Regulating External Threats in the Cigarette Industry

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The paper applies theoretical ideas about how threatened systems regulate external disturbances in an organizational context. The pattern of events in the controversy surrounding smoking and health was examined over a thirty-year period to determine whether the cigarette industry effectively regulated environmental disturbances to protect itself from potential threats. Both the extended theory and the empirical analysis demonstrate that the presence of third-party actors and the positions they take are critical in determining the outcomes of controversy.•

When organizations are publicly accused of wrongdoing, they usually attempt to justify themselves. If governmental agencies then announce hearings to investigate the alleged wrongdoing, the original accusation becomes a serious threat. The threatened organizations usually continue to maintain defensive postures (Post and Mahon, 1980), because governmentally imposed changes alter established products, limit technologies, or restrict distribution processes. As both governmental agencies and threatened organizations invest more resources to advocate or defend their respective positions, the stakes become higher (MacAvoy, 1979) and disputes become more focused. Then new issues arise as struggles evolve (Anderson, 1983). Organizations faced with ongoing controversy and potential losses from accusations of wrongdoing attempt to manage, regulate, and reduce the damage.

THEORETICAL BACKGROUND

Ashby (1956: 219), taking a cybernetic perspective, discussed how threatened organizations could increase protection by supplementing naturally shielding systems with regulatory mechanisms designed to respond to the disruptive effects of disturbances and minimize them. He noted, however, that protection was not guaranteed when disturbances were beyond the scope of such regulatory mechanisms. Furthermore, when the threatening environment was very large and complex, it might be impossible to regulate disturbances. In such cases, Ashby (1956: 246) mentioned that the scope and power of the regulatory mechanism might be increased, but he did not consider how this might be done.

This paper assumes that organizations facing external threats want to protect crucial operating units from disturbance (Thompson, 1967). The systems surrounding the crucial operating units are defined, their functions distinguished, and Ashby's (1956: 195–218) methods for structurally embedding a regulator in these systems are described. The paper extends Ashby's work to include coping with an overload of environmental disturbances by describing how the scope and power of the regulator may be increased. Then, a preferred outcome pattern for ongoing events is deduced. Insofar as this pattern occurs in practice, it indicates that a regulator has successfully reduced the effects of the disturbance on crucial operating units.

To illustrate how such a regulatory process may operate in an organizational setting, the events reported in the controversy surrounding cigarette smoking and health were analyzed. This is an example in which governmental agencies intervened and

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constrained the activities of organizations in the cigarette industry because of accumulated evidence showing that cigarette smoking is associated with sickness and death (Blum, 1983). The study focuses on the intraindustry responses that organizations in the industry used to protect themselves from threats to their cigarette operations.

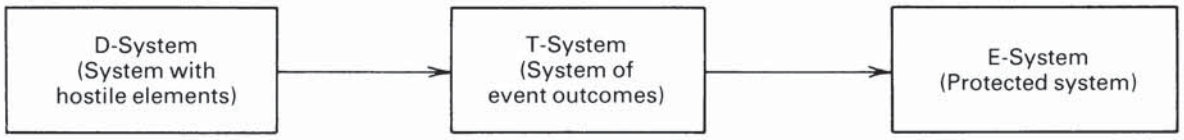
Like the extensive study of the cigarette industry reported by Miles and Cameron (1982), the present study is longitudinal and is concerned with the adaptation of organizations. However, Miles and Cameron (1982: 26) "established quite broad boundaries around the variety of organizational adaptations that [they] were willing to consider, but confined the analysis to only those 'critical' events and decisions that establish or reshape the fundamental purposes of organizations and the persistence they enjoy." Thus, Miles and Cameron (1982: 200) were interested in analyzing how cigarette companies defended "their traditional domain against a legitimacy threat from its [sic] institutional environment," how "they engaged in an intense competitive battle for market share within the threatened environment," and how "each company attempted to create new domains of opportunity and to minimize risk exposure through overseas expansion and domestic diversification." They described critical overall industry reorientations and assessed the effectiveness of the various individual responses chosen by different cigarette companies to align themselves with these new industry trends.

The present study adopts a narrower perspective and focuses on how the cigarette industry has protected its threatened cigarette operations, i.e., on domain defense (Miles and Cameron, 1982). The study ignores the competitive battles for market share within the cigarette industry and companies' attempts to diversify into new domains. Instead, the aim is to discern whether the underlying patterns implicit in events in the controversy indicate that an Ashby-type regulatory process may have been operating. The present study complements that of Miles and Cameron (1982), who focused primarily on industry reorientations, by providing more insights into the management of ongoing events designed to protect cigarette-related activities as these were threatened by developments in the external environment.

System Interrelationships and Regulation

Ashby (1956: 219) distinguished three interrelated systems (Figure 1) to define the problem that a regulator should solve. A protected system, the E-system, has essential characteristics that are to be maintained within predetermined ranges. The problem consists of an independent D-system containing hostile elements that threaten to disturb the E-system. The intervening T-system is a dynamic system of event outcomes. Potential disturbances generated in the D-system must be transmitted into event outcomes in the T-system to affect the E-system. If a threatened organization can somehow arrange to influence or manage the event outcomes in the T-system, then the T-system may be turned into an intervening shield, which blocks the direct transmission of disturbances from the system of hostile elements (the D-system) to the protected system (the E-system).

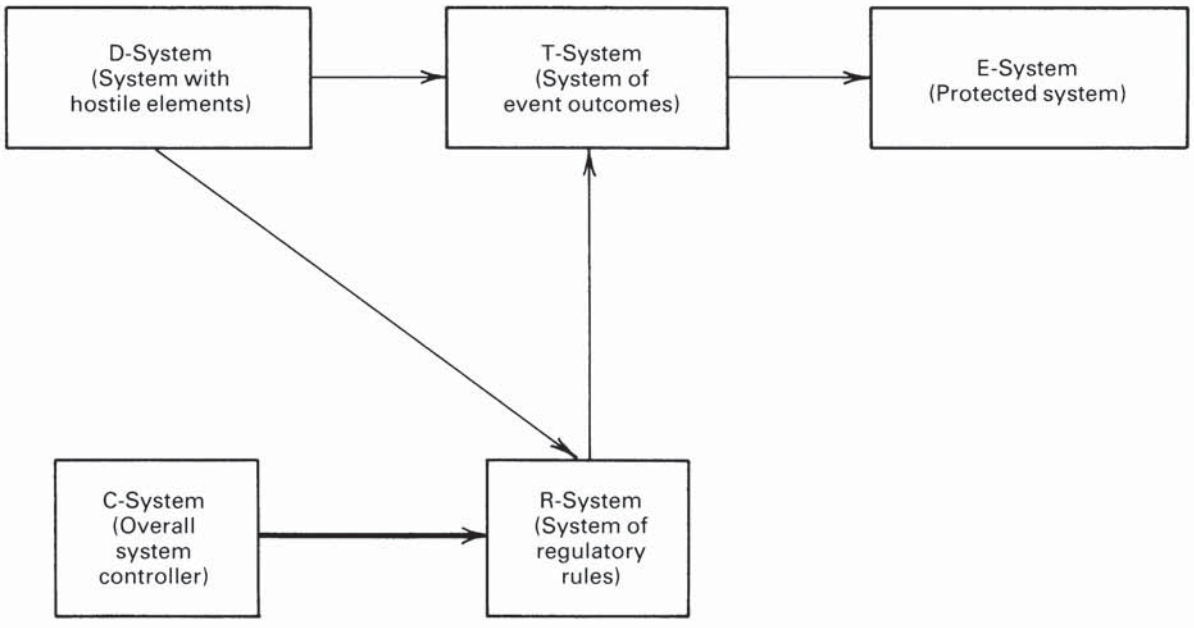
Figure 1. Systems defining the regulatory problem. (Adapted from W. Ross Ashby, *An Introduction to Cybernetics,* p. 219. © 1956 by John Wiley & Sons, Inc.)



