bargain* as the most popular schemata among the attentive public. Displays of the old faith, when they occurred, emphasized the necessity and inevitability of nuclear power—idea elements that can be incorporated into these alternatives. At the same time, the theme of a technology out of control, defying its alleged masters, was repeated again and again. Images of false confidence and apparent deception by the nuclear managers abounded. Gallows humor about mutants, hidden radiation, and nuclear catastrophes dominated the cartoon sample, and the same themes came up more soberly in opinion columns as well.

Members of the public who paid attention only after TMI should have encountered this stream of media discourse in a different way. Not having participated in the issue culture when *progress* dominated, they should have been more likely to adopt an unambivalent antinuclear schema. Hence, we would expect less outright opposition and more ambivalence among people who became politically conscious before the 1970s.

After TMI, we suspect that the majority of those who appear to support nuclear power were, in fact, ambivalent. The behavioral psychologist's approach-avoidance conflict is the prototype. When food is associated with a severe electric shock, the rat is both attracted and repelled by the same object. In the case of nuclear power, it is not merely a matter of recognizing arguments on both sides but of experiencing simultaneous tendencies to approach and avoid it.

Some proportion of those who were already ambivalent at the time of TMI would have shifted to an antinuclear schema, particularly *not cost effective* or *public accountability*. *Soft paths* was rarely displayed in

³¹ We are talking here about those members of the public who had some minimal awareness of the issue. For many people (perhaps a majority) before TMI, nuclear power had insufficient salience for them to make any effort to make sense of it. And even since Chernobyl, when the size of this inattentive group has undoubtedly become smaller, one should not assume that everyone has a working schema on nuclear power.

media discourse except in the attenuated form of general environmental and conservation concerns and interest in the solar energy alternative. A person would have had to move beyond national media discourse to encounter this package in a fully developed form.

Media discourse after Chernobyl reinforced both tendencies: from pro-nuclear *progress* to the fatalism of *runaway* or the ambivalence of *devil's bargain*, and from ambivalence to outright opposition. Today, we suspect, a pure *progress* schema is rare among the public; the significant division that remains is between those who continue to accept the necessity or inevitability of nuclear power, inherent in the *devil's bargain* and *runaway* packages, and those who unambivalently oppose it, weaving fragments of the available discourse into some overall antinuclear schema.

These speculations about public thinking on nuclear power are very difficult to test directly with existing survey data. Consider the dilemma that a typical survey question on nuclear power presents to respondents with a *devil's bargain* schema: "In general, do you favor or oppose the building of more nuclear plants in the United States?" How does one respond if one believes that nuclear power is a necessary fact of life but that sooner or later there will be an enormous price to pay? Does one answer favor, oppose, or not sure? Any of these alternatives is consistent with a *devil's bargain* schema.

Nevertheless, the survey results cited above provide indirect evidence for the argument. For someone with a *devil's bargain* schema, general support combined with local opposition provides a neat solution to the dilemma of what to do about nuclear power: the *nimby* position. If the nuclear plant is not too close, the avoidance valence is less pronounced and nuclear power becomes a more attractive object.

We do not argue that people will come to the *nimby* position through seeing it advocated in media discourse and adopting it. On the contrary, one would be hard put to find it, since it is not openly espoused by any spokesperson for the government, nuclear industry, or antinuclear movement. But media discourse increasingly supports the conflated *devil's bargain* package, both directly and by offering *runaway* on top of decades of uncontested *progress*.

Widespread ambivalence can also account for the temporary decline in apparent support for nuclear power during moments of peak media coverage, followed by a partial rebound to former levels when the media attention subsides. When the media discourse gives the dangers a temporary imminence, the force of the avoidance vector increases and ambivalence is temporarily resolved as opposition. When media attention turns elsewhere, the balance of forces is restored for those who retain an ambivalent schema.

The evidence for change in how age influences opposition to nuclear power adds further support to our argument. In an earlier era, young people were least opposed to nuclear power because they were especially susceptible to the appeal of the *progress* package. Today, having become middle-aged, they retain the long-term influence of this discourse and are more likely to be ambivalent than opposed. Young people today, never having experienced the era in which *progress* reigned unchallenged, are more likely to be opposed rather than ambivalent.

Our model also suggests an interpretation of why there should be so much volatility of response with slight changes in question wordings. The questions are difficult, if not impossible, for an ambivalent respondent to answer. Of course, such volatility may simply mean the absence of *any* stable schema rather than a stable and conflicting one. But it is, at a minimum, consistent with ambivalence.

Finally, there is some more direct evidence on widespread ambivalence in two surveys reviewed by Nealey et al. (1983). In one, conducted in October 1979, respondents were asked independently about both “benefits” and “harmful consequences” from building more nuclear power plants. If we count the 37% who could think of no benefits as antinuclear and the 22% who could think of no harmful consequences as pronuclear, this gives us an estimate of 41%.³²

Another survey in July 1979 yielded a similar estimate. All respondents, regardless of attitude, were asked what they saw as the major advantages and disadvantages of nuclear power. This form yielded a slightly higher antinuclear percentage, with 42% unable to name any advantage and only 14% unable to name any disadvantage. This leaves a balance of 44% who were ambivalent.

CONCLUSION

We have argued here that public opinion about nuclear power can be understood only by rooting it in an issue culture that is reflected and shaped by general audience media. The conventional method of assessing public opinion through responses to survey questions with fixed categories has two major drawbacks for our constructionist model, making it difficult to test our argument directly. First, it obscures ambivalence and disguises the presence of schemata that produce no clear-cut position for or against. Second, it blurs the distinction between people with nonat-

³² This question was asked only of the 91% who had “ever heard or read about controversies over nuclear power plants.” Ambivalence, as we indicated above, is more than simply knowing arguments on both sides. Hence, such figures should be regarded as crude estimates of upper limits on the number of those who are ambivalent.

titudes—that is, with no working schema on an issue—and those with schemata that do not fit comfortably in a pro or anti category.

One of the major lessons of the 1964 Converse article “The Nature of Belief Systems in Mass Publics” was to warn against the tendency to impose elite dichotomies such as “liberal” and “conservative” on a mass public whose beliefs are not organized by such dimensions. Similarly, the classification of the public into “hawks” and “doves” concerning Vietnam war attitudes made it difficult to identify those whose schema led them to a “win or get out” position. This lesson is ignored so easily, we submit, because of a methodological tradition that assumes the task is to array relevant publics on a pro-con dimension.

By framing issues for people through the question asked and the pre-coded response categories offered, the method assumes a shared frame on nuclear power. But a constructionist model begins by calling this assumption into question and examining it. A proper constructionist methodology for assessing public opinion must do more to make the underlying schemata visible in some fashion, preferably by allowing us a glimpse of the thinking process involved.³³ Only by methods that elicit more of the interpretive process will we be able to see the extent to which different media packages have become part of the public’s tool kit in making sense of the world of public affairs.

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³³ Our personal choice is for a methodology that we call “peer group conversations.” We construct a group by sampling individuals and bringing the contact person together with three or four friends for a discussion of nuclear power and other issues. From analyzing such conversations, we hope to be able to address issues that surveys on nuclear power attitudes leave unresolved—issues concerning which media packages are used in what ways and how people negotiate meaning on the issue.

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