Not All Events Are Attended Equally: Toward a Middle-Range Theory of Industry Attention to External Events

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Abstract

This paper builds on prior theory and research on attention and identity to examine whether and how industries publicly attend to external events. Events are critical triggers of institutional transformation and industry evolution. However, they must first become the focus of public attention to have this effect. We draw on a paired case comparison of media coverage of eight nonroutine events affecting the natural environment and the U.S. chemical industry. We employ both deductive and inductive analysis to develop a model and hypotheses to explain two research questions. First, what determines the initial public attention to an event? Second, when and why do certain events attain high and sustained levels of industry attention? A key inference is that whether an event receives industry-level attention depends on either outsiders holding the industry accountable for the event, or insiders' internal concerns with the industry image. We further infer that an event can be transformed into a critical issue for an industry, warranting sustained attention, if there is contestation with outsiders over the accountability for the event and its enactment, and internal contradictions and challenges to the industry's identity.

(*Events*; *Attention*; *Identity*; *Institutions*; *Accountability*; *Environmental Protection*)

Introduction

Highly publicized events are critical triggers of institutional transformation (Fligstein 1990, Sewell 1995, Hoffman 1999). Such public occurrences, here called *critical events,* are contextually dramatic happenings that focus sustained public attention and invite the collective definition or redefinition of social problems (Pride 1995). Variously referred to as shocks (Fligstein 1991), jolts (Meyer 1982), or discontinuities (Lorange et al. 1986), critical events have played a central role in fostering institutional change and industry evolution (Miles 1982, Leblebici et al. 1991).

The publication of *Silent Spring* (Carson 1962) provides an example. *Silent Spring* triggered, within weeks of its release, a political and cultural struggle between the chemical industry, scientific academies, conservation groups, and various government agencies on the industry's accountability for the ecological dangers of synthetic chemical production. The book's author, marine biologist Rachel Carson, argued that chemical manufacturers, by barraging the environment with the synthetic pesticide dichlorodiphenyltrichlorethane or DDT, were poisoning the entire food chain and ultimately ourselves. For the U.S. chemical industry, this book release was no small affair. What was at first viewed as a possibly irritating *event* quickly enveloped into an *issue* of critical proportions. It became a threat to the image and identity (Dutton and Dukerich 1991) of the entire chemical industry and a challenge to the technological preeminence of synthetic chemical production (Florman 1976, Pillar 1991). This challenge triggered unprecedented *public attention* (Hilgartner and Bosk, 1988) from industry associations and individual companies. Ultimately, *Silent Spring* facilitated changes governing chemical industry action, clearing the way for increased government controls on pesticide application.

Past organizational research on critical events has focused on the processes of sense-making (Isabella 1990, Thomas et al. 1993, Gioia and Thomas 1996) and the construction of accounts (Elsbach 1994). But despite the

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centrality of public attention to events in triggering institutional change, very little work in organizational studies has addressed why some events become the critical focus of attention while other events remain mostly unnoticed (Hoffman 1999). Not all events are attended equally. For example, why did *Silent Spring* receive substantial media attention in the trade journal *Chemical Week* while another major environmental book, *The Limits to Growth,* received limited coverage? The former event led to significant institutional change in environmental policies and practices for the chemical industry. The latter faded in public attention. Why?

Existing theory on public attention (Hilgartner and Bosk 1988) focuses on competition for attention among broad social problems such as water pollution, the energy crisis, and the homeless, but does not explain the level of attention to specific events or why some events become critical problems while others do not. To address this gap in the literature, we undertake an analytical case comparison of public attention to eight environmental events by the U.S. chemical industry. We selected events relating to the natural environment for our study because they provide substantial variation in the level of public attention they have received by industry (Hoffman 1997, 1999). This variation allows for an exploration of the determinants of public attention and inattention that avoids sampling on the dependent variable (King et al. 1994). Building on methodologies of comparative studies of events (Skocpol and Somers 1980, Hicks 1994, Mahoney 1999), our objective is to construct a middle-range theory (Merton 1957, Eisenhardt and Bourgeois 1988) of industry-level attention to external events.

In the following sections we first discuss the general theoretical framework on industry-level attention that guided our research study. Second, we discuss our data and methods used in the selection and analysis of the eight external events. We then present our cross-case analysis, out of which emerge our middle-range theory and explanatory hypotheses. Finally, we present the conclusions of our study and guides for further research.

Theoretical Presuppositions and Research Questions

We began our comparative analysis of cases with a set of orienting theoretical assumptions derived from attention-based theories of organizational action (March and Olsen 1976, Weick 1979, Dutton 1997, Ocasio 1997). These theories view the environment as a source of constant input and stimulus for the organization, but posit that individuals and organizations have limited cognitive capabilities to deal with all available stimuli (Simon 1947, March and Simon 1958). At the level of individuals, *attention* encompasses the noticing and focusing of time and effort on both the environmental stimuli requiring action and the available repertoire of responses which define that action (Ocasio 1997).

In this paper we focus on attention at the level of the industry. We introduce the concept of *industry-level attention,* which highlights how industry participants, in their communications and interactions with other industry participants, selectively focus their attention on a limited set of issues, situations, and activities that represent potential problems or opportunities for the industry. In particular we focus on industry attention to events external to the industry. In defining *industry participants,* we employ a field-level perspective (DiMaggio and Powell 1983) and include not only representatives from the producer organizations in the industry, but also those from industry associations, trade journals, and other members of the industry's field. While ultimately thinking and attending are activities of individuals, cultural and social processes at the level of an industry shape whether, when, where, why, and how decision makers attend to issues and events (Douglas 1986).

A critical principle of attention-based theories is the principle of *selective attention* (Simon 1947, Fiske and Taylor 1991, Ocasio 2001). This principle suggests that individuals, organizations, and industries will selectively attend to some external events while ignoring others. Attention-based perspectives further posit that selective attention is driven not by the objective characteristics of the situation or event, but by its *enactment* in the environment (Weick 1979, Ocasio 2001). According to Weick (1979, p. 164), "enactment emphasize(s) that managers construct, rearrange, single out, and demolish many of the objective features of their surroundings." Enactment actively orders the environment through the imposition of schemas and causal maps on the objects of action. Selective attention to events is driven by salience (Fiske and Taylor 1991) and salience is shaped by how individuals, organizations, and industries enact events in the external environment.

A second principle of attention-based perspectives is that of *situated cognition* (Suchman 1987, Ross and Nisbett 1991, Ocasio 1997). This principle posits that the attention of industry participants to particular issues and answers is situated within the particular channels of communication through which they interact. In this paper, for example, we focus on the internal channels of the chemical industry through the trade press as compared to the external channels of the broader field through the general news media. For both, we draw upon the concept of *public attention* (Hilgartner and Bosk 1988, Fine 1997, Rao

et al. 1999). Hilgartner and Bosk (1988) treat public attention as a scarce resource for which potential issues compete for time and space. In their framework, competition for attention occurs within *public arenas* or institutionalized channels of communication and social interaction (Ocasio 1997). But, where they look only at external attention to issues, we also consider attention by insiders and the linkage between them both. Relevant arenas may include the press, professional conferences, congressional committees, and academic journals. Each arena possesses limited carrying capacity, so only a few events or issues gain public attention, while most are ignored. According to the principle of situated attention, different public arenas will selectively focus attention on different issues and events in the external environment.

A third principle of attention-based perspectives is that of *the structural determination of attention*. This suggests that how people think and how they attend to an event is a social and cultural process, shaped by the group, organization, industry, and organizational field (Ocasio 1995, 1997). Previous theory (Ocasio 1997) suggests that whether a given issue attracts public attention depends upon whether the claims surrounding it are supported by the following social structures of attention: the rules of the game, status of the players, their social identity and structural position, and the available technology and resources. We draw upon these theoretical categories in our inductive analysis of the determinants of industry-level attention.

We rely on *identity* as a key component of the social structures of attention (March and Olsen 1976, Porac et al. 1989, Dutton and Dukerich 1991, White 1992, Ocasio 1995). We draw upon sociological (Douglas 1986, White 1992) and organizational (Albert and Whetten 1985, Dutton and Dukerich 1991) conceptions of identity. All of these perspectives emphasize the sameness of those who share a common collective identity, and the distinctiveness, real or imagined, between the collective identities of different social groupings. We thereby define *industry identity* as the common rules, values, and systems of meaning by which industry participants establish rules of inclusion, competition, and social comparison among industry members; create distinctions within and between industries; and delimit industry boundaries. Industry identity emerges both from cognitive awareness among industry competitors about the nature of industry rivalry (Porac et al. 1989) and from collective responses to external threats to the collectivity (White 1992). Industry identity embodies meaning and sense-making (Fiol et al. 1998) focused on answering the following questions for its members: Who are we? What are we? What do we do that makes us distinctive as an industry? While industry identity, like organizational identity (Whetten and Godfrey 1988), is often subject to contestation and change, it is an important influence upon actors' collective behavior. For example, Florman (1976) and Hoffman (1997) describe the identity of the U.S. petrochemical industry in the 1950s as being embedded in beliefs in technological optimism. The self-perception was that member companies of this industry were improving the quality of life for individual Americans and the strength of the nation as a whole. Companies were proudly mobilizing America by fueling the record number of automobiles being produced and the economy's expanding industrial base, and providing miraculous new materials that were revolutionizing fields such as medicine, food production, and fashion.