The regulatory problem is to find ways to manage the event outcomes in the T-system. Ashby's (1956: 214) general model for managing T-system event outcomes is shown in Figure 2, in which the R-system is a regulatory system. It functions mechanistically as a closed transformation consisting of a set of rules for selectively responding to disturbances in the D-system in such a way as to eliminate disruptive effects to the E-system. Ideally, disturbances in the D-system that are not directly damaging to the E-system are simply allowed to become event outcomes in the T-system; however, disturbances in the D-system recognized as dangerous by the R-system are transformed so that the resulting T-system event outcomes are harmless to the E-system. Ashby (1956: 206) emphasized that R-system regulatory effectiveness is subject to requisite-variety constraints. Thus, a preprogrammed R-system that cannot recognize some D-system disturbances as dangerous to the E-system may make no attempt to transform them. As a result, D-system disturbances may get through to affect the E-system, and the regulatory system will have failed.

Ashby's model (1956: 213–214) introduces an independent, overall system controller, the C-system, a managerial unit responsible for E-system performance. The C-system determines the set of preferred T-system event outcomes, which the R-system is supposed to achieve through monitoring D-system disturbances and then implementing automatic responses to them.

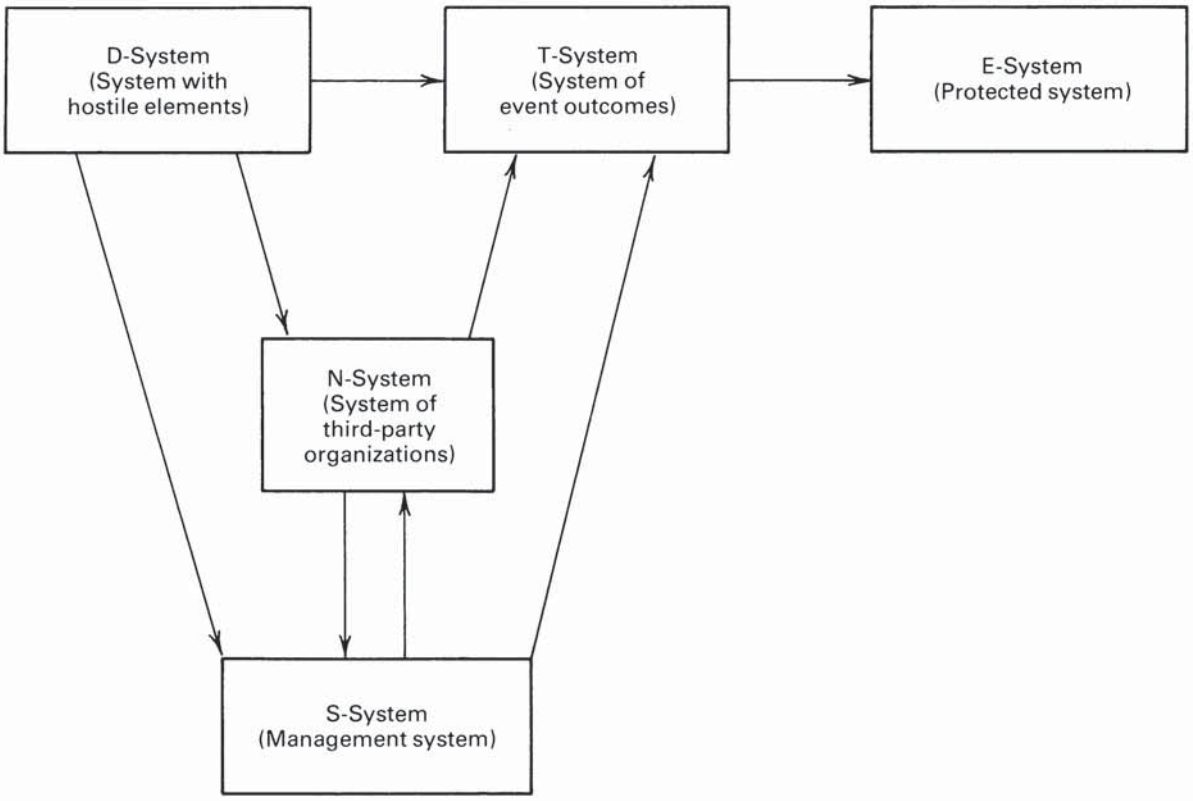
Figure 2. Interrelated systems and an embedded regulator for protecting an organization from disturbance. (Adapted from W. Ross Ashby, *An Introduction to Cybernetics,* p. 214. © 1956 by John Wiley & Sons, Inc.)



If the R-system does not contain the requisite variety to match the requisite variety in the disturbing D-system, its regulatory capacities are inadequate. Ideally, in an organizational context, this would be communicated to the managing C-system, and C-system controllers would then decide how to respond. However, as indicated in Figure 2, Ashby's R-system operates as an automatic, closed-system transformation process. Two problems then result: regulatory inadequacy is not communicated from the R-system to the C-system, and the R-system cannot itself obtain the additional requisite variety to match disturbances from the D-system.

As shown in Figure 3, two complementary system redefinitions avoid these problems. First, instead of the R-system being an automatic regulatory mechanism, the C-system and the R-system may be combined into an independent S-system, which manages activities designed to support and protect the E-system. The S-system then performs both decision-making and D-system transformation functions. Second, a new system is introduced, the N-system, made up of third-party organizations. This is an unlimited set of organizations. Thus, the N-system opens up possibilities for the unlimited augmentation of S-system support activities. It also allows the regulatory process to function as an open rather than a closed system. Specifically, as third-party organizations share mutual interests with the threatened E-system, they may be persuaded to help protect the threatened E-system. The requisite variety in the S-system needed to protect the E-system from D-system disturbances is thus increased.

