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DO SOCIAL MOVEMENTS MATTER TO ORGANIZATIONS?

AN INSTITUTIONAL THEORY PERSPECTIVE ON CORPORATE RESPONSES TO THE CONTEMPORARY ENVIRONMENTAL MOVEMENT

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by

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ABSTRACT

Social movements, defined as collectively held ideals, beliefs or opinions that promote or resist social change (Snow & Oliver, 1995; Zurcher & Snow, 1992; McCarthy & Zald, 1977; Maxwell & Oliver, 1984; Oliver, 1989) have become increasingly prevalent in American society (Macionis, 1995, p.625). To advance their agenda of social change, social movements put pressures on both American society in general and on specific segments of this society for change. American corporations represent one significant segment of American society often targeted by social movements. However, little is known about how social movements influence organizations (Oliver, 1991). This dissertation examines this issue by examining the impact of one social movement, the contemporary environmental movement, on organizational behavior. It asks the question, under what conditions do organizations respond to social movements?

A panel of fifty-seven firms from two industries was the focus of this study. These firms were followed from 1970 until 1995 to assess the impact of the contemporary environmental movement on their structures and actions. Institutional theory provided the basis for explaining how social movements influence organizations. Following institutional theory logic four primary forces were identified: public support, industry attention, legal support and regulatory support of the environmental movement.

The results suggest that firms do respond to social movements. In particular, firms were most likely to respond to increases in public support for and industry attention to the environmental movement. Further, contrary to conventional wisdom (c.f. Hardin, 1968) increases in coercion by the federal government in terms of legal mandates and regulatory power did not appear to influence organizational actions. Surprisingly, firms appear to learn

about their environment through watching other firms and not from their own experiences. Finally, and most generally, the findings suggest that social movements do influence organizational behavior even in the face of organizational inertia and financial constraints.

These findings have several implications for theoretical development. First, they suggest that the institutional environment should not be thought of as monolithic. The various institutional forces appear to influence firms differently. Further, the results suggest that direct coercion may not play an integral role in organizational action, as has been expected. Finally, these findings suggest that firms appear to learn about and experience their environments vicariously and that these lessons may be more powerful than a firm's own direct experiences. This implies that organizational learning from the environment may be a complex and multifaceted phenomenon.

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Before I began by dissertation it was difficult to imagine finishing it as it seemed too overwhelming and too large for any single person to tackle. But now reflecting back on my project I have learned that no single person did finish this project, though my name appears alone on the title. It was with the help and encouragement of many people that I am sitting here today writing this. I would like to take this time to remember, thank, and credit these many people for all of their assistance.

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CHAPTER ONE

INTRODUCTION AND OVERVIEW OF THE STUDY

Social movements, defined as collectively held ideals, beliefs, or opinions that promote or resist social change (Snow & Oliver, 1995; Zurcher & Snow, 1992; McCarthy & Zald, 1977; Maxwell & Oliver, 1984; Oliver, 1989), have become increasingly prevalent in American society (Macionis, 1995, p. 625). To advance their agenda of social change, social movements put pressures on both American society in general and on specific segments of this society. American corporations represent one significant segment of American society often targeted by social movements.

Social movement organizations and activists can target either specific companies or general industries or organizations for change. For example, concerns over *Nike*'s labor practices motivated college students across America to protest, publicize, and disrupt University activities to force a conversation about the issue. Along the same lines, protests against apartheid in South Africa led various organizations across the US to divest holdings in South Africa. More recently, animal rights activists have targeted specific drug companies and their business partners to expose and publicize laboratory animal treatment and welfare.

Events such as these create negative attention and adverse publicity for organizations. Social movement spokespeople, especially celebrities, can increase the visibility of these causes and further increase pressures on organizations. Research has suggested that such negative publicity can damage corporate reputations (Wartick, 1992) and performance (Trevino & Nelson, 1999, p. 24; Labich, 1992). Over time as these issues

become more publicized and more accepted in mainstream America, they may even become codified into law making them a permanent part of the organizational environment.

Some organizations have distinguished themselves by their willingness to attend to and address social concerns. Specifically, *Levi Strauss*, *Tom's of Maine*, and *Ben & Jerry's* (before the buy-out by *Unilever*) are well-known for their willingness to address and respond to social issues (Cohen & Greenfield, 1997; Trevino & Nelson, 1999). Conversely, other companies and industries have been less inclined to address or respond to changes in their social environment. Specifically, both *Dow Chemical* and *Johns Manville Corporation* denied reports that linked their products to significant health problems despite public pressure to accept responsibility (Trevino & Nelson, 1999). Further, despite continued conversations about the importance of diversity and pressures by the federal government, Hollywood continues to characterize individuals on television sitcoms, dramas, and comedies in ways that perpetuate racial, gender and ethnic stereotypes and prejudices (Trevino & Nelson, 1999).

This wide range of corporate responses to changes in the social environment raises an important research question: Under what conditions do organizations respond to social movements? This question is critical from two perspectives. First, while organizational changes are costly and time-consuming, failure to change when the environment demands it can also be costly (Lawrence & Lorsch, 1967). By better understanding when action is needed, firms can avoid unnecessary and potentially damaging choices. Secondly, from the perspective of the social movement, it is only through understanding the conditions under which real positive change can occur, that social change is really possible. This dissertation addresses and tests this research question.

Theoretical Model

The research question was examined by using an institutional theory model. Institutional theory models the effects of the social context on firm behavior (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Eisenhardt, 1988; Powell & DiMaggio, 1991). Firms comply with institutional pressures to acquire specific self-serving benefits such as social support or goodwill (Meyer & Rowan, 1977; Oliver, 1991). However, unlike prior research on institutional theory which assumed that institutional environments work collectively and in concert to facilitate organizational responses, I attend to the individual and independent institutional forces motivating action. By separating out these independent forces, I develop a more complete understanding of how institutional forces influence organizations. In general, I predict that organizations will consciously and strategically accede when confronted with significant pressures from the environmental movement.

The empirical model controls for possible alternative explanations of organizational action including structural inertia (Hannan & Freeman, 1977, 1984), financial constraints, top executive proclivities, and firm experiences.

Empirical Context

This dissertation examines this issue by exploring the impact of the contemporary environmental movement on organizational action. The contemporary environmental movement is widely considered one of the most important and successful social movements

of the Twentieth Century (Albrecht, 1976; Shrivastava, 1995; Gladwin, Kennelly, & Krause, 1995; Purser, Park, Montuori, 1995; Shrivastava & Hart, 1994). Broadly concerned with the quality of the natural environment and its effect on human health, the environmental movement has sustained popularity generally unexpected of social movements (Mitchell, 1989; Mauss, 1975). In fact, public opinion surveys consistently list environmental problems as one of the key issues facing American society (Derkson & Gartrell, 1993; Dunlap & Mertig, 1992; Dunlap, 1992). To a large extent it was this well-spring of public concern that provided the impetus for the numerous environmental laws and regulatory efforts since 1970 (Gore, 1994; Dunlap & Mertig, 1992).

The contemporary environmental movement demonstrates two key factors that make it a valuable topic of investigation. First, the contemporary environmental movement has acquired and sustained support which makes it important both theoretically and practically (Albrecht, 1976; Dunlap & Mertig, 1992). And, secondly, the environmental movement has become institutionalized within the United States. It enjoys a wide range of popular support influencing political and governmental agendas and activities (Derksen & Gartrell, 1993; Dunlap, 1992; Dunlap & Mertig, 1992, Mitchell, Mertig, & Dunlap, 1992). Therefore, the environmental movement provides a natural experiment for viewing the effects of institutional change on organizational behavior. To explore this phenomenon, I followed a panel of firms from 1970 until 1995[1] to access the impact the environmental movement of on organizational behavior.

[1] The starting date of 1970 was chosen for several reasons. First, 1970 marks the first Earth Day celebration and the year the Environmental Protection Agency (EPA) was founded. Both events mark the birth of the contemporary environmental movement (Albrecht, 1970). Second, the 1970-1995 period was a time of great variation in public and governmental support for environmentalism (c.f. Hays, 1987; Dunlap, 1992). The years immediately surrounding Earth Day 1970 were periods of great public and governmental

Potential Contributions

This study makes several contributions to the theoretical understanding of the process of organizational action, the practical understanding of socially supported organizational action, and the influence of the social environment on organizational behavior.

This study offers several contributions to institutional theory. First, examining the impact of the independent institutional forces, a better understanding of how institutional environments influence organizations may be developed. Research to date has assumed that all institutional forces work together and in concert to facilitate organizational action. The present study attempts to directly test this assumption by examining the effect of independent forces over time. I hope to develop some conclusions about the relative power of the various institutional forces through this analysis. Second, by simultaneously examining the effects of firms' social environment, direct experiences with that environment, and the experiences of other organizations with that same environment, I will offer some observations about how firms learn about their environments.

Practically, this study may offer insight into the processes of corporate social responsibility. By investigating the process of corporate social responsibility I hope to

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support for environmentalism, but public support leveled off during the latter parts of the 1970s, only to return to its early 1970s level at the time when the Reagan administration's deregulation strategies reduced governmental support for environmental initiatives (Dunlap, 1992; Hays, 1987). In spite of temporary increases and decreases in support, the 1970-1995 period marks the time when environmentalism became institutionalized in the US as a viable social movement and political topic.

develop an understanding of how to better encourage and facilitate such change in organizations. This understanding has potential policy implications. For instance, government actors could learn from a better understanding of the role of coercive forces in directly organizational action. More generally, this study will offer one of the first direct empirical examinations of the impact of social movements on organizational actions.

CHAPTER TWO

THEORETICAL MODEL AND HYPOTHESES

Institutional theory posits that firms are influenced by their social or institutional environment. The theory suggests that certain social environments take on a rule-like or legitimate status (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Zucker, 1977). These legitimate environments influence opinions, beliefs, values, and actions of both society in general and its individual members (Selznick, 1957; Zucker, 1977). Institutional theory then provides the basis for explaining how these social environments influence organizational action.

Social movements influence both individual and societal beliefs, opinions, and behaviors, actions, and outcomes (McCarthy & Zald, 1977; Snow & Oliver, 1995; Maxwell & Oliver, 1984; Oliver, 1989). Social movements, because they involve social beliefs that become legitimized over time, are an aspect of the social or institutionalized environment (Minkoff, 1994; Derkson & Gartrell, 1993; Dunlap, 1992; Dunlap & Mertig, 1992). It follows that institutional theory would provide a basis for explaining how social movements in general and the contemporary environmental movement in particular have influenced organizational action.

Institutional Theory

The Role of the External Environment

Institutional theory maintains that organizations are shaped by their social context. Organizational policies, procedures, and structure reflect aspects of the social context in which they are embedded (Meyer & Rowan, 1977; Eisenhardt, 1988). Organizations

integrate the expectations of various social constituents into their structures and behavior in order to achieve social legitimacy, defined as the acceptance of the firm by its external constituents (Deephouse, 1996; DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Meyer & Scott, 1983). Collectively, this logic suggests that firms will respond to changes in their social environment to gain or maintain legitimacy. It follows that legitimacy enhances a firm's access to socially controlled resources (Oliver, 1991; DiMaggio & Powell, 1983; Pfeffer & Salancik, 1977).

The contemporary environmental movement has been a particularly potent influence on American society since its inception in1970. Not only has it effectively changed American society by introducing concerns such as recycling, sustainability and conservation to our daily lives, it has also had a material and lasting effect on our government through introducing and enforcing new legal definitions of our relationship with the natural environment. In fact, research has suggested that two of the primary effects of the contemporary environmental movement have been to reshape and redefine public and governmental awareness of the quality and importance of the natural environment (Hays, 1987; Dunlap, 1992; Mitchell, 1989; Dunlap & Mertig, 1992). Following institutional theory logic, these fundamental changes have reshaped the very definition of social legitimacy and thereby, organizational structures and actions.

Previous research has suggested that organizations are particularly sensitive to the expectations of three social actors: Public opinion, important constituents, and governmental support (Deephouse, 1996; Meyer & Scott, 1983; Baum & Oliver, 1991; Meyer & Rowan, 1977). This suggests that it is not the presence of any given social movement or ideal that produces organizational action, but rather the support the movement

receives from others that influences organizational actions. By independently examining the effects of different social actors' support of the movement on organizational actions I hope to explain which aspects of the environmental movement have been most influential on organizations.