Following previous theory and research (Dutton and Dukerich 1991, Dutton et al. 1994), we posit that the industry's collective identity is shaped by its *image*. *Industry image* is defined as the industry's internal perception of how outsiders think about them, their values, and their beliefs (Dutton and Dukerich 1991) as distinct from the *industry reputation,* defined as the status ascribed to the industry by outsiders (Fombrun and Shanley 1990). While image results from internal sense-making (Gioa and Thomas 1996), reputation results from external attributions. In sum, emergent norms of industry interaction, coupled with an examination of industry image and reputation, shape and constitute industry identity.

We use the perspectives on industry attention and identity outlined above as an initial conceptual guide (Miles and Huberman 1994) in our examination of industry attention to external events. Building on this theoretical framework, the following research questions guide our theory development and hypothesis generation:

Research Question 1: *What explains whether and when some events receive public attention within an industry, while others are ignored?* Research Question 1 seeks to explain variation in the levels of public attention and inattention to environmental events. In particular, we focus on how the social structures of attention and identification (March and Olsen 1976, Ocasio 1997) shape industry attention and inattention to specific external events.

Research Question 2: *When and why do certain events attain high and sustained levels of industry attention?* Research Question 2 seeks to distinguish between short-term levels of industry attention and sustained levels of attention. While many events may receive industry attention at the outset, only a small subset of these events receives continued attention and becomes a critical issue to the industry. Here we will explore the relationships between the process by which the event is enacted over

time (Isabella 1990, Dutton and Dukerich 1991, Barr 1998) and the degree of sustained public attention accorded to an event within an industry.

Data and Method

Our approach to developing middle-range theories (Eisenhardt 1989, Eisenhardt and Bourgeois 1988) builds on methods of causal inference used by historical sociologists in comparative studies of events (Skocpol and Somers 1980, Ragin 1987, Quadagno and Knapp 1992, Hicks 1994). This research uses historical comparisons primarily for the purpose of making causal inferences about macrolevel structures and processes (Skocpol and Somers 1980, p. 181). Unlike grounded theory approaches (Glaser and Strauss 1967), which are more purely inductive, our comparative case methodology begins with a set of research questions and categories derived from previous theories on organizational attention and identity to draw specific causal inferences and testable hypotheses (Miles and Huberman 1984).

Empirical Context of the Study

The empirical context for our study deals with the emergence of events related to the natural environment and environmental protection. This is a rich area for research. Over the past thirty-five years, environmentalism has promoted rapid social change and has been propelled by formative, and at times sensational, events (Scheffer 1991, Goetlieb 1993, Hoffman 1997), while other events have received less notice.

Central to this rich social history has been the involvement of the U.S. chemical industry. This industry has been singled out in public opinion polls as the preeminent environmental threat from the 1970s (Erskine 1971) through the 1990s (Cambridge Reports/Research International 1992). The volume of the industry's waste streams exceeds that of the second most polluting industry sector (primary metals) by more than a factor of two (U.S. Environmental Protection Agency 1992). And in general, its role has been prominent in major environmental catastrophes such as Bhopal, Love Canal, and Seveso. Given this centrality in the environmental realm, the chemical industry is a prime candidate for our study.

Sample of Events

We began by developing a set of environment-related events for study between the years 1960 and 1995, an era marked by many as the "modern environmental movement" (Scheffer 1991, Gottlieb 1993). In the spirit of theory building, we sought variance across the events in our sample (King et al. 1994). These were not, however, meant to be representative of all possible types of occurrences. We first identified an event classification scheme presented by Hannigan (1995) which included milestones, catastrophes, and legal/administrative happenings. Next, drawing from a broad set of event candidates developed by Hoffman (1999, p. 371), we selected individual events from each category in complementary pairs for analysis, based on similar characteristics and attributes.

We selected a total of eight events for case comparison. Given the sample size and selection criteria, this sample set may create possible biases if used for drawing inferences. We believe, however, that our sample set and methodology of comparison analysis offers advantages in theory development (Eisenhardt 1989). While it is unlikely that we could develop a sample that represents *all* possible types of environmental events, we feel that there is more explanatory power in choosing a small number of case comparisons as opposed to a more limited review of a larger number of cases. Descriptive differences uncovered through in-depth comparisons of seemingly similar events should reveal characteristic insights to the attentional processes that guide event enactment and interpretation.

We first selected four events that were considered extremely important in the source literature: the publication of *Silent Spring* (1962); the First Earth Day (1970); Love Canal (1978); and the *Exxon Valdez* oil spill (1989). We then selected four comparable events for case comparison: the publication of *The Limits to Growth* (1972); the reenactment of Earth Day on its twentieth anniversary (1990); the Cuyahoga River fire (1969), and the *Burmah Agate* oil spill (1979). These eight cases are listed in their comparison pairs in Table 1 and briefly described here.

(1) *The Cuyahoga River Fire, 1969.* On June 23, 1969, the Cuyahoga River caught fire for twenty-four minutes, causing $50,000 damage to two key railroad trestles in Cleveland, Ohio. The cause was attributed to oily wastes dumped into the river from waterfront industries and the event has been credited by many as a touchstone for the

Table 1 Paired Comparison Event Sample

1. The Cuyahoga River Fire, June 23, 1969, and The Declaration of a Health Hazard at Love Canal, New York, August 2, 1978.
2. The *Burmah Agate* Oil Spill, November 1, 1979, and The *Exxon Valdez* Oil Spill, March 24, 1989.
3. The First Earth Day, April 22, 1970, and Earth Day, April 22, 1990.
4. The Publication of *Silent Spring*, September 27, 1962, and The Publication of *The Limits to Growth*, March 2, 1972.

genesis of the modern environmental movement (Opheim 1993).

(2) *Love Canal, 1978.* In 1976, residents of a neighborhood of Niagara Falls mobilized to demand government action in investigating and remedying the appearance of chemical wastes in their neighborhood. On August 2, 1978, the New York Department of Health declared the area a health hazard and, with aid from the federal government, began buying homes and evacuating their occupants. It was determined that the neighborhood had been built on and around an abandoned waste site into which the Hooker Electro-Chemical Company had buried 21,800 tons of chemical waste from 1942 until 1953.

(3) *The Burmah Agate Oil Spill, 1979.* On November 1, 1979, the freighter *Mimosa* rammed the Liberian tanker *Burmah Agate* while anchored off the port of Galveston, Texas. The ship and its leaking cargo burned for five days, out of which leaked 10.7 million (U.S.) gallons of crude oil. A large portion of this oil washed up on the beaches of Galveston over the ensuing weeks.

(4) *The Exxon Valdez Oil Spill, 1989.* On March 24, 1989, the Exxon oil supertanker *Exxon Valdez* ran aground on Bligh Reef in Prince William Sound in Alaska. In all, 10.8 million (U.S.) gallons of crude oil coated about 1,200 miles of shoreline. Wildlife loss and charges of mismanagement resulted in unprecedented legal judgments against Exxon reaching over $5 billion, with many cases still pending.

(5) *The First Earth Day, 1970.* On April 22, 1970, nearly 20 million Americans took part in a national event on college campuses all over the country. Festivities focused public attention on the mounting awareness of environmental degradation and targeted much of their protest against corporations. For many, this event marked the coalescence of a new "environmental movement" which involved constituents from all of society (Gottlieb 1993).

(6) *Earth Day, 1990.* On April 22, 1990, Earth Day was reenacted on its twentieth anniversary. An estimated 200 million people participated in 140 nations. But, through funding of the days events and staging of special demonstration of their "green" activities, corporations were not villains, but prominent participants and organizing supporters.

(7) *The Publication of Silent Spring, 1962.* As discussed in the introduction, on September 27, 1962, the Houghton-Mifflin Company published the book *Silent Spring*. Rachel Carson, the book's author, charged that widespread application of the pesticide DDT and other synthetic chemicals was disrupting the "web of life," posing a hazard to all living organisms, including humans.

(8) *The Publication of The Limits to Growth, 1972.* Released on March 2, 1972, *The Limits to Growth* (Meadows et al. 1972) documented the results of a computer study based on the system dynamics model perfected at MIT. It concluded that mankind faced an uncontrollable and disastrous collapse within 100 years unless it moved speedily to establish a "global equilibrium" in which growth of the population and industry output were stabilized.

Data Sources

To capture data on event attention in the U.S. chemical industry in this study, we focused on how public attention is situated within one particular arena or communication channel which we see as central to these processes, the business press. While the business press is one among many public arenas within an industry, it offers some important advantages. Trade journals are one of the most critical communication and procedural channels through which industry attention is structured, providing both analyses of events and issues, and instruction to their readers on their relative importance (Clinton 1996). Research on the impact of trade journals shows that their structural position as a shared reference for knowledge transfer among industry constituents (Nederhof and Miejer 1995) makes them both a channel of communication in the early stages of industry-related policy process (Hollifield 1997) and a common reservoir for available information and interpretations. As such, the roles they play in attentional processes are multiple. First, they act as a common source of information, creating a historical record relevant to their readership based on both insiders' and outsiders' interpretations of data. Second, they act as an internal constituent of an industry, deciding which events to attend to and offering analysis and interpretation of their criticality to their readership. They are a dual force "for socialization of the young and attitude change in the old" (Webb et al. 1966, p. 78). Third, they act as conduits to other communication channels and public arenas. Trade journals actively scan other public media for their coverage of industry issues and events, recording outsiders' accounts of industry activities and industry reputation, and thereby serving as linkages between outsiders' and insiders' public attention.