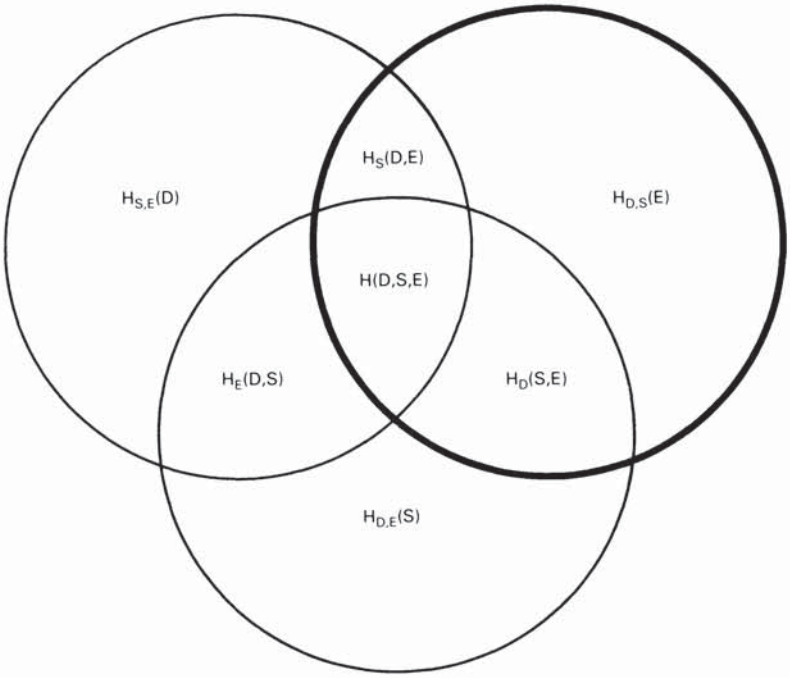
Figure 3. Interrelated systems with capacities to adjust to overload in order to protect an organization from disturbance.



The N-system of third-party organizations may also include members that share interests with members of the threatening D-system. D-system organizations may seek help for their positions in the controversy, just as the S-system seeks support for its views. Thus, the S-system must monitor the N-system, as well as transforming D-system activities directly so that they are no longer threatening to the E-system. The S-system may also influence third-party organizations to take actions that negate the effects of potential disturbances.

All the figures show that the event outcomes that may have potential effects on the E-system occur in the T-system. Cook et al. (1983) argued that managers, in organizing a defense, should distinguish between possible event outcomes and clarify their preferences. Ideally, event outcomes in the T-system involving the E-system will either be internally initiated operating adjustments or augmentations of S-system support capacities. Also, ideally, potentially threatening activity will be kept away from the E-system and should be isolated in the D-system. However, as ongoing events may involve several organizational actors and activities, the pattern in T-system event outcomes is unlikely to correspond to this ideal. Rather, event outcomes will include various conjunctions reflecting the participation of the different systems. These different conjunction possibilities are shown in Figure 4, where S, D, and E represent the three systems, and H is an indication of the equivocal consequences that may be associated with an event outcome reflecting combinations of systems. For example,

Figure 4. T-system event outcomes, showing the possible combinations of event outcomes resulting from efforts to shield a protected system (the E-system) from disturbances.



Note: The letters within brackets indicate systems contributing to an event outcome. Subscript letters show systems not involved in an event. Event outcomes involving the protected system, which should be avoided, are highlighted by being placed within a darkened circle.

H(E) represents the equivocal consequences associated with event outcomes involving the E-system. In general, these equivocal consequences may be interpreted as information, uncertainty, or potential disturbance. In the case of the protected E-system, H(E) is interpreted as potential disturbance. The letters appearing within the parentheses indicate which of the three systems are involved in an event; subscript letters indicate the systems that were not involved in the event but that could have been.

From Figure 4, the following definitional relations among the sources of disturbance then hold:

$$H(E) = H_{D,S}(E) + H_D(S,E) + H_S(D,E) + H(D,S,E) \quad (1)$$

$$H(D) = H_{S,E}(D) + H_E(D,S) + H_S(D,E) + H(D,S,E) \quad (2)$$

$$H(S) = H_{D,E}(S) + H_E(D,S) + H_D(S,E) + H(D,S,E) \quad (3)$$

Subtracting equation (2) from equation (1) gives:

$$H(E) = H_{D,S}(E) + H(D) + H_D(S,E) - H_{S,E}(D) - H_E(D,S) \quad (4)$$

Subtracting equation (3) from equation (1) gives:

$$H(E) = H_{D,S}(E) + H(S) + H_S(D,E) - H_{D,E}(S) - H_E(D,S) \quad (5)$$

As Figure 4 shows, activities may occur in seven different conjunctions among the three systems. However, to the extent that activities in those conjunctions contribute to a decrease in H(E) and outweigh those that contribute to an increase in H(E), the result will be a net decrease in H(E), as is shown by equations (1), (4), and (5). However, the goal of the overall system is to minimize disturbance [H(E)] to the E-system.

For example, based on equation (1), to decrease H(E) in the face of threats coming from H(D), S-system managers should prefer T-system outcomes that minimize the relative frequency with which the activities occur in $H_{D,S}(E)$, $H_D(S,E)$, $H_S(D,E)$, and H(D,S,E). Based on equations (4) and (5), they should prefer that general activity levels in H(D) and H(S) also be minimized; however, they cannot control H(D), which is independent. If H(D) increases, then based on equations (4) and (5), they should prefer T-system outcomes to take place in $H_{S,E}(D)$ and $H_E(D,S)$, or in $H_{D,E}(S)$ in order for H(E) to be minimized. This means that events involving the D-system can have more or less disturbance potential as far as the E-system is concerned. Even though D-system activities are always potentially threatening, to the extent that a larger proportion of D-system events can be isolated in $H_{S,E}(D)$ or $H_E(D,S)$, this will actually reduce the proportion of total system disturbance affecting H(E). However, as the proportion of D-system events in the conjunctions $H_S(D,E)$ and H(D,S,E) increases, there are directly disturbing consequences for the E-system.

To match changes in H(D), managers adjust S-system capacities, H(S). As suggested by Sahal (1978), the potential behavioral variety in the S-system is probably related to the number of actors whose actions contribute to the S-system; thus,

$$H(S) = \sum_{i=1}^{n} H(X_i) - H(X_1 : , \ldots , : X_n) \quad (6)$$

where the X_i are the actors whose activities contribute to the variety of behavior in H(S). $H(X_i)$ represents the variety of activities involving each independent actor, and $H(X_1 : , \ldots , :$

X_n) represents the variety of activities reflecting actors' joint action. H(S) should increase as the H(X_i) increases; it will also increase as H(X_1 : , . . . , : X_n) approaches zero. Thus, S-system variety is maximized as the number of actors who act independently and supportively increases.