Implicit in this logic is the notion that firms respond to environments that are more powerful than they are (Oliver, 1991). This response to external pressures is both conscious and intentional in that it enables firms to increase their stability (Meyer & Rowan, 1977) and reputation (Elsbach & Sutton, 1992; Elsbach, 1994), while simultaneously decreasing the probability of potential sanctions (Oliver, 1991; Greenwood & Hinings, 1996). Previous research has suggested that firms are most likely to respond to environmental pressures when the consequences of non-conformity are especially damaging (Oliver, 1991; DiMaggio, 1988; DiMaggio & Powell, 1983), both public opinion and governments have such coercive power over organizations (Deephouse, 1996; Meyer & Scott, 1983; Baum & Oliver, 1991).

Public support. Public opinion has the role of setting and maintaining public standards of acceptability (Deephouse, 1996; Elsbach, 1994; Elsbach & Sutton, 1992; Galaskiewicz, 1984; Meyer & Rowan, 1977; Meyer & Scott, 1983). Public opinion has the ability to influence organizations both directly through the use of tactics such as consumer buying patterns (Meznar et al., 1994; Prahalad & Hamel, 1994) and indirectly by influencing legislators (Meyer & Rowan, 1977). Although public opinion can be expressed in a variety of ways, social movements are one of the more powerful expressions of public opinion (Meznar, et al., 1994). Previous research has demonstrated that social movements

can encourage firms to pursue socially responsible strategies, even at the expense of profitability (Meznar, et. al., 1994). Recently, one especially prominent social movement has been the contemporary environmental movement.

The environmental movement is widely considered to be one of the most important social movements of the Twentieth Century (Albrecht, 1976; Dunlap & Mertig, 1992). The contemporary environmental movement is defined by a concern for the quality of the natural environment and its effect on human health (Derksen & Gartrell, 1993; Dunlap & Mertig, 1992). It is founded on the belief that the world is facing an ultimate eco-catastrophe unless the abuse and destruction of the natural environment is stopped (Catton & Dunlap, 1980; Catton, 1976; Albrecht, 1976). The public popularity of environmentalism has grown since Earth Day 1970. After a relatively short period of public disinterest in the later 1970s, environmentalism has regained popular support (Derksen & Gartrell, 1993; Dunlap, 1992; Dunlap & Mertig, 1992) becoming a viable political force in the United States (Dunlap, 1992; Mitchell, Mertig, & Dunlap, 1992; Hays, 1987) and abroad (Caldwell, 1992).

The growth and popularity of the environmental movement has translated into significant pressure on business and industry (Shrivastava & Hart, 1994). Specifically, industries like chemicals and forest products have been targeted by environmentalists, and, have demonstrated increased awareness and concern for their impact on the quality of the natural environment (Allan, Kaufman, & Underwood, 1972; Heaton, 1994a, 1994b). More generally, the increasing popularity of "green" products and private sector investment in environmental protection evidence the significance of the environmental movement beyond specific industries or firms (Prahalad & Hamel, 1994). Together, this evidence suggests

that the contemporary environmental movement is an important aspect of their social environment that pressures firm behavior.

This suggests that public support for the environmental movement is an increasingly important influence on society and organizations (King, 1995; Hart, 1995; Jennings & Zandbergen, 1995). Public support for the environmental movement can be observed in two ways. First, public support of the environmental movement can be observed through the founding of environmental advocacy organizations (Mitchell et al., 1992; Dunlap & Mertig, 1992). Advocacy groups indicate an ability to inspire collective action on the part of the public. Further, previous research has found that increases in the organizational density of advocacy groups leads to increases in public activism (Minkoff, 1997, 1994; McAdam, 1995; Walker, 1983). Thus, these new organizations represent the potential for future action by both the newly founded organization and the public in general.

Secondly, public support for the environmental movement can be observed through the membership in environmental organizations (Dunlap, 1992). Given that public support plays an increasingly important role in organizational environments and that firms are likely to respond to powerful institutional actors, I predict that, when firms are confronted with a high level of public support for the environmental movement, they will respond to these institutional demands.

> **Hypothesis 1**: Public support of the environmental movement will be associated positively with a firm's likelihood to change their structures and actions.

Governmental support. The government is another powerful player in a firm's institutional environment (Deephouse, 1996; Jennings & Zandbergen, 1995). It has the

ability to both legislate changes in organizational structures and behaviors and enforce those mandates through regulatory control (Deephouse, 1996; Baum & Oliver, 1991; Galaskiewicz, 1984; Meyer & Scott, 1983). In this way, the government both defines and enforces its constituents' rights and responsibilities (Scott, 1995, p. 95; Campbell & Lindberg, 1990). This suggests that the government performs two distinct but interrelated tasks in a firm's institutional environment. One role the government performs is legislative (Meyer & Rowan, 1977). Laws represent society's formal expectations of individual and organizational behavior (DiMaggio & Powell, 1983, p. 150) and can be viewed as the formalized aspect of a firm's institutional environment (Meyer & Rowan, 1977). Further, laws often carry penalties for failure to comply with their prescriptions. As such, the firm's legal environment carries coercive power over organizations (DiMaggio & Powell, 1983).

The firm's legal environment can be conceived in two ways. First, the sheer volume of laws related to a specific idea or value is an indication of its importance much as language is an indicator of cultural values (Ott, 1989, p. 20-21). Thus, the number of laws enacted to protect the natural environment is a measure of the level of its importance and value to society.

Secondly, implied in the idea of laws is the notion of enforcement. Enforced laws are more important because they carry consequences. The threat of enforcement demonstrates the coercive power of the legal environment. Quite simply, laws that are enforced are more likely to encourage conformity (Oliver, 1991). One way of understanding enforcement is by examining prosecutions under the laws in question.

I expect that as the government enacts and enforces legislation requiring organizations to protect the natural environment against the potentially harmful byproducts

of their productive technologies, organizations may be expected to respond to these pressures (Oliver, 1991; Jennings & Zandbergen, 1995). Conversely, the lack of governmental legislation or enforcement protecting the natural environment may lead organizations to behave without concern for their potential effects on the environment.

> **Hypothesis 2A**: Legal support of the environmental movement will be associated positively with a firm's likelihood to change their structures and actions.

Enforcement can be considered from two perspectives: Actual enforcement that consists of enforcing existing laws and potential enforcement that signals the government's intent to enforce laws (Meyer & Rowan, 1977; Scott, 1992). An indicator of the government's intention to support and enforce laws is the financial support of the regulatory agency charged with enforcement. As the budget and size of a given regulatory agency grows, its prestige and ability to enforce existing legislation increases (Kimberly, 1976; Yuchtman & Seashore, 1967; Downs, 1967). The government's financial support of any given regulatory agency represents its potential for future action and therefore signals to organizations its coercive power (Oliver, 1991).

Agencies that are fully funded by the government will be perceived as viable and powerful aspects of an institutional environment. Funded agencies have the ability to enforce legislation. Thus, fully funded agencies put formal pressure on organizations to comply with governmental and societal expectations. In fact, organizational change can be viewed as a direct response to changes in the firm's legal and regulatory environment (DiMaggio & Powell, 1983, p. 150). Thus, the viability and prestige of regulatory agencies can be viewed as a significant aspect of a firm's institutional environment.

Agencies can be funded in two ways. First, they receive a yearly budget through the federal government. This budget represents their discretionary funding for that year (Kimberly, 1976; Yuchtman & Seashore, 1967). Secondly, an agency can be supported through full-time employees. This is a direct measure of the administrative power and prestige of the agency (Kimberly, 1976; Downs, 1967). The Environmental Protection Agency (EPA) is the key governmental agency charged with the enforcement of environmental laws. I expect that when the potential for institutional enforcement is high, as is the case with a fully funded and supported agency, organizations will respond to institutional requirements. Conversely, when the potential for institutional enforcement is moderate or low, organizations may avoid or delay organizational actions (Oliver, 1991, p. 168).

> **Hypothesis 2B**: Regulatory support of the environmental movement will be associated positively with a firm's likelihood to change their structures and actions.

Industry attention. Thus far I have assumed that public support and governmental support of the environmental movement has been unambiguous and consistent. Although, public opinion and government regulations place strong demands on organizational behavior, environmental regulation and public support have not been clear or consistent. In fact, environmental regulation and public support have been, at times, both fragmented and contradictory (Shrivastava & Hart, 1994; Derksen & Gartrell, 1993; Dunlap, 1992; Dunlap & Mertig, 1992). Periods of strong government support of environmental initiatives have been met with relatively tepid public support and weak governmental support has been met with robust public concern for the environment (Dunlap, 1992; Dunlap & Mertig, 1992).

Due to the shifts and changes in public and governmental support for the environmental movement, these aspects of the environment can be characterized as highly unstable, turbulent, and uncertain (Emery & Trist, 1965).

Highly unstable and uncertain environments place unique demands on organizations. When environmental uncertainty is high and organizations are unsure how to respond to specific environmental demands, they are likely to look to other influential organizations for guidance (DiMaggio & Powell, 1983, p. 151). Industry trade associations become one powerful source of information to organizations in times of uncertainty (DiMaggio & Powell, 1983, p. 151). These trade associations, through their journals, convey to member organizations legislative, regulatory, and societal trends that they think are important and of interest to the member organizations. It is important to note that these journals as a general practice do not suggest or imply appropriate responses to these trends, they only suggest that such trends exist and that managers need to consider them.

In ambiguous situations, industry trade associations and their journals can become especially powerful indicants of not only what member organizations are concerned with but what they should be concerned with as well. The attention industry trade journals give to specific ideas, issues or concerns can signal to members their need to attend to these concerns. Industry attention confers legitimacy to a social issue or concern in the eyes of member organizations (DiMaggio & Powell, 1983). The legitimizing power of industry attention can be particularly important in situations where societal and governmental support is not consistent. This is the case with the contemporary environmental movement (Gore, 1992, 1994).

It is expected that, as industry trade journals pay greater attention to the contemporary environmental movement, member organizations will respond to it. Conversely, as industry trade journals de-emphasize or ignore the contemporary environmental movement, member organizations will not respond to it.

> **Hypothesis 3**: Industry attention to the environmental movement will be positively associated with a firm's likelihood to change its structures and actions.

Taken together, these arguments suggest that the firm's external environment exerts significant pressure on the organization and that firms respond to these pressures to maintain social acceptability and access to socially controlled resources. Implicit in these arguments is the notion that firms respond to environments that have significant coercive power over the organization. I expect that various aspects of the firm's social environment will be positively associated with organizational change.

Controls

To account for plausible alternative explanations of the findings, five control variables were identified that could influence a firm's propensity to respond to social movements. These variables are firm history, organizational slack, the tenure of the top executives, firm age and firm size.

Firm History. Critical to the process of change is the ability to perceive the need to change (Lewin, 1935). Heider (1944, 1958) among others argued that perception is influenced by the characteristics of perceiver, characteristics of the object, and the context of the event (Brunswick, 1956). It is through context that prior experiences can influence

current perceptions. This phenomenon whereby past experiences influence current perceptions is called priming. Priming refers to the "effects of prior context on the interpretation of new information, ... the fact that recently and frequently activated ideas come to mind more easily than ideas that have not been activated" (Fiske & Taylor, 1991, p. 257). A firm's experiences with fines for environmental misconduct can influence their current perceptions by making their executives more aware of and more sensitive to environmental concerns. I expect that firms that have experienced environmental fines would be more likely to implement changes in response to the environmental movement than those that have not experienced fines.

Organizational slack. Organizational slack is defined as unused capacity and is measured by both the absorbed and unabsorbed capacity of organizational resources (Scott, 1992, p. 235; Bourgeois, 1981; Singh, 1983, p. 37-49, 1986). Resource availability or organizational slack is an important influence on organizational actions. Organizational adaptation often requires significant resources, and, deficiencies in these resources may constrain the ability of organizations to enact changes (Cyert & March, 1963; Waddock & Graves, 1997; Thompson, 1967, p. 150; Pfeffer & Salancik, 1978; Bourgeois, 1981; Boeker, 1997; Haveman, 1993; Miles & Cameron, 1982; Singh, 1986; Bromiley, 1991; Finkelstein & Hambrick, 1990). Further, one of the barriers to corporate social responsibility is financial constraints (Waddock & Graves, 1997; Dechant & Altman, 1994). Therefore, organizational slack is a key component of an organization's ability to adapt to environmental changes (Thompson, 1967, p. 150). It is expected that firms without

sufficient resources (organizational slack) are less likely to reflect changes in their institutional environment.

Top Executive Tenure. Recent research has suggested that top executives and their experiences within the firm may be a critical link for understanding and implementing organizational change (Bergh, 2001; Cannella & Hambrick, 1993; Finkelstein & Hambrick, 1996; Haspeslagh & Jemison, 1991). The organizational tenure of top executives consistently affects organizational change (c.f. Finkelstein & Hambrick, 1996 for cites).