The limitations in this data source are clear as well. Trade journals can be active agents engaged in processes of impression management, both by design and by cultural bias. They are organizational actors whose output is subject to the political pressures exerted by powerful figures and organizations within the industry (Molotch and

Lester 1975). And journal coverage itself is the product of a fixed system (Schlesinger 1978) inhabited by individuals who are pre-selected for their biases toward the journal's constituency, in this case industry. Trade journal coverage is, by definition, a biased interpretation of events and issues, where the bias is likely to reflect the interests and identities of its core readers and sources of information (Molotch and Lester 1975). The culture and social structure prevailing within the industry shape its content.

As a source of our data set, we reviewed event coverage in the trade journal, *Chemical Week*, and supplemented that analysis with coverage reviews in the newspapers, the *New York Times* and the *Wall Street Journal. Chemical Week* was our internal industry source, representing a reasonable indicator of the interests, identity, and perspectives of the chemical industry as they react to external events. The *New York Times* and *Wall Street Journal* were our external sources. The *New York Times* was used to represent externally situated perceptions of these events located within the general public, and the *Wall Street Journal* was used to represent perceptions within the financial community. In each case, the level and content of media coverage was analyzed to draw inferences about what issues and events were being addressed by the media constituency, as well as to what extent and through what types of interpretation and presentation. *Chemical Week* was used to represent internal industry attention to external events.

As our primary source, *Chemical Week* was one of several trade journals available. Two other prominent journals—*Chemical & Engineering News (C&EN)* and *Chemical Engineering (CE)*—serve this industry sector as well. As our rationale for choosing, we found *Chemical Week* to have coverage that was specialized to the interests of the chemical industry. Both *C&EN* and *CE* serve both the chemical and petroleum industries and *C&EN* targets academic and governmental audiences in its readership. Given this dilution in constituency, *Chemical Week* stood out as a central dedicated communication channel within the U.S. chemical industry.

Data Collection and Analysis

Our process of identifying and coding articles describing our event sample differed slightly by data source. The process ranged from initial broad-scale screening to final analysis of specific article content. For the *New York Times* and the *Wall Street Journal,* we began with the "Year in Review" compendia for each journal and collected gross data on number of articles covering a particular issue, including the date, page, and title of the article. Then each article was reviewed for content to uncover clues about the enactment of the event. Based on our theoretical interest on the social structures of attention (March and Olsen 1976, Ocasio 1997), we focused on particular players or constituencies mentioned, experts cited, companies blamed or praised, differing degrees and types of blame assessed, data presented, etc. For *Chemical Week*, we also used the "Year in Review" compendia and the *Business Periodicals Index* to identify and code the number of specific articles on a particular event. However, in this data we also went deeper, scanning the journals themselves for a more accurate and complete review of articles of importance. We began our review six months before the event and ended three years after the event, searching for similar content as with the *New York Times* and *Wall Street Journal*.

With such content data, we began our analysis. We used the number of *Chemical Week* articles as a measure of industry-level public attention. We used *New York Times* and *Wall Street Journal* coverage as a measure of public attention by outsiders. These measures implicitly treat attention as a discrete activity, with each article as a separate occurrence of attentional processing within an industry's communication channels (Ocasio 1997). The measures of attention and interpretations of industry events gathered from press publications were complemented with data and observations obtained from secondary sources (Erskine 1971, Evernden 1993, Scheffer 1991, Schmidheiny 1992, Gottlieb 1993, Cairncross 1995, Hoffman 1997).

Case Comparison Method

We began our analysis by undertaking between-case comparisons of industry-level attention based on existing theory, seminar discussions, and pilot tests on other types of events. We proceeded to review event coverage in relation to our developing model of event attention within the U.S. chemical industry. Our analysis was guided by a metatheory derived from research on attention and identity, as described above. We relied on an analytical process that combines induction with deduction (Miles and Huberman 1984) to develop an explicit model of how the industry structures attention to nonroutine occurrences.[1] We used data reduction and data display methods to draw and verify our conclusions. The analytical process that followed involved repeated iterations, moving back and forth between our emerging model and the quantitative and qualitative data. Through successive iterations, we converged on a final model that best fit the empirical data and provided a coherent theoretical explanation of the industry-level attentional process. In addition to the theoretical model, we proceeded to develop a set of hypotheses inferred from the case observations.

Analysis of Cases

Question 1: Event Attention

Table 2 presents the analysis of discrete levels of attention for the events selected, both for the first month and for the first year immediately following the event. We found several patterns of interest that helped guide our answers to the first research question—what social structures of attention help determine whether an event is attended to by the industry or not? First, two events received no attention in *Chemical Week*: the Cuyahoga River fire and the *Burmah Agate* oil spill. Two events received high levels of attention that persisted through the year: the publication of *Silent Spring* and Love Canal. One event, Earth Day 1990, had a high level of coverage in the first month and moderate levels of attention overall, but no industry (or external) press coverage in the subsequent year. In short, the initial findings show great variance in the levels of insider and outsider public attention among the events studied.

Our initial examination of the data supports the proposition that selective attention to events is not shaped by the objective characteristics of an event, but by its enactment. For example, several of our sample events were designed as control pairs for analysis based on environmental and technical measures of similarity. The *Exxon Valdez* and the *Burmah Agate* oil spills, for example, were of roughly the same magnitude in terms of oil spilled—10.7 million (U.S.) gallons. Yet this objective measure does not reveal the reasons why the *Exxon Valdez* spill resulted in a public outcry and government response that was unprecedented while the *Burmah Agate* spill was hardly noticed. Internally as well, the *Burmah Agate* was not mentioned in *Chemical Week*, while the *Exxon Valdez* garnered coverage—modest in *Chemical Week* and extreme in the *New York Times* and *Wall Street Journal.* Public attention was not based on the amount of oil spilled.

We also found little evidence for the idea that the level of external media coverage explains public attention at the industry level. Table 2 shows that, of the eight events studied, the *Exxon Valdez* and Earth Day 1970 were noted as critical events by the general press and financial communities, while receiving low or moderate levels of attention by the chemical industry. Those that received the greatest public attention by the chemical industry—*Silent Spring* and Love Canal—received the second and third most coverage in the *New York Times* and the *Wall Street Journal*. This suggested that to understand the effect of external attention we had to focus not on the level of attention they received, but on whether and how events were enacted (Weick 1979) by the internal and external press.

Enactment of Events. We focused on the paired comparisons of how comparable types of events were enacted, both by *outsiders* and by *insiders*. The contrast between the level of public attention to the Cuyahoga River fire

Table 2 Industry Attention to Environmental Events

	Event	*Silent Spring*	Cuyahoga River Fire	Earth Day	*Limits to Growth*	Love Canal	*Burmah Agate*	*Exxon Valdez*	Earth Day Anniversary
	Date	1962	1969	1970	1972	1978	1979	1989	1990
Chemical Week	1 month coverage	2	0	2	1	4	0	0	6
	1 year coverage	10	0	3	1	10	0	2	6
New York Times	1 month coverage	6	0	13	6	9	15	7	33
	1 year coverage	21	0	31	14	35	31	124	33
Wall Street Journal	1 month coverage	1	0	3	3	0	0	9	2
	1 year coverage	4	0	5	3	0	0	108	2
Industry Attention		[high] Sustained.	[none]	[moderate] Short-term.	[low]	[high] Sustained.	[none]	[low]	[high] Short-term
Outsiders' Attention		[high] Sustained.	[none] Limited to Cleveland.	[high] Sustained.	[moderate] Sustained.	[high] Sustained.	[high] Sustained.	[high] Sustained.	[high] Short-term.

Number of Articles Published in *Chemical Week*, *New York Times,* and *The Wall Street Journal* (one month and one year following the event.)

and the contrasting case of Love Canal was initially the most striking, as the complete inattention to the fire in *Chemical Week*, the *New York Times*, or the *Wall Street Journal* was quite unexpected. This fire was a rather unusual event in that it was oily waste and debris on the water's surface that was burning, leaving two wooden railroad bridges damaged and inoperable in its wake. The lack of business press attention to this river fire became an important puzzle in our attempt to elucidate the causes of industry-level attention to events. In fact, while the concept of a river so polluted as to ignite would be exceptional by present-day standards, we were equally surprised to find no coverage in the national press. Why was this event, later immortalized by environmentalists (Opheim 1993, Browner 1994) and made the subject of a popular song by Randy Newman, not attended to by the business or national press?