To increase H(S) temporarily, controllers should draw in more potential sources of activities, X_i, from the N-system, made up of third-party organizations. These third-party organizations should become independently active and supportive, so that their activities become a part of the S-system. However, increases in H(S) may lead to increases in H_D(S,E), which results in undesirable increases in H(E); therefore, to match threatening disturbance in the D-system, S-system managers should not attempt to persuade more third-party organizations to act in supportive ways than are needed, for fear of inadvertently disturbing the E-system. Furthermore, when the threat potential in the D-system declines, the matching potential in the S-system should also be decreased, by abandoning efforts to draw in active participants from the N-system of third-party organizations and allowing existing relationships to decline. In this way, total S-system capacities can be balanced and matched against the threat potential coming from the D-system. They can also be managed and adjusted over time.

This perspective on supportive coalition formation differs from that in the political science literature. As described by Pfeffer (1981: 154–155), the political science approach to coalition formation centers around the notion of winning, whether it be through voting blocs in legislatures or coalition formation in small experimental groups. However, whereas winning implies the desirability of unlimited increases in S-system capacity, the present emphasis is on maintaining a preferred balance that is just enough to manage potential threats.

The pattern in T-system event outcomes that is to be desired and that would indicate successful regulation is a pattern in which H(E), the proportion of events involving the E-system, continually declines. No outcomes should involve the combination events H(D,S,E) or H_S(D,E). On balance, any events in H_D(S,E) should add more to S-system support capacity than they cost through E-system disturbances. Further, as an effective S-system is established, the proportion of such preventive measures should decrease. $H_{D,S}$(E) should also be low, because the aim is to limit operating system changes. Successful regulation of disturbance will concentrate proportionally more events in the isolated D-system, i.e., $H_{S,E}$(D). The proportion of activity involving the S-system is expected to fluctuate in direct response to the proportion of directly threatening activity from the D-system. This preferred emphasis in outcome activity is noted in Tables 1 and 2, below.

CIGARETTE-SMOKING-AND-HEALTH CONTROVERSY

A combined chronology was compiled of significant events in the controversy surrounding cigarette smoking and health for the period 1950–1980, based on the sources listed in Appendix A. Because reported events are only a small sample of the activities that characterize a controversy, a question arises as to whether this sampling is representative. Published sources usually include the most newsworthy events involving promi-

nent institutions or persons, higher stakes, crucial court rulings, and publically reported critical decisions; however, it may miss more covert but no less critical activities. For example, the sources used contained no mention of reports by Warner (1985) that some magazines such as *Time* and *Newsweek,* which include extensive cigarette advertising, have resisted and censored attempts to discuss the hazards of smoking in health supplements they have published. Therefore, an analysis that discloses a pattern indicating successful regulation of external disturbances would probably underestimate the actual level of protective activity, because covert support was not covered in the sources.

The chronology included 486 separate reported events involving 589 different actors. It was divided into four periods, based on the issues around which the controversy was centered during that particular period (Engwall, 1973; Miles and Cameron, 1982). A brief description of these periods follows.

Period 1: Prelude to Controversy, 1950–1961. Medical studies had consistently found associations between cigarette smoking and illness. After the media drew attention to medical studies linking smoking to disease in 1954, concerns were raised in the government and among health authorities, as well as among cigarette manufacturers, about these findings.

Period 2: Controversy over the Surgeon General's Report, 1962–1965. The surgeon general's report (*Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service*) was published in January 1964. As a result, various hearings were held before regulatory agencies and Congress and culminated in legislation requiring a warning label on all cigarette packages.

Period 3: Controversy over Broadcast Advertising, 1966–1970. As a result of a fairness-doctrine complaint filed with the Federal Communications Commission (FCC) in January 1967, questions were raised as to whether the broadcast media should be required to inform the public about the health hazards of cigarette smoking. Legislation was passed in 1970 prohibiting cigarette advertising on the broadcast media after January 1, 1971.

Period 4: Localized Controversies, 1971–1980. Increasing numbers of state and local authorities passed restrictions on cigarette smoking, prohibiting it, for example, on public transportation and in many public buildings.

The chronology of events represents the T-system event outcomes. Before the events could be classified, it was necessary to define the various systems. The E-system was defined to include organizations and activities primarily involved in cigarette production, distribution, promotion, and sales, for example, the cigarette-related activity of Philip Morris. The D-system included organizations and activities seeking to limit cigarette production, distribution, promotion, or sales, for example, the surgeon general when discussing cigarettes. The S-system included organizations and activities that consistently supported and protected cigarette production, distribution, promotion, and sales from disturbance, for instance, the Tobacco Institute. The N-system included organizations and activities not primarily concerned with cigarette production,

distribution, promotion, or sales, but which had some mutuality of interests with E-system or D-system organizations. Based on these shared interests, therefore, third-party organizations, such as newspapers or broadcasting networks, might be persuaded to take positions that blocked or encouraged disturbances to the E-system.

The reported event outcomes in the chronology included the actions taken and the organizational actors taking the actions. Thus, each event had to be classified twice, by the action and the actors, because there was no necessary correspondence between the position of an actor and the action taken. For example, at congressional hearings, representatives of the medical profession testified on both sides of the controversy.

The coding procedure used is described in Appendix B. For each period, first, the actions in each event were identified and coded; then the actor or actors involved in each event were identified and coded. Each action and actor was separately identified as belonging to one of the four systems. The two categorizations were then combined to classify each event. If the categorization of either an action or an actor indicated that one of the systems was present, then this presence was recorded in the overall classification of the event. In this way, all events were classified into one of the seven categories shown in Figure 4.

In identifying actions in the chronology, interrater agreement over the four periods ranged from 80.6 to 97.5 percent (Landfield, 1971: 53). In coding actions as being elements of one of the four systems, D, N, S, and E (Table 1), interrater agreement ranged from 85.2 to 96.7 percent. For identifying actors, interrater agreement ranged from 79.8 to 95.6 percent. For coding actors as being members of one of the four systems, interrater agreement ranged from 88.0 to 97.9 percent. Interrater agreement is discussed in more detail in Appendix C.

Table 1 shows how events defining developments in the smoking-and-health controversy have been relatively concentrated in the major systems. Because event outcomes can be classified as involving more than one system (Figure 4), the

Table 1

Percentage of Event Outcomes Reflecting the E-system, the S-system and the D-system, and Percentage of Actions and Actors Classified in the E-system, S-system, D-system, and N-system during Four Periods of Controversy

	Period							
	1950–1961		1962–1965		1966–1970		1971–1980	
E-system*	48.1		20.0		12.6		5.1	
S-system	25.9		36.9		25.9		22.7	
D-system	70.4		56.9		72.6		77.4	
E-system†	2.0	26.9	2.1	15.1	0.7	11.0	0.0	4.3
S-system	14.0	7.7	40.8	11.1	19.2	11.0	18.5	6.5
D-system	74.0	3.9	39.8	7.1	71.9	27.4	72.3	34.4
N-system	10.0	61.5	17.3	66.7	8.2	50.6	9.2	54.8

*Preferred T-system event outcomes: E-system decreases; S-system fluctuates; D-system is independent.
†Left column represents actions; right column, actors.

totals add to more than 100 percent. Table 1 also shows how the proportions of actions and actors representing the different systems changed over the four periods. Table 2 shows the T-system event outcomes over the four periods, along with the preferred pattern of emphasis if a regulatory mechanism were operating effectively.