While the exact form of the relationship between organizational tenure and change has been debated, recent research has argued that longer tenured executives gain unique understandings and insights into their firm's culture and climate that allow them to successfully implement change (Bergh, 2001; Jemison & Haspeslagh, 1991; Cannella & Hambrick, 1993). These years of experience translate into unique knowledge and understandings of their firms' histories. It is through this intimate knowledge of their firms that they are able to craft successful responses to environmental changes (Buono, Bowditch, & Lewis, 1985; Jemison & Sitkin, 1986; Haspeslagh & Jemison, 1992; Bergh, 2001). It is expected that longer tenured top executives will be more likely to implement responses to the contemporary environmental movement than their less tenured peers.

Structural inertia. Structural inertia theory suggests that a firm's own characteristics may limit and inhibit its ability to respond to environmental demands (Hannan & Freeman, 1984, 1989). Three characteristics have been argued to increase structural inertia. These are age, size, and complexity (Hannan & Freeman, 1984). In

general, it is expected that stronger inertial pressures will lower the organization's ability to respond to environmental demands. However, research has found that larger organizations tend to be more structurally complex (Mayhew, 1973; Mayhew, McPherson, Levinger, & James, 1972; Meyhew & Specht, 1973; van Broembsen & Gray, 1973; Hall, Haas, & Johnson, 1967; Lawrence & Lorsch, 1967). Therefore, only two sources of structural inertia are considered, age and size.

Firm Age. The liability-of-newness hypothesis suggests that younger organizations are more likely to fail than their older counterparts because they face the unique and high costs of initiating operations (Stinchcombe, 1965). However, there is a price to aging. While age provides a firm with the benefits of stability, acceptance, and consistency, it simultaneously lowers firm adaptability and flexibility (Hannan & Freeman, 1984). This suggests that as firms age, they are less likely to reflect changes in their external environment.

Firm Size. The liability of smallness posits that as organizations increase in size, they become increasingly institutionalized and as a result, less likely to fail (Hannan & Freeman, 1984; Freeman, Carroll, & Hannan, 1983). In general, as firms age they become increasingly bureaucratized and formalized (Merton, 1957; Scott, 1992, p. 260; Blau, 1970). This increase in structure and complexity provides the firm with stability, acceptance and consistency but again at the price of adaptability and flexibility (Hannan & Freeman, 1984). Hence, as organizations grow they become less likely to reflect the changes in their external environment due to the unwieldy size.

Taken together, this logic suggests that the firm's history, organizational wealth, top executive characteristics, firm age and firm size can complicate the relationship between a firm and its environment. Measures of these variables are included in my models.

CHAPTER THREE

METHODS

This study examines how firms respond to social movements. Accordingly, I have chosen to focus on two industries targeted by the environmental movement for significant change (Shrivastava & Hart, 1994; Lydenberg, 1980). Each of the two industries presents a unique position relative to the natural environment and the contemporary environmental movement.

Sample

Industry selection. The two industries that are the focus of this study are the forest products (SIC code 26) and oil and petroleum products (SIC code 13 and 29) industries.

The forest products industry (including paper and pulp products) was selected for several reasons. First, the industry is relevant from an environmental standpoint. As an extractive industry, the success of the forest products industry is directly tied to the consumption of natural resources (Sonnenfeld, 1980; Bunker, 1990). The relationship between consumption and success puts the industry squarely at the heart of many environmental debates. Secondly, the industry is a major contributor to industrial pollution (Allan, Kaufman, & Underwood, 1972; Lydenberg, 1980). As recently as 1970, the forest products industry was found to be responsible for approximately twenty-five percent of the industrial pollution in the Northeast and Southwest and seventeen percent in the Pacific Northwest (Lydenberg, 1980). This suggests that this industry is highly visible from an environmental standpoint. Third, the forest product industry was subject to a very public controversy between the Northern Spotted Owl and timbering practices in the Pacific

Northwest. This controversy focused public attention on the significance of industry practices and their impact on species diversity. Finally, a survey of industry executives recognized that non-market, social forces were a greater influence on the industry than market constraints (Sonnenfeld, 1980). This suggests that the industry will provide an interesting opportunity for assessing the roles of institutional pressures on changing organizational behavior.

The oil industry (including both the exploration and mining of crude oil production and petroleum refining) also provided a unique setting for examining the effects of the environmental movement on firm behavior. First, similar to the forest products industry, as an extractive industry its success depends upon the consumption of limited natural resources (Gilbert, 1993; Bunker, 1990). Unlike the forest products industry, the supply of crude oil is finite, which suggests that environmental issues and conservation are much more critical to this industry. Second, the oil industry is implicated in many of the debates in the environmental movement including air quality, water quality, and biological resources (Caswell, 1993; Mills & Toke, 1985; Neff, Rabalais, & Boesch, 1987; Earthworks, 1989). The discovery, mining, production and ultimate consumption of petroleum-based products present significant threats to the quality of the natural environment (Caswell, 1993; Jones, 1978, p. 330; Sperling & DeLuchi, 1993; Krupnick, 1993). This suggests that the most critical functions of this industry threaten the viability of the natural environment which makes it a visible and obvious target of the environmental movement. Further, the industry is critical to the health of the national economy (Gilbert, 1993, p. 1). This places oil in a central position in the environmental, energy, and economic policy debates in the US suggesting that this industry truly represents the tradeoff between

economics and the environment. Finally, several well-publicized accidents have raised public awareness and concern about this industry (Santa Barbara oil spill in 1969, Torry Canyon in 1968, Amoco Cadiz in 1978 and Exxon Valdez spill in Prince William Sound, Alaska). The cumulative effect of these disasters has been to raise public awareness and public and governmental pressure on the industry to conform with environmentally sensitive policies and procedures (Caswell, 1993).

Taken together, these two industries offer some unique similarities and important differences in assessing the impact of the contemporary environmental movement on organizational behavior. Both industries have experienced very public controversies or disasters that raised public awareness of their impact on the quality of the natural environment. The oil industry experienced several significant spills that endangered wildlife in Alaska and the California coast. The forest products industry experienced the spotted owl controversy that publicly pitted environmental quality against economic security. In both situations human health was compromised due to inadequate and negligent environmental practices.

As a result of these controversies, both industries have been targeted by the environmental movement as potential threats to the natural environment. But, the source of these threats differs between these industries. The forest product industry has been targeted for two reasons. First, the harvesting techniques used to acquire raw material logs impacts biological diversity which has resulted in standoffs between endangered species legislation and industry practices. Second, the production processes in the manufacture of paper result in significant pollution to surrounding environments. Oil is unique among extractive industries because both the extraction of raw material inputs and the consumption of their

ultimate product represents a threat to environmental quality. Together these industries represent different but significant threats to the viability of the natural environment. However, the important differences in the types of threats that they represent suggest that these firms may actually experience slightly different environments. These environmental differences should result in significant organizational diversity (Carroll, 1993).

Finally, in both industries, surveys of top executives have demonstrated that they recognize the significance of the social environment and its potential impact on industry health. Given the recognized importance of these issues to the industry and the fact that the environmental movement and public awareness have focused on these industries, they should demonstrate some responses toward these perceived threats. Given the diversity of threats that these industries represent, they can also be expected to demonstrate some diversity in responses to those threats.

Sampling procedure and time frame. The sampled firms were selected from Fortune 1,000 domestic firms using the Fortune's Double 500 Directory from 1970 and 1979. Firms from the Fortune 1,000 were selected for two primary reasons. First, due to their size and significant employment, these firms represent a very visible target for both the environmental movement and regulatory enforcement (Mitchell & Levy, 1989; Child, 1972; Shrivastava & Hart, 1994; Hill, Kelley, Agle, Hitt, & Hoskisson, 1992). Thus, the effects of the environmental movement on organizational behavior should be more apparent in this sample frame. Secondly, Fortune 1,000 firms provide more accessible and reliable data (Mezias, 1990).

All firms in the relevant industries were identified for the sample. These firms were selected into the sample based on three screens. First, only domestic firms were selected into the sample. These firms were selected because they are expected to be most directly influenced by the domestic social environment. International firms may confront so many conflicting social environments that it would be difficult to assess the impact of any one particular national environment on their behavior. Following this logic, firms were selected into the sample if fifty percent or more of their yearly sales in 1995 or their last year of operations came from the United States. Fifty percent was selected as the cut-off because this value represents a substantial investment by the firm which cannot easily be reversed (Hitt & Ireland, 1985; Hill & Hoskisson, 1987; Prahalad & Bettis, 1986). The ending date of 1995 or their last year of operations represents the most conservative assessment of domestic investment because global investment opportunities became increasingly common during the study period. Therefore, a firm that is substantially invested in the domestic market at the end of this period has chosen this investment despite increasing global opportunities.

Second, following previous research, firms were selected into the sample if fifty percent or more of their yearly sales came from the targeted industries (defined by two digit SIC codes) (D'Aveni & Illinitch, 1992). I assume that the social pressures discussed here are most salient for firms with serious investment in these industries. Again, this screen represents the most conservative definition of a dominant business and will provide the most rigorous test of the model.

Third, following Freeman, Carroll, and Hannan (1983) organizational death was defined as the end of an organization's routine activities as an independent entity. An

acquisition was considered an organizational death for the acquired firm, and mergers between two firms were considered to result in the death of the independent partners and the birth of the newly merged firm. All firm deaths were verified by examining *Moody's Industrial Handbook* and *Business Periodical Index*.

The years 1970 and 1979 were selected to include firms founded during the study and to ensure variability of organizational age. There were 115 firms in the Fortune 1,000 for these industries (64 Forest Products firms and 51 Oil and Petroleum firms). Each of these firms was then subjected to the sampling screens. Of the 115 firms in the population, fifty-seven firms were selected for the study. Of these firms, thirty-one firms from the forest products industry and twenty-six oil and petroleum products firms were selected. Sixteen percent of the firms were eliminated because their sales in the relevant SIC codes were insufficient. Six percent of the firms were eliminated because they were not primiarily domestic firms. Finally, thirty percent of the firms were eliminated due to missing data problems. Appendix A provides a table of sample frame of firms and the screens applied to them. Appendix B provides a detailed overview of the results of the sampling screens and the sample profile.

Because so many firms were lost to missing data problems, a separate analysis of the generalizability of the sample was conducted. This analysis compared the sampled firms to the non-sampled firms in the population on three variables: ROA which is a measure of firm profitability, the current ratio which is a measure of organizational slack, and total asset value which is a measure of firm size. (All firms were compared based on their 1970 values. This year was chosen to examine differences between the firms at the point of sampling.) Twenty firms were randomly selected from each industry. Ten of these firms

were accepted into the sample and ten were not. An analysis of variance (ANOVA) was performed on the data to access the differences between the sampled and non-sampled firms both within and across the industries for each of the variables. The results suggest that there are no statistically significant differences within each industry between the sampled and non-sampled firms on any of the variables. Specifically, the results suggest that neither the firms nor the industries are different in terms of profitability or organizational slack. However, it does appear that the industries differ in terms of size. The firms in the oil and petroleum industry tend to be the largest firms in the sample, while the forest product firms tend on the average to be the smallest. Further analysis indicates that there is no size difference between sampled and non-sampled firms within each industry. This leads me to conclude that the sample is representative of the population and that the results of this study will be generalizable to the targeted industries.

A power analysis was conducted to assess the ability of the sample to detect the true relationship between the variables. Statistical power is determined by three factors: The effect size, the probability level (alpha), and the sample size (Cohen, 1988; Pedhazur & Schmelkin, 1991). Effect size "refers to the degree to which the phenomenon is present in the population or the degree to which the null hypothesis is false" (Cohen, 1988, p. 9-10). In other words, effects size refers the magnitude of the true relationship between the variables (Jerrell & Ketchen, 1997). Following Cohen (1988), effect size for large, medium, and small relationships was designated as (f^2= .35, .15, .02 respectively). The probability level (alpha) refers to the probability of committing a Type I error (erroneously rejecting the null hypothesis). Following convention, alpha was set at .05. The sample size focused on the fifty-seven firms followed over the 26 years of the sample. This yielded a

sample size of 1482 (31*26 + 26*26 = 1482). This analysis suggests that across all years of this study, the sample size exceeded conventional power levels in that it can detect even the smallest relationships. In a survey of the strategic management research literature, Magid and colleagues concluded that only twenty-seven percent of the studies they surveyed had sufficient power to detect a large effect and only seven percent were sufficiently powerful to detect a small effect (Magid, Mazan, Hemmasi, & Lewis, 1987). Several more recent reviews have supported Magid and colleagues' findings (Schwenk & Dalton, 1991; Mone, Mueller, & Mauland, 1996; Jerrell & Ketchen, 1997). Considering these findings, this suggests that the present study's power level exceeds conventional power levels and may rank in the upper ten percent of all management studies in terms of power. Appendix C provides a detailed description of the power analysis.