We found a very different level of attention for our contrasting case, the Love Canal. Unlike the Cuyahoga River fire, this event caught the attention of *Chemical Week*, as well as the *New York Times* and *Wall Street Journal*. To explain the distinction between these two events, we looked deeper into their coverage—how they were enacted by media sources both internal and external to the industry. Given our lack of coverage for the Cuyahoga River fire, we supplemented our data with coverage from the local newspaper, the *Cleveland Plain Dealer*, where the fire garnered a front-page story the day after the occurrence and subsequent follow-up through the week. These stories, however, were not about water pollution or industry contamination. Rather, they were about the hazards associated with "oil slick" fires. None of the articles assigned blame to any specific company or industry. Editorials challenged the state and city to find the industries responsible "if it can ever be determined who they were." They treated the incident as an embarrassment to the city, complaining that "we are tired of Cleveland being the butt of a joke" and criticizing "the usual amount of oily gunk that has given the river and the city a bad name for years" (*The Plain Dealer* 6/25/69, p. 10-A).

In contrast, the declaration of a health hazard in the neighborhood of Love Canal was enacted as a pollution issue first and foremost. From the start, the event had a clear villain who was assessed blame—the company which had created the buried toxic waste, the Hooker Chemical Company. Early *New York Times* articles reported angry calls for cleanup financial assistance from Hooker, "either voluntarily or through court mandated cost sharing funds" (*New York Times* 8/6/78, p. 24). But the event also called into question the past disposal of hazardous wastes by all members of the chemical industry. As part of extensive and continuing coverage that included each day of the first week, the *New York Times* released a list of New York firms using toxic chemicals and a pledge by the NYS Environmental Conservation Commissioner to probe their waste-handling practices (*New York Times* 8/9/78, p. 1). In contrast, *Chemical Week* coverage began a week after the announcement, on August 9. While this week delay is an artifact of the journal's weekly publication format, the extent of that coverage began low in volume and content. The first coverage was only one article, filling less than one column and describing the specific facts of the case as they applied to Hooker Chemical. Deeper coverage did not begin until August 16. First, an editorial defended both Hooker as bearing "no legal liability" and "the overall record of chemical producers acting to the benefit of man." It also argued that action should be taken "not by Washington or state capitals but by the chemical industry" (*Chemical Week* 8/16/78, p. 5). Second, a two-page article in the same issue continued the defense of industry practice in waste disposal. While acknowledging that "there is really no way to tell," it argued that "it seems unlikely that a combination of circumstances could lead to similar circumstances" elsewhere in the country (*Chemical Week* 8/16/78, p. 15).

Outsiders' Enactment of Events: The Attribution of Accountability. Our examination of the Cuyahoga River fire and Love Canal suggests that how nonroutine events are enacted (Weick 1979) by external media shapes whether they receive public attention by the industry press. In comparing these two events we observed that they differed on whether or not the industry and its members were held accountable. While the Cuyahoga River fire could have been attributed to chemical industry activities, no chemical companies were named within the local press and no articles were written at the national level. Instead, the fire was enacted as a problem for the city, not the industry, and Cleveland was held accountable for the event. Public attention was directed towards Cleveland's pollution problems. While the reputation of Cleveland was at stake, the chemical industry's reputation was unaffected by the fire. We infer that this failure to hold the industry accountable for the event helps explain why it did not receive attention by *Chemical Week*. Similarly, it appears that Cleveland's accountability for the event was not of sufficient interest to the *New York Times* or the *Wall Street Journal*.

On the other hand, as we discussed above, responsibility for the Love Canal waste dump was attributed directly to chemical industry activities. External sources

held the industry and one of its members, Hooker, accountable for the event. Both the Cuyahoga River fire and Love Canal show that enactments of events trigger an attribution of accountability (Tetlock 1990) in the public media. The key difference between the two events is which collective actor is held accountable for the event. In those cases in which the chemical industry is held accountable, the event becomes socially salient for industry members and therefore receives public attention in the industry press.

According to Tetlock (1990), information processing by individuals is a political process, as individuals are concerned about whether others hold them accountable for specific actions or events. According to this view, a key aspect of the enactment of an event is the determination of accountability. Attributions for the causes of events are characterized by holding particular individuals, groups, firms, industries, or sectors accountable for their occurrence. Consequently, we propose that Tetlock's insights on accountability at the individual level may be extended to the industry level. Individuals' concerns with their accountability is affected by their individual identity. Similarly, and as suggested by our case comparison, industry members are concerned with the industry's accountability for an action or event, as shaped by the collective identity of industry members. Industry members are concerned with the accountability for their actions and outcomes based on how this accountability shapes their reputation (Elsbach 1994). Outsiders can directly influence this process by holding an industry and its members accountable for actions, events, and outcomes. Industry members and the industry press are concerned with the industry's accountability. This concern with an industry's accountability for an event makes the event salient for industry members and triggers initial industry attention.

Based on the contrasts between these two events, we initially hypothesized that if there is not outsiders' attribution of accountability, then the event is unlikely to be attended. In examining our remaining cases we found, however, that outsider accountability, while a sufficient condition to trigger attention to an event, does not appear to be a necessary condition. This led us to consider not just outsiders' attributions of accountability, but insiders' attributions in shaping public attention by the industry.

Looking at the coverage comparisons in Table 3, the relation between external and internal examination appears to show that external attribution of accountability is a sufficient condition to generate industry-level attention. Where players external to the industry attributed accountability for certain events to the chemical industry—*Silent Spring*, the first Earth Day, Love Canal, and Earth Day 1990—the chemical industry paid attention to the event. But other events where external accountability was absent—*The Limits to Growth*, and the *Exxon Valdez* oil spill—were also attended to by the industry press. This suggests that other dynamics were at play. We sought our clues as to what those dynamics might be in the next pair of cases.

Insiders' Enactment of Events: Attention to Industry Image. The *Burmah Agate* and the *Exxon Valdez* oil spills were of similar proportions (roughly 10.7 million (U.S.) gallons). In neither case would it be likely that outsiders could attribute accountability for the event to the chemical industry. Outsiders to the industry enacted the *Burmah Agate* as a maritime issue and the *Exxon Valdez* as an oil pollution issue. In addition, external coverage of the *Burmah Agate* was light compared to the *Exxon Valdez,* addressing the attempts by firefighters to extinguish the flames on the floating wreck, keep the undamaged oil-filled compartments from rupturing, and contain the released oil. Stories about clean-up efforts on the Texas beaches were barely covered. External coverage of the *Exxon Valdez* was intense, chronicling a story of a damaged environment, injured or killed animals, and alleged mismanagement by the Exxon Corporation and its employees. This made the company into a visible villain and the primary subject of coverage. While enacted in different forms, each were catastrophes involving oil, not chemical industry activities. But while the *Burmah Agate* received no attention within *Chemical Week*, the *Exxon Valdez* was the subject of several articles. Our question was—why?

In searching for this answer, we became interested in exploring the linkages between the construct of accountability and challenges to the image of the industry. Linking existing theory to our inferences about the effects of accountability, we examined whether the search for accountability could take the form of an examination of the event's threat to the image of the industry by internal constituents. In the case of the *Exxon Valdez*, *Chemical Week* coverage centered on the use of chemical and biological dispersants to break up the spill, particularly those developed by Exxon Chemical, a wholly owned subsidiary of Exxon Corp. The success or failure of these dispersants could reflect on the image of the industry with respect to its ability to use its technology to find a solution to this environmental problem. So, while direct accountability in either case had no implications for the chemical industry, the industry's concern with image was triggered, not by who was accountable for the *Exxon Valdez* spill, but for its cleanup. This led us to consider how the industry's self-examination of its image led to industry attention for the event.

Table 3 Industry Attention to Environmental Events: Outsiders' Attributions of Accountability/ Insiders' Examination of Industry Image

Event	*Silent Spring*	Cuyahoga River Fire	Earth Day	*Limits to Growth*	Love Canal	*Burmah Agate*	*Exxon Valdez*	Earth Day Anniversary
Date	1962	1969	1970	1972	1978	1979	1989	1990
Insiders' Examination of Image (*Chemical Week*)	[high] Challenge to industry identity and viability of an important industrial product.	[none]	[low] Chemical industry feels secure in its legitimacy.	[moderate] Possibility of another *Silent Spring.*	[high] Challenge to responsible management practices within the industry.	[none]	[moderate] Challenge to industry's ability to provide solution to environmental problem.	[high] Chemical industry sees opportunity to project positive image in pollution reduction.
Outsiders' Attribution of Event Accountability (*NYT* & *WSJ*)	[high] Safety of chemical products questioned.	[none]	[moderate] Chemical companies are among corporations targeted by protesters.	[low] Chemical industry is not singled out.	[high] Event creates questions of other waste sites and cleanup responsibility.	[none]	[low] Only chemical industry involvement regards cleanup technology.	[moderate] Chemical industry viewed as positive participants.
Industry Attention	[high] Sustained.	[none]	[moderate] Short-term.	[low]	[high] Sustained.	[none]	[low]	[high] Short-term
Outsiders' Attention	[high] Sustained.	[none] Limited to Cleveland.	[high] Sustained.	[moderate] Sustained.	[high] Sustained.	[high] Sustained.	[high] Sustained.	[high] Short-term.