Table 1 shows that the E-system was initially involved in more events proportionately, but over time this proportion declined steadily. The proportion of events involving the S-system first increased, presumably to reduce events involving the E-system, and then decreased slightly. Throughout the smoking-and-health controversy, events were always concentrated in the D-system. The dramatic reduction in E-system activity suggests that the cigarette industry successfully established an effective regulatory process.

Table 1 shows that actions involving the E-system have been kept consistently minimal. Furthermore, except for the 1962–1965 period, which involved extensive discussions about appropriate responses to the 1964 surgeon general's report, actions were concentrated in the D-system. S-system actions were most evident in the second period and continued to be maintained at relatively high levels.

Table 2

Percentage of Classified Coded Event Outcomes (T-System) in the Smoking-and-Health Controversy during Four Periods, with Preferred T-System Event Outcomes

Coding categories for event outcomes	Period 1950–1961	1962–1965	1966–1970	1971–1980	Preferred T-system event outcomes
$H_{S,E}(D)$	48.2	44.6	61.7	67.9	increasing
$H_{D,E}(S)$	0	20.0	16.7	11.7	fluctuating
$H_{E}(D,S)$	0	7.7	5.0	7.7	fluctuating
$H_{D}(S,E)$	18.5	7.7	2.5	3.3	decreasing
H(D,S,E)	7.4	1.5	1.7	0	decreasing
$H_{S}(D,E)$	14.8	3.1	4.2	1.8	decreasing
$H_{D,S}(E)$	7.4	7.7	4.2	0	minimal
$H_{D,S,E}(N)$	3.7	7.7	4.0	7.6	not relevant
Total percentage	100.0	100.0	100.0	100.0	
Total number reported event outcomes	27	65	120	274	

Table 1 also shows that throughout the controversy, the dominating group of actors were members of the third-party N-system. Over the four periods, the participation of E-system actors steadily declined, even as the participation of D-system actors steadily increased. S-system actor participation fluctuated, depending on the need to manage a more coordinated and unified defense process. During the periods leading up to the congressional hearings in 1964 and 1969, the participation of S-system actors was at its highest.

Table 2 shows, in detail, the pattern in T-system event outcomes over the four periods in the separate coding categories shown in Figure 4. As the controversy developed, proportionally more events were concentrated in the isolated D-system, $H_{S,E}(D)$, thus posing only an indirect threat to the cigarette

industry. In the 1950–1961 period, the pattern in reported events suggests that the cigarette industry had actively established the structure for a protective defense system, as indicated by greater activity in $H_D(S,E)$. This was in response to the relatively large number of disturbances actually requiring changes in the E-system, i.e., H(D,S,E) and $H_S(D,E)$, during this period. Over the four periods, however, $H_D(S,E)$, H(D,S,E), and $H_S(D,E)$ all declined, suggesting that an effective regulatory process had been established and was then able to reduce disturbances to the E-system.

The number of all reported events coded for each period consistently increased over the four periods (Table 2), indicating that more attention was being attracted to the general issue, resulting in more uncertainty and potential threat to the cigarette industry. However, the actual numbers of event outcomes are less important than the balance in their relative frequencies. Tables 1 and 2 show that, over the four periods, the balance in relative frequencies of the T-system event outcomes moved consistently in directions that reduced disturbance to the E-system.

CHRONOLOGY AND DISCUSSION

Period 1: Prelude to Controversy, 1950–1961

The period prior to 1962 was a prelude to the controversy. Table 2 shows that 48 percent of the threatening event outcomes had no direct effect on cigarette-industry operations. However, large liability suits were brought against cigarette firms by the families of alleged victims of cigarette smoking. Court decisions were eventually made in favor of the cigarette firms, after lawyers argued successfully that the causal connection between the victims' smoking and death from cancer had not been proven. This is reflected in the event outcomes (7.4 percent) reported as involving all the systems, i.e., H(D,S,E).

During this early period, the industry had less success in arguing its case before the Federal Trade Commission (FTC). Controversy had arisen because of advertising claims that filtered cigarettes reduced tar and nicotine intake, which the FTC construed as a health claim. The FTC forbade cigarette firms from making such claims and forced numerous adjustments in industry advertising practices. This is reflected in the directly disturbing event outcomes (14.8 percent) scored in $H_S(D,E)$.

The FTC's regulations directly affected business practices, and the dangers implicit in large liability suits being brought before the courts were worrisome to the cigarette industry. In response, a skeletal basis for a formal industry-wide S-system was laid by establishing separate organizations including the Tobacco Research Council and the Tobacco Institute (in 1958) to defend the cigarette industry against future disturbances. The event outcomes (18.5 percent) in $H_D(S,E)$ reflect these efforts. Both organizations were expected to interface with groups critical of the cigarette industry, to monitor developments, to coordinate and present unified cigarette-industry positions, and hence to ward off potential dangers.

Period 2: Controversy over the Surgeon General's Report, 1962–1965

The cigarette industry correctly anticipated that the findings in the surgeon general's report (U.S. Department of Health, Education and Welfare, 1964) would be damaging. After the publication of the report, legislation was proposed to provide new support to the FTC in setting standards for cigarette advertising and labeling. The FTC announced hearings on new rule-making procedures and then established more rigorous labeling standards. Other proposals surfaced in Congress that were aimed at educating the public as to the hazards of cigarette smoking. Such potential disturbances in $H_{S,E}(D)$ made up approximately 45 percent of the event outcomes reported during this period.

During this period, S-system capacity was increased, as third-party actors adopted positions favorable to the cigarette industry, as shown by reported event outcomes (20 percent) in $H_{D,E}(S)$. For example, before the 1964 surgeon general's report on smoking and health was issued, the American Medical Association (AMA) had argued against health warnings on cigarette packages and suggested that more research should be attempted to find the elements in cigarettes that caused disease. The Tobacco Research Institute awarded the AMA $10,000,000 for such studies. In Congress, representatives from tobacco states introduced bills designed to delay and prevent FTC regulation of the cigarette industry. Business associations representing advertising agencies, newspaper publishers, and broadcasters all made statements supporting the cigarette industry.

The $H_D(S,E)$ system made up about 8 percent of reported ongoing event outcomes as cigarette-industry members continued to take initiatives to establish and extend the S-system. For example, in an attempt to preempt external regulation, the cigarette industry voluntarily established a Cigarette Advertising Code, which required cigarette firms to stop implying that smoking and health were positively associated and to remove cigarette advertising from college publications and children's television programs. The cigarette industry also hired Abe Fortas to form a committee of lawyers to prepare and guide industry responses to any damaging findings in the 1964 surgeon general's report on smoking and health.