These sampled firms were then followed from 1970 (or their founding date) until their death or the end of the study in 1995.

Dependent Variable

Organizational Response. Six dimensions of organizational response were identified. First, the number of contributions that the firm made to recognized environmental causes each year was counted. These contributions included gifts of money or other assets as well as employee time.

Second, changes to the firm's internal structure was defined as the creation of environmental departments, formally-structured environmental committees, appointment of top executives responsible for environmental activities, new environmentally sensitive work

procedures, and any formal policy statements directed toward environmental issues. Again these activities were counted for each year of the study.

Third, joint alliances between the firm and recognized environmental organizations were recognized. This variable also counted the number of relevant alliances for each firm for each year of the study.

Fourth, the implementation of energy conservation programs, pollution control programs, and recycling programs was measured (Shrivastava & Hart, 1994). These activities were also counted for each year of the study.

Fifth, the firm's marketing strategy was measured in two ways. First, "green" products and "green" marketing strategies were identified and counted. Secondly, formal recognition of environmentally safe behaviors was measured by counting the number of environmental awards for each firm during the each year of the study.

Finally, the incidence of environmental research and development was identified. This measured whether or not a firm invested in research and development targeted toward addressing a problem or concern with the natural environment. As with all other measures, this variable is a simple count of incidence of investments in environmental research and development during each year of the study.

It is important to note that this study focuses on organizational actions as opposed to their expressed rhetoric. Previous research has suggested that pro-environmental attitudes and rhetoric are socially acceptable and as such may not have much inherent meaning (Derksen & Gartrell, 1993).

In summary, this measure examines six dimensions of fundamental organizational responses that were totaled to render a dependent variable that is a simple count of the

number of relevant behaviors engaged in by each of the firms for each year of the study (1970-1995). As such independent non-cumulative counts of responses were calculated for each firm for each year of the study. Data for all aspects of this variable were available through the firm's annual report and were collected for each year of the study. As such, these are archival data. The data were simply reported or not reported in the firm's annual report. There was no judgment or discretion applied to the computation of this variable. It was a simple objective count of reported activities.

A distribution of the organizational responses for each firm for each year of the study is provided in Appendix D.

Independent Variables

Public support for environmental movement. Public support of the environmental movement was measured with two variables. The first of these is the number of national environmental advocacy organizations in existence each year of the study. Advocacy groups indicate an ability to inspire collective action on the part of the public and, as such, have been used as an indicator of involvement in and support of target issues. Increases in the organizational density of such groups have been shown to lead to increases in public activism (Minkoff, 1997, 1994; McAdam, 1995; Walker, 1983). The number of environmental advocacy groups was measured first by a simple count of the relevant organizations founded each year of the study and, second, by the total number of groups in existence each year of the study. Environmental advocacy groups were identified through two sources: *Gales Environmental Sourcebook* and *The Encyclopedia of*

Associations (subsections entitled conservation, ecology, environment, and wildlife conservation). Data for this variable was gathered for each year of the study.

The second measure of public support for the environmental movement was the total membership in national environmental advocacy organizations. Yearly membership was measured as the total membership in a random subsample of the environmental organizations in operation during each year of the study. Data for this variable were available in the *Encyclopedia of Associations* and was gathered for each year of the study.

Governmental support for the environmental movement. Governmental support for the environmental movement was measured along two dimensions. The first dimension was legislative support and this was measured with two variables. The first reflected major legislative efforts by the federal government. Major legislative efforts included both major environmental laws enacted by the federal government and executive orders signed by the President of the United States. Both were identified by a variety of sources including the *Environmental Encyclopedia*, *The Green Revolution* (a book detailing the history of the contemporary environmental movement in the US), *The Environmental Movement*, and the *Council on Environmental Quality's Annual Report on Environmental Quality*. These were recorded as a simple count of the number of new and amended laws enacted by the federal government and executive orders signed by the President during each year of the study. As with the public support data, legislative efforts were recorded two ways: (1) as the legislative efforts enacted during each year of the study and (2) as the cumulative total legislative efforts for each year of the study.

The second measure of the government's legislative support of the environmental movement was the number of prosecutions conducted by the EPA for each year of the study. These prosecutions were not limited to the organizations included in the study. The data for the environmental law prosecutions were available through the Council on Environmental Quality's *Annual Report on Environmental Quality* and verified through the EPA Library in Washington DC. The data were gathered for each year of the study.

The second dimension of the government's support of the environmental movement is regulatory support. It has been argued that the federal government may control the enforcement of specific legislation by controlling the level of financial support given to the federal agency charged with its enforcement (Frederick, Post, & Davis, 1992). This was measured by two variables. The first variable is the yearly budget of the EPA. The budget represents the total dollar value of financial support the federal government has given to the EPA for any year of the study. Data for this variable was available on a yearly basis through the *Budget of the United States Government* and the *Statistical Abstracts of the United States*. Data for this variable were gathered for each year of the study.

The second measure of the regulatory support is the yearly full-time employment by the EPA. The data for this variable are reported on a yearly basis and are available through the *Budget of the United States Government* and the *Statistical Abstract of the United States*. Data for this variable was gathered for each year of the study.

Industry attention. Industry attention to the environmental movement was measured first by identifying the primary industry trade journals. The head librarian for each industry at the Pennsylvania State University was asked to identify the primary

industry trade journal for their respective areas of expertise. The journals identified were as follows: For Oil and Petroleum Products industry *The Petroleum Press Service* which, in 1973, changed its name to the *Petroleum Economist* was identified and for the Forest Products industry *Pulp and Paper* was identified. For each journal the number of pages devoted to environmental issues relative to the number of journal pages available per year was calculated. This yielded a percentage of pages devoted to environmental issues for each year of the study and was used as a measure of issue relevance for the industry. Data for this variable were gathered for each year of the study.

Control Variables

Firm history. Firm history was assessed by the incidence of the fines each firm experienced from the EPA. This provided a measure of the firm's actual behavior toward the environment during the study period. A firm's environmental prosecutions were measured as a simple count of the relevant behaviors for each firm for each year of the study[2]. Data for this variable are available through the firm's annual and 10K reports and were collected for each year of the study.

Organizational slack. Previous research has identified two primary components of organizational slack (Bourgeois, 1981; Singh, 1983, p. 37-49, 1986). The first component

[2] According to the law, firms are not required to publish information about pending fines unless they expect that these fines will have a material impact on the firm's overall financial position. During the course of this study, the average fine levied against a firm for environmental misconduct was approximately $10,000.00. During this same period the firms in this study averaged sales in the tens of millions of dollars.

taps the firm's unabsorbed resources. These resources are the firm's uncommitted cash flow and are measured by the current ratio (total current assets to total current liabilities) (Singh, 1986; Tracy, 1989, p. 144). This measure is commonly thought of as the firm's short-term solvency and is a generally accepted measure of the firm's immediately available resources (Tracy, 1989, p. 144). The second component of slack is the firm's absorbed capacity. This measure taps the firm's "excess costs in organization" (Singh, 1986, p. 567). In other words, it measures the firm's current commitment to specific and general administrative expenses. This is measured by the ratio of selling, general, and administrative expenses to total sales (SG&A/sales) (Singh, 1986). Both ratios were collected for each firm on a yearly basis from their annual reports. Data for these variables were gathered for each year of the study.

Top Executive tenure. Top executive tenure was defined as the number of years of service the executive has been associated with that particular firm. Separate measures were gathered for the CEO and the top management team. The top management team variables reflect the mean value on that specific variable. All data for executives were available through Dun and Bradsteet's *Book of Corporate Management* and gathered for each year of the study.

Firm Age. Firm age was measured as age in years since the incorporation of the firm. Data for this variable are available through Moody's *Industrial Handbook* and was gathered yearly.

Therefore, reporting this data was clearly voluntary. Further, for those firms electing to disclose this data,

Firm Size. Firm size was measured with two variables. First, the physical capacity of the organization was measured by total asset value (Kimberly, 1976). Second, the total number of employees was gathered to measure the personnel available to the organization (Kimberly, 1976). Data are available through the firm's annual reports and were collected for each year of the study.

Table 1 provides an overview of each concept and its operationalization.

Research Design

The sample of firms was followed from 1970 until 1995 to study the relationship between the contemporary environmental movement and firm behavior. Measures of all variables were taken for each year of the study. The organizations were analyzed as a pooled time series to determine which characteristics have the greatest influence on organizational response (Sayrs, 1989). By examining the same panel of firms over multiple years, this design enables me to assess shifts and changes in this relationship over time (Bergh, 1995). Campbell and Stanley (1963) refer to this design type as a quasi-experimental recurrent institutional cycle design.

This design has several advantages and some limitations. The primary advantage of this design is its unique capacity to assess the phenomenon of maturation. Since the process of maturation (which Campbell and Stanley (1963) define as the process by which individuals grow more experienced with normal societal expectations and behaviors) is a primary focus on this study, this design provides unique advantages over other research

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reporting the value of any pending fine was also voluntary.

designs. Traditional cross-sectional designs tend to confound maturation effects with selection and mortality effects. Similarly, traditional longitudinal designs tend to confound maturation with repeated testing and mortality effects. However, the combination of these two design types addresses both of these limitations by facilitating both between and within group comparisons across the study. In terms of the study, this allowed a complete test of the hypotheses over time.

Potential bias within the sample introduces another potential weakness in the design, selection effects. Selection enters the study when individual participants are selected into the study based upon some characteristic, which then in turn affects their behavior. The change in behavior noted over the course of the study is not the result of some intervention, but rather the result that selection characteristic (Campbell & Stanley, 1963). To the extent that organizations in the selected industries were systematically different from those in other industries, selection bias may enter the study and influence the results. This then presents a potential limitation to the findings. However, to control for this potential bias, the sampled firms were compared with a randomly selected group of non-sampled firms from the same industries on measures of profitability and size to determine if there are any significant differences between the two sets of firms on either variable. None were uncovered.

Table 1
Concepts and Operationalizations

Concept **Dependent Variable (Label)**	**Operationalization**
Organizational Response (Structure, Process, Mktg, Gift, Alliance, R&D, Award, Response)	Changes in Firm Structure Changes in Firm Productive Processes Introduction of New Green Products or Marketing Strategies Donations to Recognized Environmental Causes Alliances with Environmental Organizations Research and Development on Environmental Problems Receive Environmental Award
Independent Variables	
Public Support (Cum Env Org, Membership)	Cumulative Number of Environmental Organizations Membership in Environmental Organizations
Legal Support (Cum Laws & EO, EPA Prosecutions)	Cumulative Number of Laws and Executive Orders Total Prosecutions by the EPA
Regulatory Support (EPA Budget, EPA Emp)	EPA Budget EPA Employment
Industry Attention (Total Articles)	Percentage of Pages in Primary Trade Journal devoted to Environmental Issues
Control Variables	
Organizational Tenure (CEO Org Tenure, TMT Org Tenure)	CEO and average Top Management Team tenure in years
Organizational Slack (Current Ratio, Long Term Slack)	Current Ratio Selling, General & Administrative Expenses / Sales
Firm Age (Firm Age)	Age in Years since Incorporation
Firm Size (Total Assets, Firm Emp)	Total Asset Value Total Number of Full Time Employees
Firm History (Fines, Pending Cases)	Number of Fines Experienced by Firm Number of Pending Fines facing the Firm

CHAPTER FOUR

CORRELATIONS AND DIAGNOSTICS

Correlations

Dependent Variables. Table 2 provides means, and standard deviations and Tables 3A and 3B provide correlations. Several relationships become apparent in these analyses. First examining Table 3A, while the dependent variables are significantly correlated with one another, they are not highly correlated. Highly correlated variables are defined as those in excess of .8 (Neter, Wasserman, & Kutner, 1989, p. 408)[3]. This suggests that while all are tapping into the same conceptual phenomena, organizational response, each variable is measuring a unique aspect of response. All of the individual measures of organizational change were added together to create a composite measure of organizational change. This composite variable was then used to answer the question: Under what conditions did organizations respond to the changes in the independent variables?

Sample Firms. The correlations in Table 3B also reveal some interesting differences among the sample firms. The data suggest that forest product firms appear to be more financially secure than the oil firms. Both measures of organizational slack, long

[3] Given the large sample size (N=1482) which represents the pooled observations of 26 years of the 57 firms), the significance levels of the correlations could not be reliably computed. Dependencies within the data could not be adjusted for these analyses. However, adjustments were made to the regression analyses that removed the effects of dependencies from those results. Therefore, those results can be interpreted with more confidence.

term (slack r=.315 p<.01) and short term (current ratio r=.315 p<.01), suggest that forest product firms are more financially stable than the oil firms.