Linking accountability to image, the determinants of industry attention were most clearly elucidated by contrasting *Silent Spring* with *The Limits to Growth*. While *Silent Spring* represented outsiders' attribution of the industry's accountability, *The Limits to Growth* did not. Its critique of industrial activity was extremely wide in scope, offering no direct assessment of blame for chemical industry activities in particular. Both events did, on the other hand, present challenges to industry image that triggered internal attention. And, interestingly, we found that the challenge posed by the second event was related to the first. *Silent Spring* challenged the identity of the entire chemical industry, not just of DDT producers. *The Limits to Growth* triggered an examination of whether this book was describing "The Ultimate *Silent Spring*?" (*Chemical Week* 3/15/72, p. 40). Given the effect of *Silent Spring* on the image and identity of the chemical industry, the publication of *The Limits to Growth* triggered an internal examination of the potential impacts of the new book on the industry's image.

The examples of the first Earth Day in 1970 and the Earth Day anniversary in 1990 helped to validate our inferences of the roles of outsiders' attributions of accountability and internal examination of image. Each was a national celebration, designed to increase awareness and understanding of the threats to the natural environment. But in fact, each was enacted in a very different way, triggering different attentional processes within *Chemical Week*. Both of these related events received attention within *Chemical Week*, yet each for different reasons. The first Earth Day represented outsiders' (student protesters and the media) attribution of the chemical industry's accountability for environmental pollution. Coverage in the *New York Times* highlighted how organizers "refused to accept money from industries causing pollution" (*New York Times* 4/22/70, p. 35) and described how industry and government officials were the primary targets of protests (*New York Times* 4/23/70, p. 1). Yet these events triggered no internal examination within *Chemical Week* of the industry's image. The event was constructed as just another day of protest for which chemical manufacturers saw little legitimacy. As an examination of the press coverage revealed, the industry felt it needed just a "Chance to state its case" (*Chemical Week* 3/4/70, p. 64), and the grounds for its activities could be legitimated. The different enactments of the event in *Chemical Week* and the *New York Times* suggest that while outsiders' attribution of accountability affected the external reputation of the industry, the chemical industry remained unconcerned with its image, as they discounted the importance of student protests and did not see their identity threatened.

Following the event, despite the student protests, *Chemical Week* framed the day as a success—"On balance it was a good day for industry" (*Chemical Week* 4/29/70, p. 8), "industry achieved a rational dialogue and avoided a hostile confrontation with militant young anti-pollutionists" (*Chemical Week* 4/29/70, p. 33).

For Earth Day 1990, the attribution of accountability of the industry by outsiders was enacted in positive rather than negative terms. The *New York Times* reported that "this multimillion dollar orchestration of the event bore little resemblance to the grass roots movement driving the event twenty years before" (*New York Times* 2/22/90, p. 26). The chemical industry was a central and cooperative participant in a relatively peaceful event. In addition, there was a proactive internal examination of the event's implications for the industry image. *Chemical Week* began coverage of the event four days early with a "special report" calling the event a "challenge and an opportunity for the CPI (chemical processing industry)" (*Chemical Week* 4/28/90, p. 20). Coverage within the *New York Times* began before the event as well, but this coverage focused on the activities of planners and the festivities for the day. Articles focused on protests against "corporate destruction of the environment" (*New York Times* 4/24/90, p. B5) and corporate intentions to look "green." As in the coverage of the industry's efforts to abate pollution in the *Exxon Valdez* spill, the journal's coverage of Earth Day served to preserve the industry identity as a positive social force. *Chemical Week* devoted a cover page story to the event, proclaiming that, despite "barely noticing the first Earth Day 20 years ago" (*Chemical Week* 4/18/90, p. 20), they now abided by the ethic that "Earth day is every day for us" (*Chemical Week* 4/18/90, p. 5). An examination of press coverage reveals the industry's concern with preserving its image. The special issue was a collection of articles that described the environmental protection activities of major corporations such as Ciba-Geigy, Monsanto, and Dow Chemical, all emphasizing the great strides made by chemical companies in the environmental arena.

The two Earth Days highlight how both outsiders' attribution of accountability and insiders internal examination of event implications can trigger industry attention. Love Canal highlights how both forces can play in tandem. Outsider attribution was directed at a central character in the chemical industry (Hooker), while the event in general called into question the responsibility of all chemical manufacturers in the past formation of abandoned hazardous waste sites and their present-day waste management practices.

To sum up thus far, we have identified two constructs that will trigger industry attention to external events. We inferred that outsiders' attributions of the industry's accountability for the event (as evidenced by accounts in the *Wall Street Journal* and the *New York Times*) can trigger industry attentional processes. We also inferred that internal examination of the threat posed by the event to the image of the industry can trigger industry attentional processes (as measured by accounts in *Chemical Week*). Combining the two, we also infer that either form can be at play, singularly or in tandem. The combined evidence drawn from the eight cases leads us to posit the following:

HYPOTHESIS 1: OUTSIDERS' ATTRIBUTION OF ACCOUNTABILITY. *The greater the extent to which outsiders attribute direct accountability and responsibility to the industry for the event, the greater the likelihood that it will be attended to in the business press.*

HYPOTHESIS 2: INSIDERS' EXAMINATION OF IMPLICATIONS FOR THE INDUSTRY'S IMAGE. *The greater the extent to which insiders examine an external event as a potential threat to the industry's image, the greater the likelihood that it will be attended to in the business press.*

For Hypotheses 1 and 2, we further considered the direction of causality—whether outsiders' attribution of accountability and insiders' examination of image were causes or effects of public attention. For Hypothesis 1, outsiders' attribution of accountability to the chemical industry were reported in the *New York Times* and *Wall Street Journal* prior to press coverage in *Chemical Week*. This temporal sequence strongly supports the view that outsider's attribution of accountability was a cause rather than a consequence of industry-level attention, at least initially. Once attended to, these outsiders' attributions are likely to be reinforcing. For Hypothesis 2 the evidence is more indirect as we cannot observe internal enactments of the threats of industry image until they are recorded in the industry press. While data limitations do not allow us to discard the alternative hypothesis that the decision to publish causes an internal examination of industry image, it is significant to note that for those events receiving industry attention without external attributions of accountability, the examination of industry image was a key component of the first article published. This is true both for *The Limits to Growth* and for the *Exxon Valdez* oil spill. This suggests that the examination of the industry image temporally preceded the external attribution of accountability. However, public attention to an external event is likely to lead to increased self-examination of an industry image (Dutton and Dukerich 1991), whether the initial public attention was driven by outsiders' or insiders' initial enactments of the external events.

The Social Structures of Industry Attention. With the search for accountability of an event and the threats to the industry's image established as two possible routes toward triggering event attention, we were interested in understanding more deeply how these two forces can manifest themselves in the specific process of event attention. Consistent with our first research question, we decided to examine the social structures of attention (Ocasio 1997). In Table 4 we summarize our analysis, presenting a comparison of the rules of the game, the status of the players, and the implications for the core technology. To ascertain the causal direction in our analysis, we examined the social structures of attention as they existed prior to the event being publicly recorded in the industry press. As Fine (1997) suggests in his study of public attention to the "problems of Hollywood," to understand how events are enacted we must first examine the social conditions prevalent at the time they are enacted. Our objective was to examine the theoretical categories drawn from previous research on attentional processing, and use these categories in a between-case comparison (Eisenhardt 1989) of factors to infer more specific mechanisms on how they influence attention to events.

We first considered how the shift over time in the environmental strategies and rules of the game within the industry might affect industry attentional processes. The *rules of the game* are the formal and informal principles of action that guide decisionmakers in the industry. Here we note that the chemical industry's concern with its image is affected by the prevailing rules, norms, and beliefs regarding environmental issues and the corporation's role in protecting it. Hoffman (1999) highlights four stages of development in these rules that we use to identify prevailing rules of the game. In the first stage (Industrial Environmentalism, 1962–1970) industry remained firm in its beliefs that environmental problems could be solved independently and through technological development. In Stage Two (Regulatory Environmentalism, 1971–1982), the Environmental Protection Agency (EPA) became the arbiter of environmental rules and norms, and environmental management became synonymous with regulatory

Table 4 Industry Attention to Environmental Events: Structural Factors

Event	*Silent Spring*	Cuyahoga River Fire	Earth Day	*Limits to Growth*	Love Canal	*Burmah Agate*	*Exxon Valdez*	Earth Day Anniversary
Date	1962	1969	1970	1972	1978	1979	1989	1990
The Congruence of the Rules of the Game with Responsible Environmental Practices.	[low] Industrial Environmentalism	[low] Industrial Environmentalism	[low] Industrial Environmentalism	[moderate] Regulatory Environmentalism	[moderate] Regulatory Environmentalism	[moderate] Regulatory Environmentalism	[high] Strategic Environmentalism	[high] Strategic Environmentalism
The Status of the Players	[high] Industry, scientists, the media, politicians.	[low] The City of Cleveland.	[high] Large corporations, environmental activists, the media.	[moderate] MIT, government.	[high] Hooker Chemical Company, The US Army, President Carter, CERCLA	[low] British Burmah Oil Company, Galveston.	[high] Exxon Oil Corporation, Prince William Sound, environmental activists, government.	[high] Large corporations, environmental activists, the media.
The Implications for the Core Technology	[high] Chemical products.	[none]	[moderate] Industrial activity	[low] Societal systems	[moderate] Waste management as ancillary to central production processes.	[none]	[low] Spill cleanup technology.	[moderate] Industrial activity.
Industry Attention	[high] Sustained.	[none]	[moderate] Short-term.	[low]	[high] Sustained.	[none]	[low]	[high]Short-term
Outsiders' Attention	[high] Sustained.	[none] Limited to Cleveland.	[high] Sustained.	[moderate] Sustained.	[high] Sustained.	[high] Sustained.	[high] Sustained.	[high] Short-term.