Congressional hearings involving all the parties to the controversy were eventually organized in 1964 and 1965 to discuss the various issues and consider possible actions. The event outcomes associated with the hearings were classified as involving all three systems, i.e., H(D,S,E), and made up 1.5 percent of the reported event outcomes during the period. Industry-sponsored witnesses discussed all aspects of the proposed measures, along with the proper role of Congress and governmental agencies in the regulatory processes. The discussion continued inside and outside Congress, culminating in confrontations between opponents such as the FTC, which was a representative part of the D-system, and supporters such as the American Newspaper Publishers' Association, which was a representative part of the cigarette industry's protective S-system. Industry representatives emphasized how important tobacco was to the U.S. economy, that medical

opinion about cigarettes was divided, and that since the industry could regulate itself, governmental regulation was not needed. They broadened the issue, emphasizing that the controversy included not only health concerns but also questions as to which government agencies had legitimate authority to regulate the industry. It was intimated that a weak health warning on cigarette packages might be acceptable because cigarette-industry representatives believed a warning might provide protection from future liability suits. $H_E(D,S)$ made up approximately 8 percent of the reported event outcomes during this period.

As a result of the congressional hearings, a uniform, weak warning was required to appear on all cigarette packages. Although approximately 3 percent of the reported events in the period were classified in $H_S(D,E)$, many of these potential disturbances were FTC rulings that would have affected the industry but were in fact eventually nullified through legislation passed in July 1965 that forbade the FTC or any other legislative bodies in the U.S. from making regulations for the cigarette industry for three years, until 1969. Implementation of the new advertising and labeling rules promulgated by the FTC, which had first been delayed, was made irrelevant by this legislation.

Period 3: Controversy over Broadcast Advertising, 1966–1970

During this period, reported events in the D-system increased. For example, the Public Health Service (PHS) created a Clearing House for Smoking and Health to collect and disseminate information and to coordinate governmental antismoking efforts. More health organizations took active stands against smoking. The National Advisory Cancer Council, for instance, blamed cigarette smoking for an epidemic of lung cancer. In 1967, a PHS study identified tar and nicotine as critical destructive elements in cigarettes and reported that as the tar and nicotine content increased, the risk of disease also increased. New governmental reports documented new links between cigarette smoking and disease, including evidence of the damage to unborn babies of mothers who smoke. Newly appointed Advisory Task Forces on Smoking and Health concluded that cigarette advertising promoted disease and caused death.

Although its rule-making authority had been temporarily revoked, the FTC continued to monitor cigarette advertising and the public's smoking habits and to make regular reports of its findings to Congress. The FTC also established a laboratory to test the tar and nicotine content of major cigarette brands and reported that firms were able to adjust the tar and nicotine content of cigarettes. Because the weak warning label had virtually no effect on smoking behavior, the FTC recommended that a stronger warning label be placed on cigarette packages and that their tar and nicotine content should be listed on all labels and in all advertisements.

In January 1967, a lawyer named John Banzhaf filed a fairness-doctrine complaint with the FCC, in which he claimed that broadcasters carrying cigarette commercials should also be required to inform listeners of the health hazards associated with cigarette smoking. Despite court challenges by broad-

casters and cigarette manufacturers, the ruling favoring Banzhaf was upheld and elaborated upon. In 1968, Banzhaf established the organization, Action on Smoking and Health (ASH). ASH filed complaints with the FTC charging the Tobacco Institute and tobacco firms with unfair and deceptive trade practices. The FTC investigation and report to Congress that followed disclosed that supposedly impartial pro-smoking magazine articles were actually written by the Tobacco Institute's public relations firm. The FTC recommended that deceptive trade practices should cease and that cigarette advertising be banned from radio and television. The FCC endorsed this recommendation. ASH also filed petitions with the Federal Aviation Administration (FAA) to require separate nonsmoking sections in passenger aircraft. The proportion of potential environmental disturbances in $H_{S,E}(D)$ during this period was approximately 62 percent of all reported event outcomes.

The Tobacco Institute responded to the governmental reports issued by the surgeon general and the PHS. The institute said the reports were inaccurate, misleading, and biased, that there was no scientifically established relationship between tar and nicotine levels and health, and that the FTC's techniques for measuring tar and nicotine content were defective. The institute launched an advertising campaign challenging the charges being made about cigarette smoking. In Congress, representatives from tobacco states presented action on proposals directed against the cigarette industry. At House hearings, witnesses supported by the cigarette and broadcast industries questioned the medical evidence that cigarettes were harmful, stressed that an adequate self-policing code was in place to ensure that advertising was designed to convince current smokers to change brands and not to increase demand, and that Congress alone had the right to regulate the industry. As a result, a House bill, which was passed and sent to the Senate, ignored the broadcasting issue, banned FTC or FCC regulation for another six years, and strengthened the warning label on cigarette packages. Approximately 26 percent of all reported event outcomes during this period involved the S-system, including approximately 17 percent in $H_{D,E}(S)$ and 5 percent in $H_E(D,S)$.

Only 2.5 percent of the reported event outcomes were classified in $H_D(S,E)$, indicating that there were relatively few new initiatives by the industry to extend the S-system. Not all cigarette firms continued to accept the voluntary advertising code, and although industry officials volunteered to tighten the code in 1967, a witness testifying before the House hearings in 1969 admitted that, due to pressures from both cigarette and broadcasting firms, there was in fact little enforcement of code guidelines.

Although cigarette industry officials were pleased with the bill passed by the House, they felt they could not convince the Senate to pass it. They knew that the FTC had proposed to the Senate Commerce Committee a temporary suspension of stronger labeling requirements if broadcast advertising was stopped. The industry decided to compromise and gradually withdraw its advertising from radio and television in exchange for legislation protecting their other advertising from the FTC's stronger labeling warnings. In response, the broadcasters withdrew their support of cigarette-industry positions, thus

significantly reducing the cigarette industry's S-system capacities. The broadcasters approached Congress with a unilateral offer to relinquish cigarette advertising over a four-year period. This offer ignored the cigarette industry's desire for legislative protection from the FTC's labeling rules. In an attempt to gain such protection, the cigarette industry countered by offering a much earlier withdrawal from the broadcast media. Congress then enacted legislation prohibiting the advertising of cigarettes on the broadcast media after January 1, 1971, requiring a stronger health warning, and requiring the FTC to give Congress six-months' notice before any new regulations of the cigarette industry took effect. The cigarette firms then informed the FTC that they would voluntarily include tar and nicotine content ratings in their advertising. These disturbances to the E-system affected by the D-system, i.e., $H_S(D,E)$, made up about 4 percent of all reported event outcomes during the period.