Independent Variables. The correlations also reveal interesting relationships between the independent variables. Unusually high correlations – correlations exceeding .8 - between variables may indicate the presence of multicollinearity (Kennedy, 1992, p. 180). Specifically, the following relationships were found to be potentially problematic: EPA employment and cumulative environmental organizations (EPA emp and env orgs r=.876; p<.01), cumulative environmental organizations and cumulative laws and executive orders (env orgs and law & EO r=.978, p<.01), cumulative environmental organizations and membership (env orgs and membr r=.950, p<.01), cumulative environmental organizations and prosecutions by the EPA (env orgs and pros r=.753, p<.01), cumulative laws and executive orders and EPA employment (law & EO and EPA emp r=.883, p<.01), membership and EPA employment (membr and EPA emp r=.888, p<.01), cumulative laws and executive orders and EPA employment (laws & EO and EPA emp r=.876, p<.01), membership and cumulative laws and executive orders (membr and laws and EO r=.973, p<.01), and cumulative laws and executive orders and EPA prosecutions (laws & EO and pros r=.630, p<.01). These correlations indicate the possibility of multicollinearity among these variables. Further analysis of the variance inflation factors was conducted to determine which relationships were truly problematic (Neter, Wasserman, & Kutner, 1989, p. 408).

Diagnostics

Multicollinearity. Variance inflation factor (VIF) analysis was performed on the data to determine the presence of multicollinearity. A VIF equal to or in excess of 10 indicates the presence of harmful multicollinearity (Kennedy, 1992, p. 183). In this analysis multicollinearity was detected. The variables most affected by multicollinearity were cumulative environmental organizations (VIF=107.038), EPA employment (VIF=9.885), cumulative laws and executive orders (VIF=79.351), and membership (VIF=33.174). Considered in conjunction with the correlational analysis, these results confirm that the relationship between cumulative environmental organizations and membership and the relationship between EPA employment and cumulative laws and executive orders were problematic.

Following Kennedy (1992, p. 184) additional regressions were performed to remove the effects of multicollinearity in the results. When the variables were highly correlated, independent analyses were performed to discern the separate effects of each of the correlated variables. These independent analyses are referred to in the text as Model 1 and Model 2. These independent models separate collinear variables such that reliable estimates can be provided. Where a model is not indicated, the reader is directed to the full model as multicollinearity did not appear to influence these estimates.

Autocorrelation. Since the data set is longitudinal, it is by definition open to potential presence of autocorrelation (Neter et al., 1989, p. 484). The Durbin-Watson (DW) test was used to determine if autocorrelation was present (Kennedy, 1992, p. 121). Given the configuration of the data base as a panel of firms followed over twenty-six

years, there are two potential sources of autocorrelation in the data set.[4] First, repeated observations of the firms themselves may introduce autocorrelation into the results. To control for this potential source, I have included dummy variables for the firms in each equation. Neter and his colleagues recommend this as the first and most powerful remedy for autocorrelation in data sets such as these (Neter et al., 1989, p. 494-495).

Secondly, repeated observations of the independent and control variables may also introduce autocorrelation into the results. To test for the presence of this I examined graphs of autocorrelation in the individual variables. These graphs indicated that none of the variables were problematic. Further, I verified these results with the Durbin-Watson (DW) statistic. The DW is used to determine if autocorrelation is present (Kennedy, 1992, p. 121; Neter et al., 1989, p. 491-494). The data were first analyzed with ordinary least squares (OLS) regresion and the DW as requested. The DW ranges from zero to four. When the DW is approximately two (the exact critical value depends upon the size of the study), one can conclude that autocorrelation is not present in the results. For all analyses, the DW statistic fluctuates between 1.89 and 1.85 and are all comfortably above the upper bound value for the DW statistic of 1.78 (Neter et al., 1989, p. 642). As a result, all subsequent analyses were conducted with OLS regression.

[4] I would like to thank Dave Harrison for his help and insights into this issue.

Table 2
Means and Standard Deviations

Variable	Mean	Standard Deviation
Award	.1516	.83723
Gift	.1177	.42288
Marketing	.1496	.67942
Structure	.1568	.4936
Process	.3075	.68338
Alliance	.0712	.32611
R&D	.0429	.21151
Response	.9973	2.0243
Current Ratio	1.775	1.03378
Fines	.394	1.79067
Forest Firms	.5567	.49693
Pending	65.39	1951.94469
Long Term Slack	.0881	.06167
Year	82.5	7.50237
Total Articles	.0197	.01791
Cum Env Orgs	217.346	69.3416
EPA Emp	11884.923	3642.60936
Cum Law & EO	176.4231	24.62354
EPA Budget (log)	9.6051	.25426
Membership	5529639.6	3044126.4828
EPA Prosecutions	2320.231	1247.25528
Firm Age	55.342	25.89454
Firm Emp	20887.267	175353.05577
Total Asset Value (log)	9.2718	.65985
TMT Org Tenure	20.4599	7.51802
CEO Org Tenure	26.7345	9.98275

Table 3A
Correlations Between Aspects of Dependent Variable

	1	2	3	4	5	6	7
1 Award							
2 Gift	.153						
3. Mktg	.411	.215					
4 Structure	.036	.166	.135				
5 Process	.089	.165	.137	.177			
6 Alliance	.148	.250	.191	.266	.180		
7 R&D	.061	.076	.057	.137	.231	.088	
8 Change	.653	.489	.667	.455	.551	.474	.290

Given the large sample size (N=1482) correlations above .15 are statistically significant. However, these correlations do not account for possible dependencies in the data and therefore these significance tests should not be used to make any inferences about the bivariate relationships. However, the regression analyses used to test the hypotheses and reported in Tables 4 and 5 do adjust for the dependencies and therefore these tests of statistical significance can be interpreted with more confidence**.**

Table 3B
Correlations

Variable	1	2	3	4	5	6	7	8
1. Response								
2.Current Ratio	-073							
3.Slack	-009	093						
4.Fine	007	-065	-093					
5. Pending	030	-021	003	-006				
6.Forest	-002	315	315	-020	-038			
7.Year	221	-269	-066	019	050	013		
8.TMT Org Ten	119	-102	-154	051	003	-197	067	
9.CEO Org Ten	047	-105	-053	046	-006	-208	054	368
10. Member	200	-215	-089	073	053	011	928	069
11. Cum Env Org	198	-27	-07	013	044	016	992	062
12 Law & EO	161	-257	-10	050	045	018	971	067
13.Pros	217	-202	-06	-002	042	016	767	047
14.EPA emp	211	-236	-058	039	064	006	92	076
15.EPA Budget	076	-136	-054	051	024	02	505	04
16.Art Total	225	22	243	-052	-001	422	-235	-101
17.Age	134	-157	-108	095	002	-18	242	33
18.Emp	177	-179	-054	149	023	-10	-002	165
19.Asset	238	-375	-274	134	024	-41	371	326

*Given the large sample size (N=1482), correlations above .05 are statistically significant. However, these correlations do not account for dependency in the data and therefore these significance tests should not be used to make inferences about the bivariate relationships. However, the regression analyses used to test the hypotheses and reported in Tables 4 and 5 do adjust for dependency in the data and therefore these tests of statistical significance can be interpreted with more confidence..

Table 3 (continued)
Correlations

Variable	9	10	11	12	13	14	15	16	17	18
10	058									
11	051	95								
12	05	973	978							
13	038	63	753	701						
14	046	888	89	876	676					
15	01	504	515	506	199	496				
16	-096	-263	-266	-348	-15	-179	-005			
17	17	24	241	241	168	224	121	-136		
18	018	-21	006	017	-025	-013	-007	-095	27**	
19	176	375	376	382	248	329	168	-347	479**	738**

*Given the large sample size (N=1482), correlations above .05 are statistically significant. However, these correlations do not account for dependency in the data and therefore these significance tests should not be used to make inferences about the bivariate relationships. However, the regression analyses used to test the hypotheses and reported in Tables 4 and 5 do adjust for dependency in the data and therefore these tests of statistical significance can be interpreted with more confidence..

CHAPTER FIVE

RESULTS

The findings are reported in Tables 4 and 5. Table 4 presents the results with standardized beta coefficients and Table 5 presents the unstandardized coefficients. The results across the two tables are consistent. This chapter presents the results with the standardized beta coefficients so that effect sizes can be compared in a meaningful way. [5] Dummy variables for the firms included to control for autocorrelation, are not shown in the tables due to space constraints.

Institutional Theory

Public Support. Hypothesis 1 predicts that public support of the environmental movement is associated positively with a firm's likelihood to change its structures and actions. The results in Table 4 indicate that while the yearly membership in environmental organizations is related to the incidence of organizational response, the cumulative number of these organizations in the environment is not (Model 1: cum env orgs: b = -.068, NS; Model 2 membership: b = .227, p<.01). Thus, increases in some forms of public support for the environmental movement, specifically, the membership in environmental advocacy organizations, are associated with increases in organizational response. This provides partial support for Hypothesis 1.

[5] There are concerns about using standardized betas in this type of regression. In particular, standardized betas can be influenced by errors (Hanushek & Jackson, 1977, p. 78-79). However, in the present study the sample size is quite large thereby reducing the errors and their problematic effects.

Governmental Support. Hypotheses 2A and 2B posit a relationship between the government and organizational response. Specifically Hypothesis 2A predicts that legal support of the environmental movement is associated positively with a firm's likelihood to change its structures and actions. The results in Table 4 indicate that the number of laws enacted to protect the natural environment (Model 1: Cum laws & EO: b = .072, NS) is not related to response, while the aggregate number of prosecutions by the EPA (Model 2: EPA prosecutions b = .140, p<.01) is associated with organizational response. Thus, the relationship between legal support and organizational response is mixed. While having more laws on the books does not motivate responses, the extent to which these laws are enforced through EPA prosecutions is influential. Therefore, the data provide only partial support for Hypothesis 2A.

Hypothesis 2B predicts that regulatory support of the environmental movement is associated positively with a firm's likelihood to change its structures and actions. The results fail to support this prediction. Although changes in the EPA budget (Model 1: EPA budget b = -.130, p<.01) are associated with organizational responses, it is not in the expected direction. Further, changes in EPA's employment are not associated with organizational response (Model 2: EPA emp: b = .112, NS). Together the results suggest that increases in regulatory support are not associated with incidences of organizational response. Thus, the data fail to support Hypothesis 2B.

Industry Attention. Hypothesis 3 predicts that industry attention would be associated positively with a firm's likelihood of changing its structures and actions. The results in Table 4 indicate that industry journals attention to the environmental movement

is positively and significantly related to organizational response (total articles: b = .358; p<.01). Thus, the data support the prediction in Hypothesis 3.

Collectively, these results of the tests of Hypothesis 1 through 3 provide support for the notion that changes in the firm's external environment will be associated positively with organizational response.

Control Variables

Examining the relationships between the three control variables and organizational response reveals some interesting relationships.

Firm History. I speculated earlier that firms that have experienced fines or face pending legal action may be more responsive to the pressures presented by the environmental movement than those that have not faced similar threats. Unfortunately, firms are not required by law to report each individual legal action they are facing. They are only required to report those that represent a substantial threat to the firm's financial position. During the course of this study, fines imposed by the EPA generally did not exceed $10,000. As many of the sample firms reported annual sales in excess of tens of millions of dollars, reporting pending legal actions valued at only $10,000 was voluntary. Unfortunately, many firms in this sample did not elect to report this data. However, for those firms that did elect to report this data some interesting relationships were uncovered. The results in Table 4 indicate that neither the impending threat of legal action against the firm nor an actual fine were consistently associated with organizational response (pending cases b = .006, NS; fines b = -.027, NS). It appears the firms that

admit to pending legal actions and/or outstanding fines were no more or less likely to respond than those that did not report these pending legal actions or fines.

Organizational Slack. Surprisingly, the results in Table 4 indicate that the firm's financial resources had no impact on organizational response (long term slack b = -.033, NS; current ratio b = -.036, NS). Conventional wisdom has suggested that firms that are on more solid financial footing are more likely to respond to environmental pressures than those that are not. These data do not support that position as neither the long nor short-term measures of organizational slack were significantly related to organizational response.

Top Executive Experience. It was expected that top executives with longer organizational tenure would have more experience and greater understanding of the organization and its history. This knowledge would then enable the executive to implement change more successfully. The results in Table 4 do not support this expectation. Neither CEO nor top management team tenure was associated significantly with organizational responses (Model 1: CEO Org Ten b = -.022, NS; Model 2 TMT Org Ten b = .071, NS).