compliance. In Stage Three (Environmentalism as Social Responsibility, 1983–1988) industry began to acknowledge that the environmental problem will not disappear and began to take a more prominent role in establishing environmental rules and norms as a signal of its social responsibility. In the fourth stage (Strategic Environmentalism, 1989–1993) industry began to take a proactive stance on environmental protection as it once again perceived the problem as one it could handle itself. In this latter stage, outsiders' attributions and internal image became tightly linked with environmental issues as corporate initiatives to develop a "green" identity became more critical. An examination of the relationship between industry-level attention and the rules of the game led us to posit the following hypothesis:

HYPOTHESIS 3: THE CONGRUENCE OF THE RULES OF THE GAME WITH RESPONSIBILITY FOR THE EVENT. *The greater the congruence of the rules of the game with potential industry accountability for the external event, the greater the examination of industry image and the greater the level of industry attention to external events.*

A comparison between the first Earth Day and its reenactment in 1990, as well as a comparison between the *Burmah Agate* and *Exxon Valdez* oil spills, highlight the phenomenon described by Hypothesis 3. While each of these event pairs were constructed around similar objectives, industry placed more importance on the latter events as they were consistent with its efforts to project a "green" identity. But an in-depth examination of *Silent Spring* and its comparison with *The Limits to Growth* suggested to us the need to look for further structural determinants of industry attention.

While external and internal coverage of *Silent Spring* was high and the event was enacted in a way that clashed with the existing rules of the game—namely the preeminence of technological development (Florman 1976, Hoffman 1997)—attention to *The Limits to Growth* was low. To explain why, we observed that the attentional processes related to these two events were very different. First, the publication of *Silent Spring* triggered the involvement of many high-status players. It was serialized in the *New Yorker* magazine and drew attention from many prominent actors including President Kennedy, the Department of Agriculture, the National Academy of Sciences, the Audubon Society, the Manufacturing Chemists Association, the National Agricultural Chemicals Association, and the Audubon Society. *Chemical Week* articles asked questions such as "what to do about Rachel Carson" (*Chemical Week* 9/22/62, p. 107) and focused heavily on the commentary of executives from corporations such as Monsanto—which published a parody of the book (*Chemical Week* 10/6/62, p. 23)—and American Cyanamid—which devoted one of its top research scientists as spokesman for the chemical industry in telling the "industry's pesticide story" (*Chemical Week* 11/10/62, p. 29). Likewise, *The Limits to Growth* triggered the involvement of prominent actors such as its sponsors, the Club of Rome and MIT, as well as prominent scientists, government officials, and corporate representatives, but not to the same degree as *Silent Spring*.

This leads us to infer that an event is more likely to trigger insiders' examination of industry image if it targets a high-status player or if the attributing actor is itself a high-status player. The *status of the players* involved in the interpretation of an event grants it social saliency (Fiske and Taylor 1991) within the industry. High-status players are the individuals and groups who (through their social influence, power and control) influence and regulate the decision and activities relative to the event in question. They are more representative of the acknowledged image of the entire field and serve to intensify interest and increase attention on a particular occurrence. For example, in the Cuyahoga River fire no players were named by the *Plains Dealer* and in the case of the *Burmah Agate* spill, only a low-status player was triggered—the British Burmah Oil Company which owned the tanker. The *Exxon Valdez*, of course, triggered the high-profile identity of the Exxon Corporation. In the case of Love Canal, initial *New York Times* attention focused heavily not only on Hooker Chemical, but also on the high status of the U.S. Army, publishing charges that the agency had dumped chemical warfare materials into the canal (*New York Times*, 8/2/78: 1). Further, this event captured the attention of President Carter who, in an election year, used the event as a motivator for the 1980 enactment of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or Superfund. Under this act, chemical companies (among others) would be charged a feedstock tax to cover its funding and, more importantly, would be responsible for cleaning up the thousands of other abandoned waste sites around the country (Scheffer 1991). This leads us to the following hypothesis:

HYPOTHESIS 4: THE STATUS OF THE PLAYERS. *The greater the status of the players involved or affected by the event, the greater the likelihood that it will trigger an examination of an industry's image and the likelihood of industry-level attention.*

We observed, further, that if an event has implications for the *core technologies* of organizations in the industry and the process by which it accomplishes its goals, it will be more likely to draw attention. These technologies are

the set of tangible and intangible assets involved in the production of goods and services relative to the event being examined. For example, *Silent Spring* (and Earth Day 1970) presented a direct challenge to the core technologies of the industry, namely chemical products and production processes (Florman 1976, Pillar 1991). *The Limits to Growth*, on the other hand, was classified in terms of the long-standing Malthusian argument of limited resources on a broad societal scale. It presented a challenge to industrial systems in general and not chemical industry technology in particular. The *Burmah Agate* and *Exxon Valdez* spills had implications for ancillary aspects of industry activities—material transport and cleanup technology. This contributed little to the industry-level attention they received. Love Canal had moderate implications for the industry's core technology. Although articles in *Chemical Week* treated the issue as a new problem for which it could not be held accountable, arguing that this was the "standard disposal practice of the 1940s and 1950s" (*Chemical Week* 8/16/78, p. 15), most chemical companies had waste materials to be handled and likely had connections to a series of abandoned waste sites like Love Canal. Therefore, the event cast a critical light and new challenge on all chemical production processes.These observations led us to develop our fifth hypothesis:

HYPOTHESIS 5: THE IMPLICATIONS FOR THE CORE TECHNOLOGY. *The greater the determinants or consequences of the event on the core technology of industry members, the greater the examination of the industry image and the likelihood of industry-level attention.*

Question 2: Events as Issues

Of all the events publicly attended, only a few receive sustained attention and become critical issues for the industry. As per our Research Question 2, we continued our analysis to consider why this might be so. As we observed in Table 2, two events received significantly more sustained internal attention than the others—*Silent Spring* and Love Canal. For the other four events attended to, little or no attention to the event was received after the first month. While a search for accountability can bring the event into the realm of the industry's attention, the industry then responds to and accounts for the event (Elsbach 1994), and continues to attend to the event or not. For purposes of our discussion, we classify those with continuing attention as critical issues and those whose public attention is more ephemeral as noncritical. Extending the definition of issues to the industry level, we define *critical issues* as events, developments, and trends that members of the industry recognize as having important consequences for the industry and which receive continued attention (Dutton 1988, Elsbach 1994).

In examining the events that received industry attention we observed that some events, such as *Silent Spring* and Love Canal, invoked heated debate among various players over their meaning and implications and became critical issues while others did not (see Table 5). Elsbach (1994) found a similar process in her study of the construction of verbal accounts by the cattle industry, where she observed either denials or acknowledgments of external accounts leading to debates over accountability.

In our between-case comparison, we observed that the more contested the varying interpretations of meaning, the more sustained the levels of attention, and, in turn, the greater likelihood an event will emerge as an issue for an industry. For example, *Silent Spring,* as we noted previously, invoked a debate among high-status players over the safety and ethics of pesticide application and synthetic chemical production. For the chemical industry, the book came to exemplify an ongoing public misunderstanding of scientific advancement, and the perceived opposition to that advancement from environmentalists. In the face of tremendous outcry the industry, concerned with maintaining its image and identity, saw a need for balanced consideration of the risks and benefits of chemical technology and products. One *Chemical Week* editorial presented a defense of the industry's identity from environmentalist attacks, "in pest control—as in medicine, law, or international diplomacy—we must weigh risks against benefits . . . Is the survival of civilization worth a few pounds of fallout?" The journal dismissed those challenging this notion as "a motley lot ranging from superstitious illiterates and cultists to educated scientists" (*Chemical Week* 7/28/62, p. 5) and argued that the chemical industry's "research is aimed at profit through knowledge—not the sale of more and more pesticides whether they kill us or not. Such a 'public be damned' attitude was outmoded some years ago" (*Chemical Week* 7/14/62, p. 5). A faith in this argument was a recurring theme in response to Love Canal as well. *Chemical Week* argued that, although waste sites were an issue of concern, industry accountability was low since "Every so often something goes wrong" (*Chemical Week* 8/16/78, p. 5). The event became a battle ground among environmental groups, the media, the legal community, and industry over responsibility for a newly emerging by-product of chemical production, abandoned hazardous waste sites.