Period 4: Localized Controversies, 1971–1980

In 1971, the FTC notified Congress that it would require cigarette firms to sign consent decrees requiring that health warnings appear "clearly and conspicuously" in all advertising. In 1976, the FTC went to court to obtain a ruling that the industry's billboard advertising violated this decree and to claim damages. The Justice Department, acting on behalf of the FTC, sought court-imposed penalties and corrections of the consent-order violations. In addition, the FTC forced the cigarette industry to report more sales and advertising data and then "inadvertently" released the subpoenaed documents. Thus, the FTC continued to be a disturbing force for the cigarette industry.

Through petitions to governmental agencies, ASH initiated increasingly successful attacks on the cigarette industry. Specifically, ASH petitioned to protect nonsmokers' rights on trains, buses, airplanes, and in federal buildings. It persuaded the Food and Drug Administration (FDA) to have warnings enclosed with birth control pills to explain the increased dangers faced by smokers. ASH requested bans on "little cigar" broadcast advertising, on cigarette billboard advertising, on giveaways in cigarette promotions, and on smoking aboard airlines. It requested limits be placed on the pictorial content of cigarette advertising and restrictions be placed on smoking in workplaces. Through persistent effort, ASH was often eventually successful with its petitions, but the results usually affected smokers and smoking behavior rather than the cigarette industry and its methods of doing business, i.e., the E-system.

Successive surgeons general remained critical of the cigarette industry. Their reports consistently affirmed that smoking was dangerous to pregnant women, athletes, and children, that ambient smoke harmed nonsmokers, and that cigarette smoking had proven to be more rather than less dangerous. Their recommendations included bans on smoking in public places, in aircraft, and in federal buildings, the regulation of tar and nicotine content in cigarettes, along with other ingredients shown to be injurious to health, higher taxes on cigarettes, taxes on cigarette advertising, a phase-out of programs to support tobacco growing, lower insurance rates for nonsmok-

ers, stronger warnings, more funds for antismoking advertising, and new safety standards for workers who smoked and were exposed to industrial hazards. They also recommended more research to find a less hazardous cigarette and to discover why people smoked and how they could stop. But despite these many reports, the government has behaved in contradictory ways with respect to the cigarette industry, and few of the proposals made by the surgeon general have been acted upon. Instead, this potentially disturbing activity has remained confined to the isolated D-system, $H_{S,E}(D)$ and makes up approximately 68 percent of reported event outcomes.

About 12 percent of the reported event outcomes during the period were classified as occurring in $H_{D,E}(S)$ and an additional 8 percent as occurring in $H_E(D,S)$. For example, members of Congress from tobacco states continued to provide support to the industry, as did representatives of transportation firms and numerous advertising agencies. As a result, the many congressional initiatives to increase cigarette-industry taxes or to modify or cancel tobacco price-support programs were all defeated. In addition, lawyers for the cigarette industry obtained delays and favorable rulings in cases involving smoking restrictions on airlines and buses. They were also successful in obtaining rulings that showed that both the Consumer Product Safety Commission (CPSC) and the FDA lacked jurisdiction and the right to regulate the cigarette industry.

In sum, during the 1950s the cigarette industry established a skeletal basis for an S-system. While a basis for an S-system was still being developed, D-system disturbances had a direct impact on the E-system. In the mid-1960s, after the S-system was established, the surgeon general's potentially devastating 1964 report on smoking and health had little effect on the cigarette industry's operations. In the controversy over broadcast advertising, disturbances would also have been minimized if the coordination between broadcast and cigarette-industry representatives had not broken down.

The pattern in reported event outcomes in the smoking-and-health controversy in the period 1971–1980 has approached the ideal of protecting the E-system. Disturbances are increasingly confined to $H_{S,E}(D)$, and the antismoking target has tended to be smokers' behavior rather than the cigarette industry itself. Despite the increase in reported, potentially disturbing events during this period, direct disturbances from the D-system to the E-system, $H_S(D,E)$, were less than 2 percent of reported event outcomes.

That the cigarette industry has been successful in reducing disturbances to the E-system is supported by other studies. Although the per capita consumption of cigarettes has remained steady, Miles and Cameron concluded that based on financial indicators of industry health, "there is ample evidence that the Big Six [cigarette companies] have made significant progress toward the attainment of their goals of domain defense" (1982: 210) and that "despite its exposure to political risk and economic market stagnation over the past quarter century, on most grounds deemed important to the U.S. economy, the [cigarette] industry has continued to do *very well*" (1982: 212). Miles and Cameron (1982: 204) also

summarized data that showed that the comparative operating profits from cigarette businesses in firms that had diversified were still generally very favorable and often exceeded the profitability of their other businesses.

DISCUSSION

The analysis shows that during times of greatest controversy, T-system event outcomes depend on the extent to which the primary protagonists — members of the D-system and the S-system — can convince third-party organizations in the N-system to participate in threatening or protective efforts. To attract such support, the primary protagonists redefine the issues and bring in tangential concerns in order to clarify mutuality of interests. It is not surprising, therefore, that final outcomes and the logic used to justify them can be largely independent of the original issues (Anderson, 1983).

The findings have implications for those who manage protective systems and for those who wish to threaten such systems. Those who manage protective S-systems and maintain relationships with N-systems need to maintain a balance in the disturbance potential generated by ongoing events. As D-system activity is successfully confined to the isolated D-system, $H_{S,E}(D)$, it does not directly affect either the E-system or the S-system. It probably should be monitored but does not require any direct response by S-system managers. In contrast, those who would threaten a protected system cannot be effective if they allow events to be channeled into the isolated D-system. Initiatives must directly affect the E-system. Disturbance is more likely as N-system organizations can be persuaded to take actions that favor those positions held by members of the D-system. In this way, the S-system is denied access to third-party organizations that it might otherwise use to augment its protective shield.

This framework may have general application to a wide range of controversies involving, on the one hand, industries or corporations wishing to defend their operating practices and, on the other, government regulators wishing to change such practices. To apply the framework, the D-, S-, E-, and N-systems have to be carefully defined. However, once this has been done, the framework should enable managers on both sides of controversial questions to identify the threat potential of current events and the directions in which they should move in order to achieve their purposes.

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APPENDIX A: List of Sources

The following sources were used to compile a chronology of events summarizing developments in the cigarette-smoking-and-health controversy for the period 1950–1980.

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The complete chronology of 486 events is available on request from the authors.

APPENDIX B: Classification Procedure

The following steps were taken to obtain a classification of each event as belonging to one of the seven conjunctions in Figure 4:

1. Identify actions: The two raters independently worked through the chronology and identified distinct and separate actions.

2. Compute interrater agreement for identification of actions.

3. Compromise on identification of actions: The two raters jointly discussed and compromised on the identification of actions where they disagreed.