Firm Age. I speculated that organizational age would be associated negatively with a firm's likelihood of changing its structures and actions. The results in Table 4 indicate that organizational age is not related to organizational response (firm age: b = .616; NS).

Firm Size. Contrary to my expectations that organizational size would be associated negatively with a firm's likelihood to change its structures and actions, the results suggest that increases in some measures of size were significant and positively associated with organizational responses (Model 1: total assets: b = .355, p<.01; Model 2: firm emp b = .112, NS). These results suggest that increases in some forms of organizational size are positively associated with organizational response.

Collectively, the age and size results fail to support the structural inertia argument that larger more bureaucratic firms are less likely to respond than smaller firms, and, actually support the opposite contention that larger firms were more likely to respond.

Table 4
Influences on Organizational Responsiveness[1]

Variable	Full Model	Model 1[2]	Model 2
Current Ratio	-.036	-.032	-.036
Long Term Slack	-.033	-.044	-.036
Fines	-.027	-.014	-.025
Pending Cases	.006	.011	.007
CEO Org Ten	-.012	-.002	
TMT Org Ten	.069		.071
Total Articles	.358**	.434**	.387**
Cum Env Org	-.145	-.068	
EPA Emp	-.027		.007
Cum Laws & EO	-.466*	.072	
EPA Budget	-.059	-.130**	
Membership	.518**		.227**
EPA Prosecutions	.153**		.140**
Firm Age	.616	-.730	-.130
Firm Emp	.007		.112
Total Assets	.371**	.355**	
	F = 7.043**	F=7.125**	F = 7.207**
	R2 = .320	R2 = .305	R2 = .309
	DW[3] = 1.885	DW = 1.845	DW = 1.857

- p<.05 ; ** p< .01
- Given size constraints, the results for the dummy variables for firm effects are not reported here.

[1] All beta values reported are standardized betas
[2] Models 1 and 2 remove the effects of multicollinearity in some independent variables

[3] DW indicates the Durbin Watson statistic

Table 5
Influences on Organizational Responsiveness[1]

Variable	Full Model	Model 1[2]	Model 2
Constant	-2.124	-4.759	-1.594
Current Ratio	8.757 E-02	-7.798 E-02	-8.781 E-02
Long Term Slack	-1.094	-1.478	-1.198
Fines	-2.946 E-02	1.476 E-02	-2.773 E-02
Pending	5.974 E-06	1.48 E-05	6.976 E-06
TMT Org Tenure	1.973 E-02		2.029 E-02
CEO Org Tenure	-2.587 E-03	-5.318 E-04	
Member	3.821 E-07**		1.670 E-07**
Cum Env Orgs	-4.626 E-03	-2.176 E-03	
Cum Laws & EO	-4.305 E-02*	6.669 E-03	
Prosecutions	2.717 E-04**		2.497 E-04**
EPA Emp	-1.675 E-05		4.678 E-06
EPA Budget	-.509	-.891**	
Total Articles	44.858**	54.148**	48.538**
Firm Age	5.378 E-02	6.347 E-02	-1.134 E-02
Firm Emp	8.108 E-07		1.392 E-05
Total Assets	1.257**	1.202**	
	F=7.043** R2=.320	F=7.125** R2=.305	F=7.207** R2=.309
	DW[3]=1.885	DW=1.845	DW=1.857

*p<.05; **p<.01
Given size constraints, the results for the dummy variables are not reported.

[1] Unstandardized beta coefficients reported.
[2] Models 1 and 2 remove the effects of multicollinearity in some independent variables.

[3] DW indicates the Durbin Watson statistic

CHAPTER SIX

DISCUSSION AND CONCLUSIONS

This study examined the conditions under which firms respond to social movements by examining the effects of the contemporary environmental movement and firm characteristics on organizational response. Particularly, it addressed the following question: Under what conditions do firms respond to social movements?

Taken together, the results from Hypotheses 1 through 3 provide insight into this research question. The results provide support for the notion that organizations act in response to external environmental changes. Collectively, the findings suggest that the most powerful predictors of organizational response are public support of and industry attention to the contemporary environmental movement.

Why do firms act?

The External Environment

The Roles of Public and Industry Support. The results indicate that firms most closely attend to the demands of the social or institutional environment and that these demands overwhelm the effects of structural inertia, finances, firm histories, and executive proclivities. Specifically, the results show that public support of and industry attention to the contemporary environmental movement are associated with organizational response. This finding generally supports Meznar and his colleagues' explanation that popular support for a social movement may facilitate organizational change despite organizational constraints (Meznar, Nigh, & Kwok, 1994). In a study of

the anti-apartheid movement and firm investment patterns, they found that firms disinvested from South Africa despite the market value losses associated with such actions. The authors speculated that the firms were responding to increased public pressure rather than rational economic concerns. This study extends their research by explicitly uncovering a relationship between public support of and industry attention to a social initiative and firm behavior in a different setting.

The Role of Governmental Support. Surprisingly, the findings do not support for the expectation that increases in governmental coercion (via the number of laws enacted to protect the environment and the EPA's employment) would lead to increases in organizational response. This finding contradicts both conventional wisdom and traditional institutional theory logic (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Hardin, 1968; Ophuls, 1977; Heilbroner, 1974). However, previous research on institutional theory has speculated that, when there is little common agreement concerning the utility or validity of governmental demands, strong resistance to such demands can and will develop (Tolbert & Zucker, 1983, p. 27; Rowan, 1982; Oliver, 1991; Goodstein, 1994). In a brief review of the evolution of environmental concerns in the United States, Gore (1994) concluded that the environmental movement has been characterized by considerable disagreement over environmental legislation and even the definition of environmental concerns as a problem for society. In light of this, the findings that organizations did not immediately comply with governmental demands (as expressed through legislation and some forms of regulatory power) is not as surprising as initial expectations would suggest.

The Role of Consensus in the Institutional Environment. Considered collectively, the public, industry and governmental support findings offer an important implication for institutional theory. Traditional institutional theory logic suggests that all institutional actors are equal and seeks to understand the collective effects of changes in the institutional environment on organizational action (c.f. Meyer & Rowan, 1977; Oliver, 1991; Goodstein, 1994, Zajac & Kraatz, 1993). The findings of this study offer a revision to this logic by suggesting that all institutional actors are not equally powerful or important. This is an important extension to the existing logic by suggesting that the institutional environment is not monolithic but, in fact, can and should be considered as independent forces acting upon organizations. By extending the conception of the institutional environment to recognize these separate and independent forces, a deeper understanding of the effects of the institutional environment can be developed.

The findings of this study suggest that institutional actors may vary significantly in terms of the importance and power they exert on organizations. In fact, actor power may depend upon the context. Specifically, the findings of this study imply that the power of various actors may depend upon the level of consensus surrounding the issue at hand. In other words, where no one questions the validity of the practice in question, governmental policies and support may be sufficient to ensure diffusion (Tolbert & Zucker, 1983; DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Oliver, 1991; Jennings & Zandbergen, 1995). However, when there is less consensus on the definition and severity of the issue, firms may respond by attending to customer preferences and reputational concerns (Kraatz & Zajac, 1996; Elsbach, 1994; Elsbach & Sutton, 1992).

At times of flux, public opinion and industry attention may become pre-eminent, whereas when there is clear consensus, the government's position may become predominant. Generally, this suggests that an actor's power in a given situation depends upon the context or, more specifically, consensus.

Future research should explore this idea of relating societal consensus to power by examining the effects of other social movements on organizational behavior. For example, the anti-apartheid and civil rights movement could be contrasted. The anti-apartheid movement appeared to have wide-spread public support and little governmental support. Yet it achieved significant changes in both organizations (through disinvestment in financially successful companies) and society (by precipitating the end of apartheid). On the other hand, the civil rights movement in the United States has successfully used governmental and public support to achieve organizational and societal changes. By exploring two movements simultaneously we may better understand the role of consensus in creating actor power and ultimately organizational change.

Most generally, the findings of this study suggest that institutional environments may not be monolithic as has been previously assumed. In fact, the results suggest that institutional forces exert different and independent effects on organizations. Future research should develop this idea by exploring the conditions under which various institutional forces gain and lose influence.

The Role of Direct Governmental Coercion. The finding that direct governmental pressures were not clearly associated with organizational change also provides some interesting insights to the role of punishment on organizational behavior.

The findings indicate that, while the target organizations (those that directly experience or report experiencing fines and pending fines) were not more likely to implement changes in response to direct institutional pressures, increased prosecutions by the EPA were associated with greater organizational change. While punishment may not engender organizational action in the punished organization, it does appear to have some social effect on by-stander organizations. In research on the social consequences of punishment of individuals within organizations, Trevino and her colleagues (Trevino, 1992; Trevino & Ball, 1992) found that punishment had positive effects on by-standers. Similarly, it appears that executives learn from the punishment experiences of other organizations. In this light, the social implications of failing to punish wrong-doing at the firm level may have greater effects on by-stander organizations than on the target organization.

This finding suggests that organizations learn about their environments both directly through their own experiences and indirectly by observing the experiences of others. Previous research on institutional theory has primarily focused on the effects of direct learning on organizational actions (c.f. Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Goodstein, 1994; Elsbach & Sutton, 1992; Elsbach, 1994; Zajac & Kraatz, 1993). In general, this literature suggests that, as organizations experience institutional pressures, they will respond by changing their behaviors and/or structures. Thus, learning occurs through the firm's direct experiences with its environment. However, the findings in the present study suggest that indirect or social learning (Bandura, 1977; 1986) may also affect organizational actions. Organizations attend to the actions and consequences of other relevant organizations and shape their behaviors in response.

It is important to note that the findings in this study suggest that organizations are not simply imitating the successful strategies of their peers as mimetic isomorphism implies (DiMaggio & Powell, 1983), but that they are also learning from the negative experiences of others. In other words, vicarious punishment (Bandura, 1977, 1986) appears to influence organizations in much the same way as it influences individuals. Vicarious punishment suggests that individuals adjust their behaviors after witnessing others being punished (Bandura, 1986). Apparently organizations also experience punishment vicariously and make behavioral changes as a result.

Considered theoretically, this expands our previous understanding of how firms experience their environments. It appears that organizations learn from their environments both directly through their own experiences and indirectly by witnessing the positive and negative experiences of relevant others. This finding has potentially important implications for theory as previous research has suggested that social learning accounts for a significant proportion of individual learning (Bandura, 1977, 1986). If the same holds true for organizations, this may provide important insights into how organizations experience and respond to their environments.

Future research should examine the role of indirect or social learning on organizational actions. Specifically, the conditions under which social learning is most likely to occur need to be specified. For example, previous research has suggested that perceived justice influences how by-standers interpret individual punishment (Trevino, 1992; Trevino & Ball, 1992). Similar sense-making may occur at the organizational level. Further, individual level research has suggested that the severity of the punishment also influences individual reactions (Trevino, 1992; Trevino & Ball, 1992; Ball, et al.,

1994). Similar issues may be at work at the organizational level with perhaps larger or more socially significant firms having a more substantial impact on the observing firms' response (Fiske & Taylor, 1991, p. 248-252).

The Internal Environment

The Role of Structural Inertia. Another unexpected finding was that larger organizations were associated with greater incidence of response. This finding runs counter to traditional structural inertia arguments (Hannan & Freeman, 1977, 1984; Stinchcombe, 1965). In this study size did not create an impediment to responses but was in fact associated with greater response. It is tempting to attribute this association to resource availability. Logically, larger organizations would have greater resources and therefore, greater abilities to finance these changes. However, both the long and short term measures of financial slack were unassociated with organizational response.

Another way to interpret this finding is that larger organizations are more visible within the organizational field. Research on individual-level attention suggests that the experience of being unique or simply the feeling that one is somehow different and, as a result, more conspicuous than one's peers can cause that individual to change behavior (Fiske & Taylor, 1992, p. 247-254; Kanter, 1993, p. 206-242). The findings in this study may suggest a similar phenomenon at the organizational level. Large organizations may respond because they are being watched or simply expect that they may be watched.

Interestingly, there appears to be a social or by-stander effect of visibility. The logic for this association at the individual level is based on attention as a part of the process of cognition. Individuals appear to notice and attend to visible phenomena

(visible phenomena are somehow unique or unexpected in a given context). This visibility then creates importance or salience. The salience in turn creates influence such that others attribute or credit solos (visible individuals) with having greater influence over group experiences than other group member (Fiske & Taylor, 1992, p. 248-250; Taylor, 1981; Taylor, Fiske, Close, Anderson, & Ruderman, 1977; Kanter, 1993, p. 206-242). Therefore, visible people are seen by observers as intrinsically influential.