We propose that both Love Canal and *Silent Spring* received sustained industry attention because they represented competing enactments over the degree of accountability of the industry. In each case, the event was

Table 5 Industry Attention to Environmental Events: Contestation over Event Interpretation

Event	*Silent Spring*	Cuyahoga River Fire	Earth Day	*Limits to Growth*	Love Canal	*Burmah Agate*	*Exxon Valdez*	Earth Day Anniversary
Date	1962	1969	1970	1972	1978	1979	1989	1990
Contestation over Interpretation of Event	[high] Different views of the risks and benefits of synthetic chemicals.	[none]	[low] Debate with environmentalists remains unjoined.	[low] Argument rejected by mainstream academics.	[high] Differing views on the standards for responsible waste management and site cleanup.	[none]	[low] Limited attention to spill cleanup technology.	[low] Again, debate with environmentalists remains unjoined.
Industry Attention	[high] Sustained.	[none]	[moderate] Short-term.	[low]	[high] Sustained.	[none]	[low]	[high] Short-term
Outsiders' Attention	[high] Sustained.	[none] Limited to Cleveland.	[high] Sustained.	[moderate] Sustained.	[high] Sustained.	[high] Sustained.	[high] Sustained.	[high] Short-term.

enacted by the chemical industry as critical to its' identity. More than just article coverage in *Chemical Week*, *Silent Spring* received more editorial coverage than any of the other events in this study. And Love Canal was considered so important to the identity of the industry that *Chemical Week* introduced a new department called "disposal" as a monthly feature to "focus on happenings in the area of managing hazardous wastes" (*Chemical Week* 11/1/78, p. 67). In both cases, outsiders' enactments of the events contradicted the industry's own identity, leading to continued discrepancy and contestation between insiders and outsiders over the event's enactment.

In contrast, contestation over the interpretations of *The Limits to Growth* and the *Exxon Valdez* spill remained low. The book *The Limits to Growth* came and went within the pages of the journal with only one review. The industry's identity was not threatened and no debate was initiated, and contestation over the *Exxon Valdez* spill centered on the responsibility of Exxon and the ship's captain. It triggered familiar routines, being similar in technology and content to that of oil spills dating back to the 1960s. One article explicitly cited comparisons to the *Torrey Canyon* oil spill in 1967 (*Chemical Week* 5/31/89, p. 6). While a low level of contestation over the efficacy of dispersants triggered some discussion within *Chemical Week* and the *New York Times*, it appeared that the members of the chemical industry did not dispute their questionable abilities and results. Given their unproven track record, if the dispersants did not work, the negative implications would be minor. If they did work, the positive implications would bolster industry identity and image. In the end, while attended to by the industry, the event did not contradict the industry's identity or become an issue of important consequence.

Similarly, Earth Day 1970 marked the formation of a new form of organized protest and resistance to industrial pollution, but chemical manufacturers enacted the event as being of limited consequence for the industry. There was no real engagement between the chemical industry and this newly emerging environmental movement. The 1990 reenactment of Earth Day also remained an unjoined debate. This time there was no confrontational environmental movement to engage. The combined evidence from our case comparison leads us to our sixth and final hypothesis:

HYPOTHESIS 6: CONTESTED ENACTMENTS: *The greater the contradiction between outsiders' enactment of the event and the industry's identity, the greater the contestation between insiders and outsiders over the enactment of the event. The greater the contestation over the event's enactment, the greater the likelihood the event will receive high and sustained levels of attention.*

A Model of Industry Attention to Events

We combine the insights derived from our cross-comparison of cases into an overall theoretical model, shown in Figure 1. The model was developed from our data analysis and verification, as informed by theory on attention and identity. Consistent with our research question, the model distinguishes between the industry's initial public attention to an event, and whether public attention is sustained and leads to the enactment of the event as critical to the industry.

In Figure 1 the solid boxes contain key constructs directly observed and recorded for all the cases studied. The solid lines depict the theoretical relationships that are the foci of this paper. The boxes surrounded by dotted lines show constructs that were not directly observed or recorded but that emerged from the analysis. The dotted-line relationships depict relationships between constructs that also emerged from the analysis of cases, but which were not directly part of our research questions.

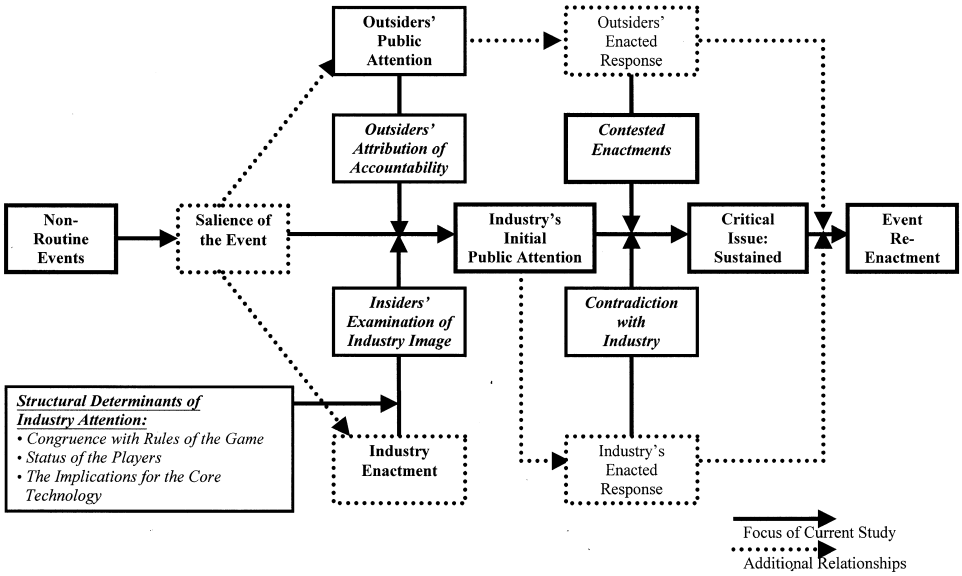
Nonroutine Events. In the model, an industry's external environment is a source of constant stimuli. External events are constantly emerging, at times provoking industry-level attention and at other times being ignored. The model focuses on attention to nonroutine events which depart from the normal ongoing industry activities, and for which responses are not readily available.

Salience of the Event. While social salience was not an initial focus of our study, our research findings show that the salience of an event to the industry distinguishes whether an event is initially attended to or not. According to cognitive research, social saliency is a key determinant of whether a stimuli such as an external event is attended or not (Fiske and Taylor 1991, 247–254). *Social salience* is defined as the prominence or importance of a stimulus to a particular social context. Both outsiders' attribution of accountability and insiders' examination of an industry image increase the saliency of an event for the industry and will therefore receive public attention by the industry. Events that are not socially salient for the industry, such as the *Burmah Agate* and the Cuyahoga River fire, are not attended to. The six other events were all viewed as salient to the industry, either by outsiders or by insiders. Our research and model differs from past theory, however, which suggests that critical novelty and incongruity, key characteristics of the salience of an event, are a precursor to public attention and sense-making (Starbuck and Milliken 1988, Hilgartner and Bosk 1988, Weick 1995). While novelty or incongruities alone may be necessary conditions they are insufficient to explain public attention. As we discovered in our analysis, while both the discovery of hazardous waste pollution in Love Canal and the Cuyahoga River fire in Cleveland were novel events, the former gained the sustained attention of the national, financial, and chemical industry press, while the latter passed unattended. Our model posits that the salience of the event to an industry is moderated by outsiders' public attention to an event and by insiders' enactments of the event.

Outsiders' Public Attention. As noted earlier in our analysis, the level of outsiders' public attention to an event was imperfectly related to the industry-level attention. In examining its effects, our model focuses instead on how outsider's attention linked the event to the industry.

Insider's Enactments. The variety of insiders' enactments of the events were not directly observed, but were only recorded when the event was publicly attended. Our data suggests, however, that whether and how an event is attended to by the industrial sector is the product of many factors beyond any strict assessment of its objective

Figure 1 A Model of Industry Attention to External Events



characteristics, but is affected instead by how insiders enacted the event in question. Attention and enactment processes become the products of the industry's interpretation of the event. And as shown by the articles and editorials in *Chemical Week*, the industry's enactment of the events differed from outsiders' enactments as recorded in the general and financial press.

Attributions of Accountability and Examination of Image. Going beyond existing theories on public attention to events and issues (Hilgartner and Bosk 1988), our model identifies two mechanisms—outsiders' attributions of accountability and insiders' examination of industry image—as shaping the industry's *initial* public attention. In our model, the industry press serves as the conduit between outsiders' attributions and insiders' self-examination. We posit that industries are more likely to publicly attend to an event under two conditions: (a) when they are held publicly accountable for that event, thereby affecting the industry's reputation; or (b) industry insiders conduct a self-examination of how the event may affect their image. In both instances the industry's initial public attention is determined directly or indirectly by concerns with outsiders' views of the industry and its reputation. Outsiders' concerns with an industry's accountability make an event more salient and determine whether an event is publicly attended or not. For the case of outsiders' attributions of accountability these concerns reflect previously recorded assignments of the industry's credit or blame for the event, as in *Silent Spring* and the two Earth Days. But as shown by the *Exxon Valdez* spill and *The Limits to Growth*, the industry's concern with its external image may itself trigger public attention, even if outsiders do not directly make the industry accountable.