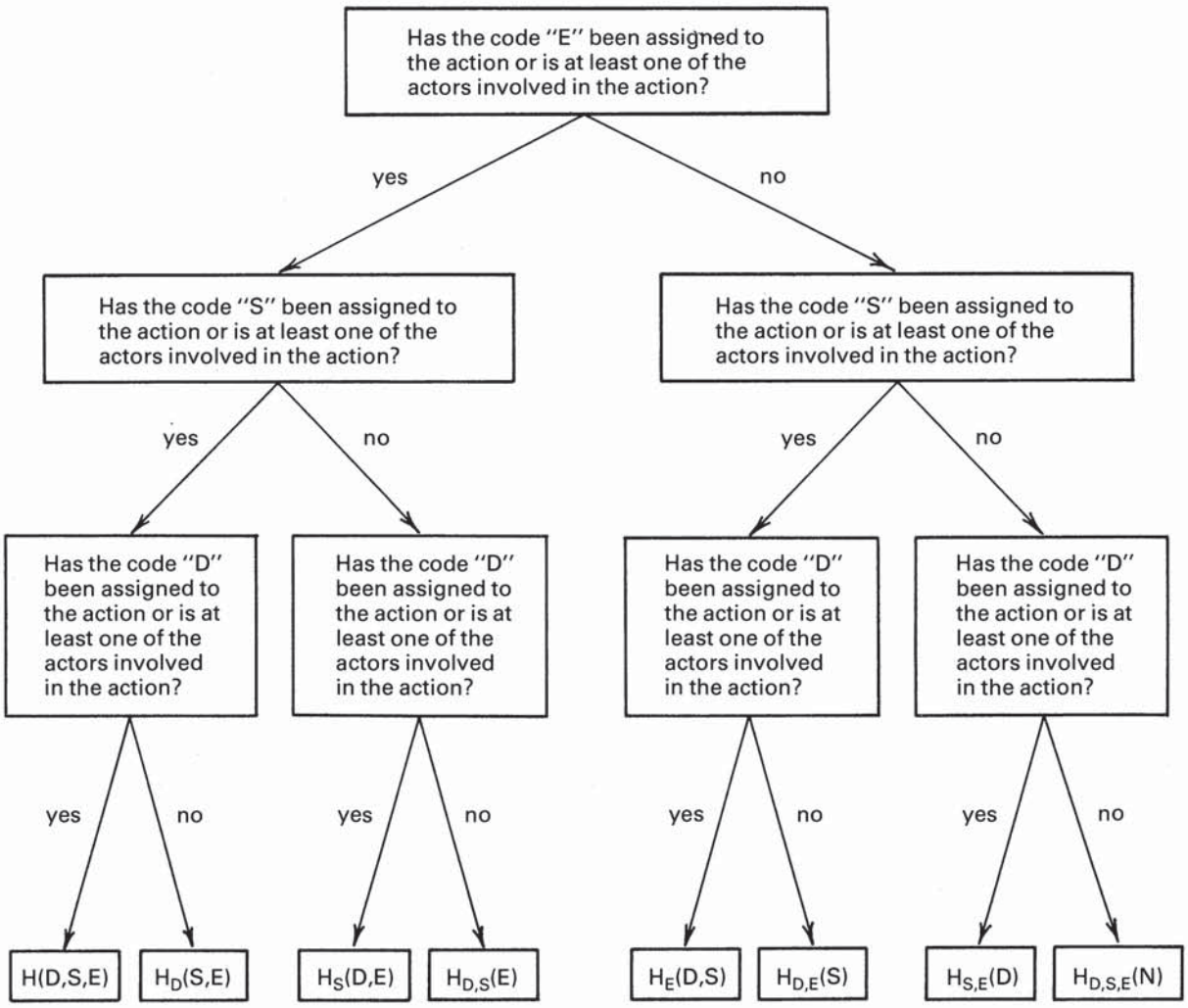
4. Code actions: The two raters independently coded the actions. Each action was assigned to one of the discrete, mutually exclusive D-, S-, E-, or N-system possibilities.

5. Compute interrater agreement for coding of actions.

6. Compromise on coding of actions: The two raters jointly discussed and compromised on the coding of actions where they disagreed.

7. Identify actors: The two raters independently worked through the chronology and identified the actor(s) involved in each action.

Figure B.1. Decision tree for coding events.



8. Compute interrater agreement for identification of actors.

9. Compromise on identification of actors: The two raters jointly discussed and compromised on the identification of actors where they disagreed.

10. Code actors: The raters independently coded the actors. Each actor was assigned to one of the discrete, mutually exclusive D-, S-, E-,or N-system possibilities.

11. Compute interrater agreement for coding of actors.

12. Compromise on coding of actors: The two raters jointly discussed and compromised on the coding of actors where they disagreed.

13. Code the event: An event was defined as an action (identified from steps 1 and 3 above) containing actor(s) (identified from steps 7 and 9 above). Events were coded by combining the action codes (assigned in steps 4 and 6 above) with the actor codes (assigned in steps 10 and 12 above). For example, an action coded as S that contains two actors, one of which was coded as S and the other as E would result in an event coded as H_D(S,E), the notation emphasizing that the S-system and the E-system were involved in the event, while the D-system which could have been involved, in fact was not.

The coding for each event was obtained by applying the decision tree shown in Figure B.1, with all events being coded into one of the eight categories listed at the base of the tree.

APPENDIX C: Interrater Agreement

The computation of interrater agreement for identification of actions and actors was more complex than a simple calculation of whether or not the two raters agreed or disagreed in identifying an action or actor, because the two raters may disagree in the number of actions and actors that they each identify. For this situation, the procedure that Landfield (1971: 53) employed was reformulated and used as follows:

$$\text{Percentage of interrater agreement} = (100)\frac{(X-Z)}{(X+Y)}$$

where X, Y, and Z are the number of actions or actors as follows:

X = number identified by rater 1
Y = number identified by rater 2 but not identified by rater 1
Z = number identified by rater 1 but not identified by rater 2

Once actions and actors were identified, coding them involved the assignment of each action and each actor to one of the four possibilities of D, S, E, or N. In this case, the raters either agreed or disagreed on the assigned code, since the number of actions and actors had been agreed upon and fixed (from steps 1, 3, 7, 8 in Appendix B). For the coding, the procedure employed was:

$$\text{Percentage of interrater agreement} = (100)\frac{(U-V)}{V}$$

where: U = number of actions (actors) coded
V = number of disagreements in coding the actions (actors).

The interrater agreements obtained prior to compromising is shown in Table C.1.

Table C.1. Percentage of Interrater Agreement

Interrater agreement	1950–1961	1962–1965	1966–1970	1971–1980
Identifying actions	96.3	80.6	90.7	97.5
Coding actions	85.2	92.3	90.8	96.7
Identifying actors	87.0	79.8	93.2	95.6
Coding actors	88.0	97.9	96.6	94.1