Thus, large organizations may change because they are or perceive that they are more visible (either through media attention, advocacy group attention, public notice, or the EPA). This visibility motivates action in both themselves and, perhaps, other firms. Quite unlike the liability of size, there appears to be a positive effect of size on organizational change in that it positively shapes both the target and bystanders' behaviors.

Considered in conjunction with the previous findings on coercion, this finding may provides important insights into the process of indirect learning in organizations by beginning to specify which organizations within a field are relevant. The results of this study suggest that organizations attend closely to the negative experiences of their larger peers. Therefore, the visibility of large organizations may not only shape their actions but also the actions of by-stander organizations.

Future research should look to develop the role of social learning in organizational actions by further specifying which organizations within a field are influential and why. For example, media attention may influence visibility and ultimately over-ride the effects of size in creating influence.

Taken together, the findings in this study present an interesting answer to the research question, under what conditions do organizations respond to social movements? The results indicate that both public involvement in the environmental movement and industry attention to the environmental movement are associated with increased organizational action. Organizations respond when certain actors in the institutional environment (public support and industry attention) expect it. Further, the results indicate that there is no liability to size and, in fact, larger organizations were more likely to respond. Together this suggests that both the firm's social environment and its position within that environment influence organizational response.

The findings also suggest that visible phenomena are attended to. The findings suggest that, as the visibility of the environmental movement increased, in terms of public support and in terms of industry attention, firms responded to the movement. Further larger organizations, which one could argue are more visible themselves, were more likely to respond to changes in their social environment. These findings raise some interesting implications. First, they suggest that organizations are more socially attuned than previously expected. And, secondly, considered in conjunction with the finding that previous fines and pending litigation did not influence organizational behavior, they suggest that certain types of visibility matter. It appears that visibility matters more than direct negative experience with the environment (fines, pending cases) in shaping organizational behavior. Future research should further explore the impact of visibility on organizational behavior by integrating the effects of other media (for example, television, popular periodicals and influential newspapers) on organizational responses. Further, it would be interesting to explore the impact of organizational experiences

further. For example, are firms whose misconduct is reported in the public media more likely to respond to calls for action than firms whose misconduct is not known? Further research is needed to understand and flesh-out the impact of visibility on organizational actions.

Practical Implications

The study findings suggest that social movements do indeed influence organizational actions. Organizations in this study acted in response to increased social activism, industry attention to the environmental movement and EPA prosecutions. This suggests that the contemporary environmental movement has begun to influence society. This is an interesting finding as research has generally neglected the consequences of social movements (Andrews, 1997; McAdam, McCarthy, & Zald, 1988, p.728; Tarrow, 1994, p. 170; Burnstein, Einwohner, & Hollander, 1995). Future research should expand on this finding by examining both the consequences of firm responses on environmental health and the effects of other social movements on organizational performance.

From a policy making perspective, the results of this study also have important implications. The findings presented here provide support for the notion that organizational response is facilitated by the visibility of social issues. Organizations appear to be sensitive to the consensus that is created around an issue when attention is high. Therefore, individuals who want to facilitate change need to become involved in and publicize the issue they advocate.

Further, it also appears that organizations are influenced by the consequences of both action and inaction. Most specifically, it appears that organizations watch and learn from the experiences of other relevant organizations, especially large organizations. While negative consequences (in terms of fines or pending cases) did not appear to influence the target organization, overall increased activity by the EPA (total prosecutions in the environment) did appear to have a positive effect on by-stander organizations. The decision to enforce or not enforce current legislation appears to have broader effects than perhaps was intended. While enforcement does not influence the target in the expected ways, it does appear to influence the entire organizational field.

Taken together, this study provides two lessons for policy makers. First, public involvement and building consensus around issues is critical to creating organizational response. And, second, enforcing real organizational consequences is important.

This raises the question of what this study means for managers. Most generally, the results of this study suggest that social and political pressures influence organizational actions despite organizational constraints. Organizations are not exclusively economic beings motivated by economic concerns but are social beings as well, influenced by and influencing society at large. This is a broader view of the role of the organization than is conventionally offered.

Limitations

This study has several limitations. First, the firms in this study were all large publicly owned and traded *Fortune* 500 companies. Although every effort was made to ensure that the sample reflected the population of *Fortune* 500 organizations, clearly there

were limitations. As such it is unknown how these results will generalize to the broader population of organizations within other ownership contexts and sizes.

Secondly, as a two industry study it is somewhat limited in its ability to generalize to other contexts. Specifically, the firms in this study were all in extractive industries (those dependent upon the natural environment for their raw material inputs). It is unknown how this may have affected the study outcomes.

Finally, both of these industries market their end-products directly to the public. An argument could be made that this relationship makes them more likely to attend to public concerns since they can be viewed by the firm as customer concerns. It is unknown how this relationship may have influenced the results. Future research can better assess and refine these findings by exploring other industries and larger cross sections of organizational types.

Conclusion

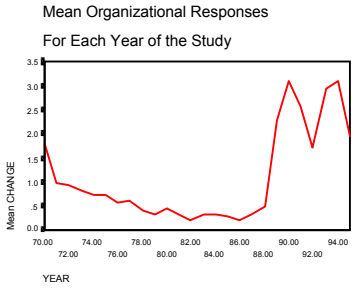
Social movements have become an increasingly prevalent aspect of American society (Macionis, 1995). Organizations have distinguished themselves both by their willingness to respond to these movements and their reluctance to do so. This wide range of responses raises the question, under what conditions do firms respond to social movements?

The results of this study suggest that public support and industry attention to the movement facilitate organizational action. Contrary to expectations, direct governmental coercion had little influence over organizations. These results offer several implications for theoretical development. First, they suggest that contrary to conventional assumptions

institutional environments are not monolithic in terms of their influence over firms. Different institutional forces appear to exert different pressures on firms. This suggests that institutional environments may be more complex than previously expected. Second, the results failed to support the notion that the government can force action. This suggests that the real power to facilitate organizational action and social change may lie in public acceptance and visibility of social concerns. These findings provide the basis for future examinations and explanations of this complex phenomenon.

Figure 1

Organizational Responses for Each Year of the Study



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Appendix A

Sampling Frame and Screens

FOREST PRODUCTS FIRMS (SIC code 26)

Firm Name	Sales	Domestic	Data Availability
Notes			
International Paper *	Y	Y	1970 - 1995
Boise Cascade *	Y	Y	1970 - 1995
US Plywood-Champion	N	-	1970 - 1971
Georgia Pacific *	Y	Y	1970 - 1995
Weyerhaeuser *	Y	Y	1970 - 1995
Mead *	Y	Y	1970 - 1995
Crown Zellerbach *	Y	Y	1970 - 1985
1986 acquired by Mead			
Kimberly Clark *	Y	Y	1970 - 1995
St. Regis Paper *	Y	Y	1970 - 1984
1985 acquried by Champion			
Scott Paper *	Y	Y	1970 - 1995
Union Camp *	Y	Y	1970 - 1995
Westvaco *	Y	Y	1970 - 1995
Hammermill Paper *	Y	Y	1970 - 1985
1986 acquired by Forstmann-Leff Associates			
Potlatch Forest *	Y	Y	1970 - 1995
1973 name change Potlatch Forest			
Hoener Waldorf *	Y	Y	1970 - 1975
1977 acquired by Champion International			
Southwest Forest Industries *	Y	Y	1972 - 1986
1987 purchased by Stone Container			
Riegel Paper *	Y	Y	1970 - 1971
1972 purchased by Federal Paperboard			
Federal Paperboard	Y	N	1970 - 1995
Triangle Pacific Forest Products	N	-	1971 - 1985
Consolidated Papers	Y	Y	1994 - 1995
Missing Data			
Longview Fibre *	Y	Y	1988 - 1995
1989 incorporated			
Fort Howard Paper *	Y	Y	1973 - 1987
1988 privately held			
Hudson Pulp & Paper	-	-	Not Available
Southland Paper Mills	-	-	Not Available
Chesapeake Corp of Virginia *	Y	Y	1970 - 1995
1984 Name Change: Chesapeake Corp			

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* Indicates accepted into the sample; N=no, Y=yes

Appendix A

Sampling Frame and Screens

FOREST PRODUCTS FIRMS (SIC code 26)

Firm Name	Sales	Domestic	Data Availability
Notes			
Champion International *	Y	Y	1970 - 1995
Jim Walter	N	-	1971 - 1986
Missing Data			
Container Corporation	-	-	1972
Missing Data			
Diamond International *	Y	Y	1970 - 1981
1982 purchased by Sir James Goldsmith			
Evans Product	N	-	1970 - 1984
1985 Chapter 11 Bankruptcy			
Great Northern Nekoosa *	Y	Y	1970 - 1988
1990 purchased by Georgia Pacific			
Bemis *	Y	Y	1970 - 1995
Willamette Industries	-	-	Not Available
Saxon Industries *	Y	Y	1970 - 1980
1982 Chapter 11 Bankruptcy			
Louisiana Pacific	N	Y	1973 - 1995
1972 spin off from Georgia Pacific			
Inland Container *	Y	Y	1970 - 1977
1978 acquired by Time Inc.			
Nashua *	Y	Y	1970 - 1995
Masonite	-	-	Not Available
Olinkraft *	Y	Y	1974 - 1977
1974 spin off from Olin;			
1979 acquired by Johns-Manville Corp			
Avery International	N	-	1970 - 1989
Maryland Cup	N	-	1970 - 1982
Fibreboard	N	-	1970 - 1989
Stone Container *	Y	Y	1970 - 1995
Sunoco Products	-	-	Not Available
Alton Box Board	-	-	Not Available
Georgia Kraft	-	-	Not Available
Edward Hines Lumber	-	-	Not Available
Greif Brothers	-	-	Not Available
Pacific Lumber	N	-	1975 - 1984

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* Indicates accepted into the sample; N=no, Y=yes

Appendix A

Sampling Frame and Screens

FOREST PRODUCTS FIRMS (SIC code 26)

Firm Name	Sales	Domestic	Data Availability
Notes			
Brunswick Pulp & Paper	-	-	Not Available
APL	N	-	1973 - 1985
National Homes	N	-	1970 – 1995
Overhead Door	N	-	1976 – 1988
1982 Name Change to Dallas Corp.			
Bohemia	-	-	Not Available
Tampax	-	-	Not Available
Dennison Manufacturing	N	Y	1970 - 1989
Keyes Fibre	-	-	Not Available
Rexham *	Y	Y	1972 - 1986
1987 acquired by Bowater Industries			
Papercraft	N	-	1970 - 1984
Pope & Talbot *	Y	Y	1972 - 1995
PH Glatfelter	-	-	Not Available
James River Corp. of Virginia *	Y	Y	1980 - 1995
Missing Data			
Pentair	-	-	1995
Missing Data			
Clevepak	N	-	1976 - 1985
1986 acquired by Madison Management			

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* Indicates accepted into the sample; N=no, Y=yes

Appendix A

Sampling Frame and Screens

1985 acquired by Signal Corp.