Social Structures of Attention. Our data and inferences show that objective measures of an external event are only partially important in the enactment of that incident. Structural factors (such as the rules of the game, the status of the players, and the implications for the core technology) shape industry enactments of external events and whether the industry becomes concerned with how the event affects its image. The existing institutional rules, norms, and beliefs are important determinants of the industry enactment process.

Contestation and Contradiction. Our model is consistent with prior research on events which highlights how event enactments are an unfolding process (Isabella 1990, Barr 1998). Although not the focus of our research, we observed that following initial public attention to an event, both outsiders and insiders had continuing enactments and reenactments of both the initial event and of the subsequent responses by the industry and external actors. In seeking to explain whether public attention is sustained within an industry and an event becomes a critical issue, our model examines the effect of the subsequent enacted responses to the event and its aftermath both by outsiders and insiders.

Our examination of event attention supports the view of social information processing as inherently political (Tetlock 1990, Ocasio 1997). Our model posits the importance of contestation (White 1992, Ocasio 1994) to explain whether and how some events were perceived to be of critical importance by the industry. Contestation (White 1992) refers to contests for control among disparate players and their identities (whether individual, group, organizational, or supraorganizational) that lead to competing perspectives of institutional reality and of the meaning of the event in question. Our model highlights the contested enactments between outsiders and insiders. This contest over what meaning to assign to the event results in an increased likelihood that an event will be understood as an issue of consequence to the industry and that public attention will be sustained over time. Industry constituents act like politicians (Tetlock 1990), either through a common voice such as a trade association or trade journal, or through high-status players, seeking to achieve and maintain the industry's identity. Event attentional processing becomes a contest over meaning among players both inside and outside the industry (Hannigan 1995). This discourse is highly subject to the politics of the participants involved, overlain by the dominant logics and rules of the game prevailing at the time. The level of contestation is representative of the cultural context in which it occurs (as reflected by the industry's identity) as much as it is driven by the political context.

The challenges to industry identity involve the search for new answers and the rejection of available responses. For example, if the industry can invoke existing routinized answers to the external challenge, then the external challenge can go unengaged and the event will not become an "issue" for the industry. But, if high levels of contradictions exist between the enactments of the events by outsiders and the prevailing industry identity, as in the cases of *Silent Spring* and Love Canal, then contestation among these competing interpretations will occur and the event will be understood as an important issue.

Our theory and evidence suggest that contradictions with an industry's identity are more critical than concerns with its external image in sustaining public attention. For example, the first Earth Day did not become a critical issue for the industry despite the continuing threat to the industry's external image. Earth Day could be more readily ignored because student activists were viewed as political actors uninformed by science, and the industry's

scientific identity was not directly threatened. The case of *Silent Spring*, however, highlights the contradictions between the industry's identity as a scientific enterprise in the pursuit of progress, and the continued critiques by prominent scientists of the health hazards of chemical manufacturing. Scientific critiques could not be readily responded to as political attacks, and this led to continued contestation over the meaning and findings of *Silent Spring*.

Event Reenactment. The influence of the institutional order alters how an event is enacted, not only at the time of its occurrence, but also how it can be "reenacted" after it has occurred. As industries and institutional arrangements evolve, events can be retroactively enacted to fit the new social structures. This could be offered as a third stage in our model, one that is disconnected from the progression we describe whereby events reemerge as social structures evolve. In this study, three events have become reenacted in this way—the Cuyahoga River fire, Earth Day, and *Silent Spring*. The Cuyahoga River fire has been re-enacted through the pronouncements of agency officials as a seminal event in environmental history (Opheim 1993, Browner 1994). Yet although the event evocatively highlights how much water quality has been improved in the thirty years since it occurred, the event failed to gain widespread notoriety in 1969 as representing an issue that must be dealt with in the national agenda. It was a local issue regarding a river fire, an event that was not without precedent on other waterways nationally.

The example of Earth Day shows how concerted attempts were made to reenact the event on a yearly basis, but with little success. Earth Day 1971 and 1972 were failures as a repeated holiday. The event was, however, well attended on its reenactment on its twenty-year anniversary in 1990. Yet such a reenactment must, by our explanation, reflect the institutional context of 1990 and not that of twenty years before. It was, in fact, enacted in such a way, leading many to feel that the spirit and meaning of the event had been altered dramatically. It was enacted in a new form and function that lacked the grass roots protest that defined it in 1970. Finally, the event of *Silent Spring* has been claimed by many as the beginning of the modern environmental movement (Gottlieb 1993, Scheffer 1991). However, such retroactive claims deny the reality that no such environmental movement existed until well after the book's release. Neither the chemical industry nor Rachel Carson would likely have referred to herself as an environmentalist. Aside from the fact that the term had no meaning in 1962, she was seen (and saw herself) as a scientist, collecting scientific data to make a scientific argument about the harmful side-effects of technological advancement. She did not argue against the use of pesticides, but rather for their responsible use (Brooks 1972). To mark the beginning of a movement with an event that preceded the formation of that movement by at least eight years—around the events of the passage of the National Environmental Policy Act, the first Earth Day (Evernden 1993), and the formation of the EPA (Hoffman 1997)—is historically and institutionally inaccurate.

Conclusions

This paper makes several contributions to our understanding of industry events and their enactment. We have developed a theoretical model of industry attention to events that draws connections between the social and structural factors affecting the industry and the level of attention to events. While many have considered the role of events at the level of the individual (Weick 1979) or the organization (Meyer 1982, Dutton and Dukerich 1991), a primary contribution of this paper is to consider attention to an event at the level of the industrial sector. And while others have considered the role of events in organizational change processes (Meyer 1982, Meyer et al. 1990), what has been lacking is a model for discerning why these processes are engaged for some events while not for others. In combining our industry-level analysis with the model of event attention, this paper contributes to theory by drawing critical linkages among several important literatures.

We have applied the concepts of accountability (Tetlock 1990) and contestation (White 1992) to the industry level, using them to explain how industries attend to events. In this attentional process, image and identity become dominant considerations in the process by which industries pay attention to events. Competing attributions of accountability can challenge the industry's identity, creating both contestation among diverse players and competing enactments of the event. Alternatively, an internal examination of an industry's image may also trigger initial attention. Our model posits, however, that sustained levels of public attention require contestation between insiders and outsiders over the enactment of the event.[2] The introduction of the concept of contestation can have broad implications across many levels of analysis, including institutional formation and institutional change as well as the integration of political processes and individual agency into institutional processes.

This paper also makes several contributions to the literature on attention (March and Olsen 1976, Dutton 1988, Ocasio 1997). First, it extends the study of organizational

attention to the industry level. Second, it provides an empirical examination of industry attention and inattention by examining one important communication channel within the industry, the business press. Third, it develops a model of attention that links industry identity with political contestation over the industry's image and identity. Finally, the paper suggests that the search for accountability is a key factor in determining attention to events.

Finally, this paper suggests that institutional arrangements play a prominent role in the initial attention to external events. Other research suggests that external events play a prominent role in the development and alteration of institutional arrangements (Hoffman 1997, 1999). Combining both research ideas, the process becomes recursive. Social structure is both the medium and the outcome of the events that transpire (Giddens 1979). One result in conducting this particular study has been to understand the former aspect of this institution-event relationship. While this model has been developed to explain environmental events in the industry of U.S. chemical production, future research may test the model, the resulting hypotheses, and their applicability to other fields, to other types of events, and at other levels of analysis.

Our interest in this study is to understand how external events are attended to within the industrial sector. Our objective in future work is to understand how these events, once attended to, can alter institutional arrangements. There are few theories about changes within institutions, and one hypothesis we hope to pursue is whether industry attention to events is a necessary condition for institutional change. Before this hypothesis can be pursued, however, the process by which external events enter the institutional environment must first be explained. That is one goal of this paper, to provide a template for this explanation. Attentional processes define events in terms of the interests and identities of the industrial sector as it exists within an institutional context. Competing interests engage in contestation over competing attributions of accountability and events. This form of institutional contest, we hypothesize, forms the foundation by which institutional shifts can occur. In our future work, we will expand upon this hypothesis and elaborate further on industry evolution and institutional change process.

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Endnotes

[1]Traditionally, theory-testing methods (using primarily quantitative data) are seen to rely on deduction while theory generation (using primarily qualitative data) is linked to induction. In reality most, if not all, research, whether qualitative or quantitative, involves both induction and deduction. We follow Miles and Huberman (1984, p. 14) by beginning with an explicit theoretical framework. Like theirs, our approach is more deductive than most other studies that employ cross-comparison of cases. We also follow Miles and Huberman by including, as part of our analytical approach, verification that the evidence supports our hypotheses. Despite the inclusion of data verification in our analysis, our exercise is one of theory development rather than theory testing, because our theoretical model and hypotheses emerged from the data. Explicit testing of our emergent theory and hypotheses must be conducted with new data as part of future research.

[2]As noticed by an anonymous reviewer, most of the events in our study, with the exception of Earth Day 1990 and possibly the cleanup of the *Exxon Valdez*, were potentially negative for the industry. As suggested by the literature on opportunities and threats (Dutton and Jackson 1987) positive events are more likely to be enacted as opportunities and are less likely to lead to sustained attention. However, further research with a greater sample of positive events is required to determine whether contested enactments are also a precondition for sustained attention for positive events.

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