Investment in Oil and Chemicals

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* Indicates accepted into sample

Appendix A

Sampling Frame and Screens

OIL & PETROLEUM FIRMS (SIC codes 29 & 13)

Firm Name	Sales	Domestic	Data Availability
Notes			
Mobil Oil	Y	N	1970 - 1995
Texaco *	Y	Y	1970 - 1995
Gulf Oil *	Y	Y	1970 - 1982
1985 acquired by Gulf Corp.			
Investment in Oil & Chemicals			
Standard Oil of Indiana *	Y	Y	1970 - 1995
1985 Name Change: Amoco			
Standard Oil of California *	Y	Y	1970 - 1995
1984 Name Change: Chevron			
Shell Oil *	Y	Y	1970 - 1984
1985 acquired by Royal Dutch Petroleum			
Atlantic Richfield *	Y	Y	1970 - 1995
Continental Oil	Y	N	1970 - 1978
1979 Name Change: Conoco			
Tenneco	Y	N	1970 - 1995
Occidental Petroleum *	Y	Y	1970-1995
Phillips Petroleum *	Y	Y	1970 - 1995
Union Oil of California *	Y	Y	1970 - 1995
1983 Name Change: Unocal			
Sun Oil *	Y	Y	1970 - 1995
1975 Name Change: Sun Co.			
Ashland Oil *	Y	Y	1970 - 1995
Investment in Oil and Chemicals			
Standard Oil of Ohio *	Y	Y	1970 - 1986
1987 acquired by British Petroleum			
Getty Oil	N	-	1970 - 1982
Marathon Oil *	Y	Y	1970 – 1980
1981 acquired by US Steel			
Commonwealth Oil Refining *	Y	Y	1970 - 1977
1978 Chapter 11 Bankruptcy			
Universal Oil Products *	Y	Y	1970 - 1980
1979 acquired by Signal Corp.			
Clark Oil & Refining *	Y	Y	1970 – 1980
1979 sold domestic operations			

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* Indicates accepted into sample; N=no, Y=-yes

Appendix A

Sampling Frame and Screens

OIL & PETROLEUM FIRMS (SIC codes 13 & 29)

Firm Name	Sales	Domestic	Data Availability
Notes			
Tesoro Petroleum *	Y	Y	1970 - 1995
Quaker State Oil *	Y	Y	1970 - 1995
1987 Name Change: Quaker State Corp			
Superior Oil *	Y	Y	1970 - 1982
1984 acquired by Mobil Corp			
Apco Oil	-	-	Not Available
Belco Petroleum	-	N	1970 - 1982
Exxon	Y	N	1970 - 1995
1970: Standard Oil of New Jersey			
Cities Service	Y	Y	1970 - 1981
1988 Name Change: Oxy Oil & Gas USA; Missing Data			
Amerada Hess *	Y	Y	1970 - 1995
Kerr McGee *	Y	Y	1970 - 1995
Investment in Oil and Chemicals			
Charter	N	-	1973 - 1991
American Petrofina	-	-	Not Available
Murphy Oil *	Y	Y	1970 - 1995
Crown Central Petroleum	Y	Y	Not Available
Missing Data			
Oil Shale	-	-	Not Available
United Oil Refining *	Y	Y	1970 - 1980
1981 bankrupt			
Midland Cooperative	-	-	Not Available
Earth Resources	-	-	Not Available
Bird & Son	-	-	Not Available
Edgington Oil	-	-	Not Available
Holly	-	-	Not Available
OKC *	Y	Y	1975 – 1980
1980 liquidation of company			
Pacific Resources	Y	Y	1983 - 1987
1989 acquired by Broken Hill Property			
Tosco	Y	Y	1979 - 1995
1970 Name Oil Shale Corp; Missing Data			
National Cooperative Refinery	-	-	Not Available

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* Indicates accepted into sample; N=no, Y=-yes

Appendix A

Sampling Frame and Screens

OIL & PETROLEUM FIRMS (SIC codes 13 & 29)

Firm Name	Sales	Domestic	Data Availability	Notes
EDG	-	-	Not Available	
Louisiana Land & Exploration *	Y	Y	1970 - 1995	
Diamond Shamrock *	Y	Y	1970 - 1995	
Agway	-	-	Not Available	
Dorchester Gas	-	-	Not Available	
Marion	N	-	1971 - 1994	
Howell	Y	Y	1980 – 1995	Missing Data

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* Indicated accepted into sample; N=no, Y=yes

Appendix B

Sample Profile

	Forest Products	Oil & Petroleum	Total Firms
Population Of Firms in Industries	64	51	115
SIC Sales Screen Rejections	14/64=22%	3/51=6%	17/115=15%
Domestic Screen Rejections	1/64=2%	5/51=10%	6/115=5%
Missing Data Rejections	18/64=28%	17/51=33%	35/115=30%
Total Number Firms Rejected From Sample	33/64=52%	25/51=49%	58/115=50%
Final Sample	31	26	57
Firms Accepted Into Sample	31/64=48%	26/51=51%	57/115=50%
Sample Firms Death During Study	13/31=42%	10/26=38%	23/57=40%
Sample Firms Survive Until 1995	18/31=58%	16/26=62%	34/57=60%
Sample Industry Representation	31/57=54%	26/57=46%	

Appendix C

Statistical Power Analysis

	Small Effect (.02)*	**Medium Effect** (.15)	**Large Effect** (.35)
Sample size (N)	1482	1482	1482
Alpha	.05	.05	.05
Number of Variables (u)	18	18	18
V=N-u-1	1463	1463	1463
lamda	.02(1482)=29.64	.15(1482)=222.3	.35(1482)=518.7
power@	. 99	.99	.99

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* Small, medium, and large effect size calculated following Cohen (1988, p. 413-414).

@ Power determined following tables in Cohen (1988, p. 420-423).

Appendix D

Distribution of Organizational Responses by Organization by Year

Firm ID	70	71	72	73	74	75	76	77	78	79	80	81	82	83
1	2	1	0	2	0	1	3	1	1	0	2	0	0	1
2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
3	3	7	1	1	0	0	0	1	-1	0	1	0	0	1
4	1	1	1	0	0	1	0	3	0	0	0	1	1	0
5	5	1		0	1	1	0	0	1	0	0	0	0	0
6	2	3	2	2	1	0	0	0	0	0	1	0	0	0
7	0	1	0	1	0	3	1	1	0	1	1	0	0	0
8	2	0	1	0	0	2	0	2	0	0	0	0	0	0
9	3	2	0	2	2	1	1	0	0	1	0	0	0	0
10	4	2	3	4	1	1	1	3	0	0	0	1	0	0
11	6	4	2	0	0	1	3	4	5	2	3	1	0	7
12	0	0	0	1	1	1	1	1	1	1	0	0		
13	1	1	0	0	0	0	1	0	1	0	0	0	1	0
14	0	0	3	1	4	2	X	X	X	X	X	X	X	X
15	X	X	1	1	0	0	0	0	0	0	0	0	0	0
16	3	0	X	X	X	X	X	X	X	X	X	X	X	X
17	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	0	3	0	1	0	1	0	0	0	0	0	0	1	0
19	5	0	2	2	0	2	2	1	1	3	4	0	0	0
20	2	1	0	3	0	0	0	0	0	0	0	0	0	1
21	2	1	3	0	2	0	0	1	0	1	0	0	X	X
22	0	0	0	2	2	1	0	1	1	0	0	0	0	0
23	3	1	0	0	1	0	0	0	0	0	0	0	0	0
24	0	0	2	0	0	0	0	0	0	0	1	X	X	X
25	3	0	0	5	1	1	5	0	X	X	X	X	X	X
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	X	X	X	X	0	0	0	0	X	X	X	X	X	X
28	2	1	0	1	0	0	0	2	2	1	0	2	0	0
29	0	0	0	0	0	0	1	0	0	0	0	0	0	0
30	X	X	0	1	0	1	0	0	0	0	0	1		0
31	X	X	X	X	X	X	X	X	X	X	0	0	0	0

Blank cell = missing data
X = firm is not in business
Firm ID's 1-31 are the forest product firms; Firm ID's 32-57 are the oil firms

Appendix D

Distribution of Organizational Responses by Organization by Year

Firm ID	84	85	86	87	88	89	90	91	92	93	94	95		Sum
1	1	0	0	0	0	2	0	5	6	8	4	9		49
2	1	0	0	0	0	0	0	1	0	3	3	0		10
3	0	0	0	1	0	0	7	3	3	3		5		36
4	0	0	0	0	3	2	0	0	1	3	4	0		22
5	0	0	0	0	0	4	2	1	0	6	1			23
6	0	0	X	X	X	X	X	X	X	X	X	X		11
7	0	0	1	0	2	0	2	-1	0	6	2	0		21
8	X	X	X	X	X	X	X	X	X	X	X	X		7
9	3	0	0	0	0	0	0	2	1	1	0	0		19
10	0	0	0	1	0	0	5	2	11	6	1	3		49
11	2	4	0	0	0	14	4	4	2	4	44	5		121
12		0	X	X	X	X	X	X	X	X	X	X		7
13	0	0	2	0	0	2	2	1	0	1	0	0		13
14	X	X	X	X	X	X	X	X	X	X	X	X		10
15	0	0	0	X	X	X	X	X	X	X	X	X		2
16	X	X	X	X	X	X	X	X	X	X	X	X		3
17	X	X	X	X	X	X	X	X	X	X	X	X		0
18	0	0	0	X	X	X	X	X	X	X	X	X		6
19	1	0	0	3	0	5	2	1	1	4	0	0		39
20	0	0	0	0	0	5	3	1	2	5	13	3		39
21	X	X	X	X	X	X	X	X	X	X	X	X		10
22	0	0	0	0	0	X	X	X	X	X	X	X		7
23	0	0	0	0	0	0	2	2	0	0	0	0		9
24	X	X	X	X	X	X	X	X	X	X	X	X		3
25	X	X	X	X	X	X	X	X	X	X	X	X		15
26	0	0	0	0	0	0	0	0	1	0	2	0		3
27	X	X	X	X	X	X	X	X	X	X	X	X		0
28	0	0	0	0	0	2	7		1	4	4	2		31
29	0	0	0	X	X	X	X	X	X	X	X	X		1
30	0	0	0	0	0	0	0	0	0	0	0			3
31	1	0	0	2	0	0	4	26	5	7	19	0		64

Blank cell = missing data
X = firm is not in business
Firm ID's 1-31 are the forest product firms; Firm ID's 32-57 are the oil firms

Appendix D

Distribution of Organizational Responses by Organization by Year

Firm ID	70	71	72	73	74	75	76	77	78	79	80	81	82	83
32	1	3	6	3	4	2	0	0	0	2	0	0	0	1
33	2	1	1	3	1	0	3	0	0	0	0	2	2	X
34	3	1	1	1	1	0	2	1	2	0	1	1	1	0
35	2	2	0	2	1	5	0	2	0	0	2	1	1	2
36	4	2	6	2	4	5	0	2	1	0	0	0	0	0
37	2	1	3	4	3	1	1	1	6	0	2	0	0	0
38	0	1	2	0	0	0		0	0	0	0	3	0	0
39	3	0	0	1	1	0	0	2	0	2	0	0	0	0
40	2	1	0	0	0	1	4	1	0	0	1	0	2	0
41	0	1	0	1	2	0	0	0	0	0	0	0	0	
42			1	0	1	0	2	0	0	0	0	0	0	0
43	2		1	0	0	0	0	0	0	0	0	0	0	0
44	2	0	2	0	0	0	0	3	0	0	0	X	X	X
45	1	1	0	0	1	0	0		X	X	X	X	X	X
46	1	2	0	0	0	1	0	0	X	X	X	X	X	X
47	1	0	0	0	1	0	1	0	0	0	0	X	X	X
48		0	0	0	0	0	0	0	0	0	0	0	0	0
49	0		0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	1	0	0
51	6	0	1	0	1	2	0	0	0	0	2	0	0	0
52	1	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	1	2	0	0	0	1	0	0	X	X	X
54	X	X	X	X	X	0	0	0	0	0	0	X	X	X
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	2	0	0	1	0	0	0	0	0	1	0		0	0
57	0	0	0		0	0	0	0	0	0	0	0	0	X

Blank cell = missing data
X = firm is not in business
Firm ID's 1-31 are the forest product firms; Firm ID's 32-57 are the oil firms

Appendix D

Distribution of Organizational Responses by Organization by Year

Firm ID	84	85	86	87	88	89	90	91	92	93	94	95		Sum
32	0	0	0	0	1	3	3	1	2	5	0	4		41
33	X	X	X	X	X	X	X	X	X	X	X	X		15
34	1	2	1	6	3	5	9	6	3	2	3			56
35	0	3	1	0	1	5	6	9	4	7	4	3		61
36	X	X	X	X	X	X	X	X	X	X	X	X		26
37	0	0	0	0	0	6	7	4	6	3		1		51
38	0	0	0	0	0	1	1	1	0	1	4	5		19
39	0	0	0	0	1	6	4	6	4	5	6	6		47
40	1	0	2	0	1	4	3	4	1	1	0	0		29
41	0	0	0	0	0	2	1	1	1	6	2	2		19
42	0	1	0	0	3	3	3	6	0	3	0	3		26
43	0	0	1	X	X	X	X	X	X	X	X	X		4
44	X	X	X	X	X	X	X	X	X	X	X	X		7
45	X	X	X	X	X	X	X	X	X	X	X	X		3
46	X	X	X	X	X	X	X	X	X	X	X	X		4
47	X	X	X	X	X	X	X	X	X	X	X	X		3
48	0	0	0	0	0	0	2	1	0	3	0			6
49	0	0	0	0	0	1	2	0	0	0	0	3		6
50	0	0	0	0	1	1	9	0	0	1	0	0		13
51	0	2	0	0	0	0	5	3	2	2	1	0		27
52	0	0	0	0	0	0	0	0	0	0	0	0		1
53	X	X	X	X	X	X	X	X	X	X	X	X		4
54	X	X	X	X	X	X	X	X	X	X	X	X		0
55	0	0	0	0	0	2	4	0	0	0	0	0		6
56		0	0			4	4	0	0	0	0	0		12
57	X	X	X	X	X	X	X	X	X	X	X	X		0

Blank cell = missing data
X = firm is not in business
Firm ID's 1-31 are the forest product firms; Firm ID's 32-57 are the oil firms.

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